# Personal Learning Assistant Agents in the Business Process Domain

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## Abstract

*Each time an employee enters a new business endeavor, he/she is required to learn new tasks and processes. Learning in the workplace can be as simple as learning the task of logging onto your computer and as complex as learning a multi-week business process. Across an enterprise organization, many individuals will be required to learn the same or similar operational processes. Since human beings are unique in there learning styles, it is essential that training techniques be customized to enhance human learning performance across a diverse workforce. Intelligent agents represent an emerging paradigm where adaptive task selection is coupled with autonomous control. Agents represent a promising technology for delivering specialized training to their human counterparts by customizing instructions in multiple modalities. Insight into how an individual learns a specific business process can be used to enhance that business process for the best performance. This paper discusses the rationale for a personal learning assistant agent customized for business processes.*

## 1. Agents, Learning, and Workflow Processes

Intelligent software mechanisms or *intelligent agents* are software entities that have the knowledge of their environment and the innate capability to learn and adapt to their context given external stimuli. Agents are particularly well equipped in this domain because their operations are based on tasks and rules. Tasks can be easily characterized as training steps and rules can represent the conditions by which a training step must be customized and delivered.

At the foundation of agent research [3], agents operations can be governed by using *event*, *condition*, *action* rules (*ECA*). In a training scenario, an *event* can be signified by the initiation of a new training process or the completion of a relevant task. A *condition* of this event can be defined by the context by which it is delivered. The event might be directed to a particular person who has specific training requirements and needs. The existence of this event under certain conditions is the stimuli for an agent to perform some *action*. In the case of training, a subsequent action could be the next training step or task. This notion of training is similar to the notion of *workflow* which is the paradigm by which business process operations are governed. A workflow is defined as the implementation of a sequence of tasks to realize a specific process [1]. Typically, engineers in industry are trained to learn workflow-oriented processes specific to their jobs. In this business domain, it is important that workers both be competent in their work processes but also be consistent in the sequence in which they complete underlying process tasks. Consistency assures quality in the resulting product.

A personal learning assistant agent can integrate business processes with learning processes. With the emergence of agent-mediate business process systems, this is a natural combination. When a learner enters each step within a business process, the agent should be able to provide customized instruction. Having one agent that mediates both learning and workflow process can help to correlate business process performance as a function of how fast workers perform in their individual tasks. Furthermore, an agent can encapsulate both the general business knowledge in addition to the overarching learning objectives. Ultimately, the business processes can be adapted and re-engineered to correspond to the most effective human learning performance.

## 2. Benefits of Business-Oriented Personal Learning Assistant Agents

In addition to the previously mentioned rationale, there are several specific benefits that multiple personal learning assistant agents can contribute to the business process management domain.

- **Human learning profiles across specific demographics.** Agents can infer similarities in learning characteristics based on an employee's role, background, age, sex, or nationality.
- **Integration of Operations and Training Databases.** Agents can help to integrate databases that hold real-time operational information in business process management systems with training material contained in instructional databases.
- **Unbiased evaluation of performance.** Unless programmed to do so, agents can evaluate employees on their performance irrespective of other emotion-driven factors.
- **Developing Enterprise Learning Profiles and Patterns.** Multiple personal learning assistant agents

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can communicate to devise profiles for training specific to a particular or set of business processes.

- **Training in multiple modalities.** An agent can use multimodal interfaces, such as text, voice, and graphics, to provide instructions. Additionally, the agent can customize the mode to particular learning styles as driven by a specific business process.

## 3. Conclusions

The integration of business processes and training processes represents a promising area for agent technology. Future work would be integration of agent techniques in to established learning infrastructures [4]. In addition, current and future work of the author investigates the integration of the training process with agent control [2].

## 4. References


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