

Knowledge Management Can Be Lean: Improving Knowledge Intensive Business Processes

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Background and intention of the study



Research methodology



Case study and findings



Conclusions and outlook

- Knowledge is more and more considered an integral part of the BPs and not something to be managed separately.
- Knowledge is deeply embedded in all types of business processes, even in those that up now have been considered highly repetitive, structured and somewhat “mechanistic”.
- ***Orientation towards value creation as principle also for KM?***

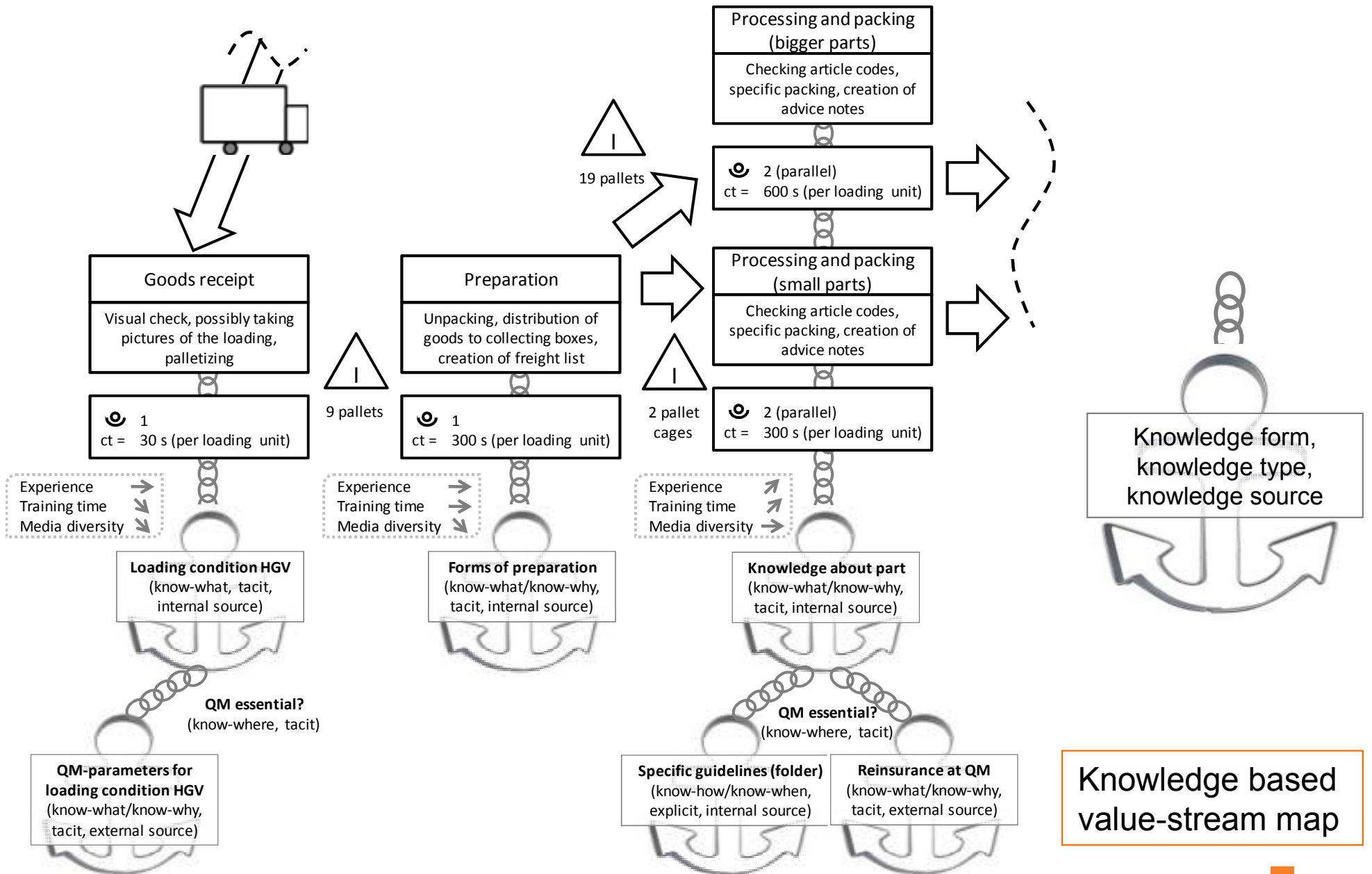
Our research goal:

- 1) Analysing the knowledge dimension of a repetitive, but highly complex business process
- 2) Demonstrating a possible approach to analysing “knowledge-intensiveness” of the chosen process

