Providing Process Guidance on the Web

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What Is a Process?

process n. a logical organization of people, technology, and practices into work activities designed to transform information, materials, and energy into a specified end result.

Value of input + Value of output

Information + materials + energy

Specified end result

is greater than

Adapted from Quality Process Management, by Gabriel Pall, 1987

Problem Statement

People participating in complex processes generally need information and guidance to successfully perform their roles and responsibilities.

Although most organizations already have process documents intended to provide such guidance, these documents often
• fail to meet the needs of their intended users
• are not kept up to date
• go unused

Much existing software process documentation appears to be deficient in both form and content.
Typical Current On-Line Practice

Many organizations are placing their process documentation on the Web, but
- this usually entails simply making their pre-existing documentation accessible on an intranet
- it generally does nothing to ameliorate the documentation's deficiencies in form and content
- this does help with accessibility and ease of update
- there is potential for much greater improvement

Our Response

Our work entails developing
- information content guidelines and structures
- design and presentation techniques
- example process guides
- supporting technology
aimed at providing effective guidance to process participants.

Our strategy involves two major thrusts:
- incrementally push the technology envelope for electronic process guides (EPGs), while actively taking account of user feedback
- abstract "how-to" knowledge from our experiences and transition that to others
EPG Development Approach

We are undertaking an incremental prototyping approach to developing and refining EPG technology.

We are actively working under a collaborative development agreement for this technology, with the Fraunhofer Institute for Experimental Software Engineering (Kaiserslautern, Germany).

SEI applications are supporting
- other SEI programs
- external organizations

Process Guides (1 of 2)

Structured, reference-style description
Often work-flow oriented
Primary users: process performers
Primary use: enactment support
Can also support training, planning, and assurance
Process Guides

A process guide is a reference "document" for a particular process. Its primary purpose is to support the people who are expected to perform that process.

A process guide should provide an explicit definition of a process that
• applies to its intended operating context
• can be understood, communicated, and followed

Developing Process Guides

A process guide should
• be written as a reference document, not as training
• use graphics, tables, and narrative text
• include examples
• be relevant to the users and tasks

A process guide is generally
• developed by a process engineer during the final stages of process development
• used by a practitioner during enactment of the process
Conceptual Foundations

Our conceptual framework for software processes is based on the things one typically considers when thinking about a software process.

- what happens and how it is done: Activities
- when it gets done: Behavior
- what things are used and produced: Artifacts
- who does it: Agents

EPG Design Principles

Some basic requirements and design principles for electronic process guides (EPGs) are:

- structure and organize information into small, manageable, understandable units ("chunks")
- make extensive use of hyper-links to support flexible navigation through the information space
- present a consistent look and feel throughout the EPG
- integrate use of diagrams, tables, and narrative into an effective user interface
- use current COTS technology for Web applications
EPG Overall Structure

Our EPG prototypes allow direct, symmetrical access to process information by activity, artifact, agent, or behavior. EPGs contain the following window (Web page) types:

- activity
- artifact
- agent
- behavioral diagram
- functional diagram
- glossary
- help
- process explorer

with extensive hyper-link connections among them all.

Selected EPG Pages' Contents (1 of 2)

Activity pages may contain

- context, purpose, objectives, decomposition, task descriptions, tools and techniques, warnings, participants, agent responsibilities,

link to functional diagram, input artifacts (with sources and states), output artifacts (with destinations and states), internal artifacts, link to behavioral diagram, behavior notes, entry/exit criteria, effort guidelines, recommended measures, applicable policies and standards, and concepts and references
Selected EPG Pages' Contents (2 of 2)

Artifact pages may contain
- description, decomposition, flows throughout the process (with sources, destinations, and states), other artifact inter-relationships, storage location, retention period, links to templates, links to examples

Agent pages may contain
- description, activities participated in, table of responsibilities in each activity, and agent inter-relationships

Next Steps in the Prototyping

Better management of process guides:
- generate EPG Web pages from a database containing the relevant process information
- support search and query
- cope with multiple versions of the guide resulting from changes to the process

Personalization of process guides:
- allow personal annotations ("Post-It" notes)
- allow user and project customization of the guide to reflect tailoring, new views, etc.
- offer checklists to track the status of individual instances of the process and its elements
- support role-specific views of the process
Vision for Collaborative Process Guides (CPGs)

Our vision for CPGs has two components, for usage and for evolution, respectively:
- Our vision for the usage of CPGs is that they will provide a process participant with the guidance, and access to the training, needed to most effectively, efficiently, and accurately perform the process components in which that individual has a role.
- Our vision for the evolution of CPGs is that they will be evolved (e.g., initially developed, and then refined, elaborated, tailored, and improved) efficiently, flexibly, and collaboratively.

Usage Vision for CPGs

A CPG will
- make extensive reference guidance readily available, and this guidance can be (at the users' discretion) within the context of the current state of the process being performed
- offer collaborative guidance when needed, e.g., when an unusual or unanticipated situation arises, or if conflict situations arise
- offer convenient, on-demand access to training
- integrate with an "experience factory"
- include active guidance (e.g., anticipatory) and active agents (to locate relevant information)
- etc.
Evolution Vision for CPGs

CPG evolution will
- be very flexible, across
  - a range of definition rigor and thoroughness
  - substantially different amounts of detail
  - behavior ranging from highly disciplined and restrictive to relatively unconstrained
- itself be a collaborative process, involving the process participants in substantial ways
- allow users to build, refine, elaborate, and change process guides — even "on-the-fly"
- incorporate both qualitative and quantitative analyses, including "what if" simulations
- etc.

Towards An Integrated System

In order to fully realize our vision for CPGs, they will form a vital component of an integrated system for supporting collaborative processes. Such a support system would integrate
- CPG technology
- process enactment technology
- collaboration technology
- computer-based training, distance learning, and similar facilities
- process engineering technology
- project management support

This also suggests a strategy for introducing software process technology:
an incremental, evolutionary approach.