Business Processes and Knowledge Work

MSc BIS Module: Business Process Management, SS 2013
Motivation

Knowledge is increasingly used to differentiate physical goods, to diversify them into product-related services and to offer smart services.

Thus, knowledge work and knowledge workers are key to the success of many enterprises and enterprises want to manage knowledge work.

Knowledge work is part of an enterprises processes. One way to improve any form of work is to treat it as a process.

Business Process Management, however, is often regarded as incompatible with the autonomy and work approaches of knowledge workers, because it is associated only with structured processes.

We deal with some issues of managing business processes and knowledge work.
Prof. Dr. Knut Hinkelmann  
MSc BIS

Knowledge Work

Learning Objective

Students …

- can distinguish between different kinds of knowledge work
- are able to apply business process management for knowledge work
- know how to extend business process models with business logic
- know how to capture, elicitate and represent business logic for application and later reuse
- can manage knowledge work in unstructured processes
Some examples of knowledge work

- Decision-Making
  - Making a choice between different alternatives.

- Diagnosis
  - Identification of the nature and cause of anything; (can be a prerequisite for solving a problem)

- Problem Solving
  - Finding solutions to a problem satisfying specified goals

- Design
  - Construction of an artifact (object or a system), satisfying a set of requirements, subject to constraints

- Configuration
  - Special case of design activity, where the artifact being configured is assembled from instances of a fixed set of component types

- Planning
  - Organizing activities to achieve a desired goal
Process Improvement Approaches for Knowledge Work

- Participative, incremental, and continuous process improvement
  - Six Sigma is a good example of such an intervention

- Measurement of knowledge work quality and output is difficult.
  - Assessment of capability maturity can be made, e.g. based on CMMI.

- Process flow should not be the centerpiece of a knowledge work improvement initiative
  - A simpler form of process flow is a checklist of what activities a knowledge worker needs to perform

(Davenport 2010, p. 27ff)
Determining Process Flow

- Business Process is a …

"… planned response to an operational business event …" ¹)

- Typically, different levels of complexity are distinguished
  - Structured processes: Process flow can be planned in advance
  - Knowledge Processes and Projects: Tasks and Process flow are determined only at run-time depending on the concrete situation

¹) J.C. Frazer, cited by (Ross & Lam 2010, p. 72)
Structured Processes vs. Knowledge Processes

**Structured Processes**

- **Characteristics**
  - *Prescribed* process flow
- **Typical objectives of BPM**
  - Efficiency, productivity
  - Traceability
  - Uniformity
  - Automation
- **Process flow defined at**
  - *design time*

**Knowledge Processes/Projects**

- **Characteristics**
  - *Ad hoc* process flow
  - Unforeseeable events
  - High variability
  - Complex tasks
- **Typical objectives of BPM**
  - Flexibility
  - Autonomy of the workers
- **Process flow is determined at**
  - *run time*
Knowledge and Processes

knowledge *about* processes:
- process flow
- roles
- resources

→ process logic

used at *design time*

knowledge *in* processes:
- supports practice
- skills, experiences
- know how

→ business logic

used at *run time*
**Forms of Knowledge / Business Logic**

- **Implicit Knowledge**
  - Tacit knowledge: in heads of people
  - Self-aware knowledge: in heads of people

- **Explicit Knowledge**
  - Documented knowledge: in documents/databases
  - Formal knowledge: program code, knowledge bases

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**People**

**Organisation**

**Information Technology**
Structured Processes vs. Knowledge Processes

- There is no strict separation between structured processes and knowledge processes.
  - Structured processes can contain knowledge work
  - Knowledge processes can contain structured components

Structured processes and knowledge processes can be distinguished by the proportion of process logic and business logic.
Types of Knowledge Workers according to (Davenport 2010)

- **Integration Model**
  - Systematic, repeatable work
  - Highly reliant on formal processes, methodologies or standards
  - Dependent on tight integration across functional boundaries

- **Collaboration Model**
  - Improvisational work
  - Highly reliant on deep expertise across multiple functional areas
  - Dependent on fluid deployment of flexible teams

- **Transaction Model**
  - Routine work
  - Highly reliant on formal rules, procedures and training
  - Dependent on low discretion workforce or automation

- **Expert Model**
  - Judgement-oriented work
  - Highly reliant on individual expertise and experience
  - Dependent on star performers

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(Davenport 2010)
Process-orientation for Knowledge Workers according to (Davenport 2010)

**Transaction workers.** Need to understand the flow of their work and the knowledge needed to perform it, but rarely have time to consult guidelines or knowledge sources. Process flow can be added into IT applications (workflows) bringing required information to the worker.