Methodology: Integrated framework for KM and BPM

	Originating model / framework:	1) Process-knowledge continuum 2) Holistic BPM – 2.1 Strategy; 2.2 People; 2.3 Process component; 2.4 BPM Systems 3) Reverse pyramid – 3.1. Data; 3.2. Information; 3.3. Knowledge; 3.4. Wisdom		
BP Complexity	1	Simple procedural processes	More complex processes	Very complex processes
Main Characteristics	1	Step-by-step sequence; Few rules or decision points; Well defined subject matter	Branching sequence; Many rules or decision points; Less defined subject matter	Sequence defined by process; heuristic and guesses; evolving subject matter
Examples	1	Mfg line; retail sales; book keeping	Equip. Repair; Field sales; Process Analysis	New Product development; S/W system Design; Consulting
Worker Types	1; 2.2	Ordinary workers	Knowledge workers	Experts
Data sources	3.1; 2.4;	Deterministic	User-selected	Require human-expertise
Information type	3.2; 2.4	Predefined; highly structured; coming from BPM, ERP or Workflow systems	Structured and unstructured; Generally similar system sources	Structured/unstructured; Source cannot be predicted in advance;
Types of process-related knowledge	1	Predominantly explicit in the form of process models	Explicit – process models, business rules; Experiential – Exceptions, process-related insights	Predominantly experiential: lessons learned; new practices; tips and hints
Knowledge intensity	1; 3.4	Knowledge is resident in the process model. Data is captured largely by mechanical sensors	Knowledge-intensive processes that require human expertise for completions. Mix of human and mechanical data collection	New combinations of data and information occur frequently through human interpretation
BP Modeling	2.3	Quite detailed	Only High Level	Not advisable
BP improvement methodologies	2.4	Traditional	Knowledge-based	Discovery
BP Automation	2.4	Automated with little human interaction.	Human interaction required at key points.	Not possible
Process-related competitive advantage	2.1	Process efficiency; standardization to minimize variations	Process effectiveness; knowledge processes designed to leverage human knowledge	Expert's knowledge; competitive advantage not achieved through processes but is linked to expert work outcomes
BP performance monitoring	2.1; 2.2.	Measures related to process efficiency and control: cost/time/output/throughput		Measures related to process effectiveness expressed in terms of goals and learning

Excerpt of an exemplary case study: 3 steps of the reverse logistics process



Knowledge intensity of the single process steps

Criteria for knowledge intensiveness	Value for "goods receipt"	Value for "preparation"	Value for "packing"	Value for "processing"
Variability and exceptions	2	3	4	3
Diversity and incertitude of input and output	1	2	3	5
Variety of sources and media	1	1	3	3
Variance and dynamic development	1	2	3	4
Many participants with different expertise	3	1	2	4
High degree of innovation	1	1	3	3
Disposable scope for decision-making and insertion of creativity	2	2	3	4
Complexity of work	1	2	3	4
Degree of singularity (vs. degree of recurrence)	1	2	3	2
Business criticality	2	2	4	5
Required experience	1	2	3	4
Training time	1	2	3	4
Average	1.7	2.2	3.7	4.5
Rating	Less knowledge intensive	Less knowledge intensive	Strongly knowledge intensive	Strongly knowledge intensive

Items have been scored on a 5-step Likert scale

Analysis of the task „Goods receipt“

Criterion	# 1	# 2	# 3	Description
Main Characteristics	X			Step-by-step sequence, few decision points, well defined subject matter
Worker Types	X			Mostly blue-collar workers
Data sources	X			Deterministic (perception of the truck, rules & manuals, personal experience, known experts)
Information Type		X		Structured and unstructured (rules and experience)
Types of process-related data		X		Predominantly business rules, also experiential lessons
Knowledge Intensity	X			Process step requires some human expertise (see slide before)
BP Modelling	X			Detailed modelling is possible; a value stream model is existing
BP Improvement Methodologies				(The intention of the case was to improve the process in terms of knowledge management)
BP Automation		X		Process is not automated; human interaction is required at key points (decision making)
Process-related competitive advantage	X	X		Process efficiency (process time) as well as process effectiveness (minimal or no wrong decisions)
BP performance monitoring	X			Process efficiency control: Time; process effectiveness: number of complaints / disruptions in later processes

The process step itself is less knowledge intensive & not really complex

Yet human interaction and decision are necessary

Suggestion: Use of traditional methods for process improvement for some its aspects, rather than the entire process → Lean management approach possible

→ Scanning the process steps for waste

→ Optimising by standardising the process steps

→ Codifying and visualising the explicit knowledge relevant for each step

→ Elimination of external information not required for decision making

Practical execution: Elimination of twin knowledge anchors by simply developing and installing explicit pictured decision guidance for the acceptance of trucks, thus avoiding the need for going back on external knowledge sources.

Outcome: Reduced cycle times and process costs

- Clear link between improved decisions and improved processes could be shown
- The integrated framework as a comprehensive approach for analysing the knowledge component of business processes
- Operationalisation of the criteria of this model:
 - Methodology for determining a process' knowledge intensiveness has been introduced
 - Further research is needed in order to operationalize the other criteria and confirm their applicability in practice
- BPM researchers are prompted to focus on decision and improved decision-making support as an important aspect of BP improvement

Conducting the Case Study: Data collection

Used instruments for data collection:

- Knowledge based value-stream mapping
 - Structured interviews with process owners
 - General observation of the process
 - Detailed observation and questioning
 - Semi-structured interviews with operating personnel
- Refining the methodology by analyzing a pilot case

Examination of 14 processes in seven locations of the logistics service provider

- Analysis of the cases separately and as a whole to find out the most important influences

- A. Sequencing car components
- B. Textile distribution logistics
- C. Shipping electronic components
- D. Pre-assembly of car components
- E. Storing of flexible PVC sheetings
- F. Picking powder lacquer
- G. Picking of car components
- H. Repacking of bigger parts (automotive)
- I. Sorting of original parts (automotive)
- J. Sorting/storing of car components
- K. Sorting/shipping of car components
- L. Repacking of smaller parts (automotive)
- M. Manufacturing logistics for automotive supplier
- N. Reverse Logistics**