**Integration workers.** It is possible to articulate the process to be followed, e.g. by "standard operating procedures". Workers typically have enough time and discretion to consult the description.

**Expert workers.** High autonomy and discretion in the work. Expert knowledge work can be improved by providing templates, sample outputs, and high-level guidelines instead of specifying detailed process models.

**Collaboration workers.** If external knowledge and information are necessary to do the job, they must generally be made available through repositories and documents.
Levels of Knowledge Work according to (Brinkley et al 2009)

1. **Expert thinking**: includes solving problems outside of rule-based solutions. As well as high level research and creative work, this might also include the mechanic who is able to identify a solution to a problem that computer based diagnostics could not.

2. **Complex communication**: includes interacting with other people to acquire or convey information and persuading others of their implications, with computers assisting but unlikely to replace – examples might include some managers, teachers and salespeople.

3. **Routine cognitive**: includes mental tasks closely described by rules such as routine form processing, often vulnerable to computerisation.

4. **Routine manual**: includes physical tasks closely described by rules, such as assembly line work, that may be replaced by machines.

5. **Non-routine manual**: includes physical tasks hard to define by rules because they require fine optical or muscle control such as truck-driving and cleaning, unlikely to be replaced by computers.

(Brinkley et al. 2009)
Knowledge Creation, Distribution, and Application

Process orientation differs depending on the knowledge activities involved:

- **Knowledge Creation**
  - Knowledge creation processes can often be decomposed into several pieces or stages, whereby new knowledge evaluates at the transition from one stage to another

- **Knowledge Distribution**
  - An approach to managing knowledge distribution or sharing is not to manage the process itself, but rather the external circumstances

- **Knowledge Application**
  - Apply existing knowledge to familiar or unfamiliar situations
  - Improve performance by reusing knowledge more effectively

(Davenport 2010, p. 22ff)
Knowledge Management and Business Processes

- Business Process Management deals with process logic
- Knowledge Management mainly deals with business logic (know how). Different kinds of knowledge activities
  - Creation
  - Distribution/Sharing
  - Application/(Re-)Use
  - Capturing
  - Preservation
  - Identification

- Capturing, sharing and applying knowledge can be a contribution also to process improvement – leading to better results of knowledge-intensive tasks
Process versus Practice in Knowledge Work

- Davenport distinguishes between process and practice
  - **Process** – the design for how work is to be done
    - Process Logic
  - **Practice** – an understanding of how individual workers respond to the real world of work and accomplish their assigned tasks
    - Business Logic

- This roughly corresponds to the distinction between "flow" and "know"
  - "flow" is the process flow
  - "know" is the execution of individual tasks (practice)

(Davenport 2010, p. 22ff)
Representations of Process, Business and Data Logic

Process Logic
- Process model (e.g. BPMN)
- Executable process model – workflows (e.g. via XPDL)
- Java Code

Business Logic
- Documents
- Checklists/guidelines
- Use cases
- Decision tables/decision trees
- Rule families
- Production rules
- Java Code

Data Logic
- Logical data model (e.g. via UML)
- Physical data model (e.g. via SQL)

adapted from (Küng 2010)
Outlook

From the distinction of process and practice, we will deal with two approaches for knowledge work:

- **Decision Model**: Combining Business Processes and Business Logic
  - "Separate the know from the flow"
  - Start from the process view

- **Adaptive Case Management** for ad hoc Business Processes
  - Deal with content-centric, user-driven processes
  - Put content and business logic in the center