Managing Flow Processes in Lean Software Development Practices

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1. Objective
   - To understand how to manage flow in Information Systems Development (ISD).

2. What is Flow-based Product Development?
   Flow is concerned with processes, people and culture (Melton, 2005).
   Flow is “the progressive achievement of tasks along the value stream so that a product proceeds from design to launch, order to delivery, and raw materials into the hands of the customer with no stoppages, scrap, or backflows” (Womack and Jones, 2010, p. 306).
   Flow focuses on managing queues rather than managing timelines and project phases (Power and Conboy, 2015).

3. Impediments to Flow
   Impediments are “anything that obstructs the smooth flow of work through the system and/or interferes with the system achieving its goals” (Power and Conboy, 2014, p. 2).
   Impediments that impact the flow of work include:
   - Delays
   - Handovers
   - Extra features
   - Extra processes
   - Failure demand
   - Work-in-progress (WIP)
   - Context switching
   - Unnecessary motion
   - Unmet human potential

4. Primary Metrics to Measure Quality of Flow
   - Queue size
   - Cycle time and lead time
   - Cumulative flow diagrams
   - Throughput with demand analysis

5. Lean Software Development Principles
   - Principles of lean thinking are rooted in manufacturing, notably the Toyota Production System.
   - The Principles of Product Development Flow (Reinertsen, 2009)
     - Use economically based decision-making
     - Understand behaviour of queues
     - Exploit variability
     - Reduce batch size
     - Apply WIP constraints
     - Use cadence, synchronisation and flow control
     - Use fast feedback loops
     - Decentralise control
   - Kanban Principles (Anderson, 2010)
     - Limit WIP
     - Visualize workflow
     - Measure & optimize flow
     - Make process policies explicit
     - Manage quantitatively

6. Next Steps
   - Identify and prioritise key flow problems in ISD practices.
   - Design templates to understand the different states that work passes through organisations.
   - Provide a panoptic understanding of flow and its implications for international policy makers and funding bodies.
   - Advance current pedagogy of ISD at third level institutions.
   - Mature theoretical understanding of flow and metrics used to measure the presence of impediments.

Bibliography
- ANDERSON, D. 2013. Lean software development. Lean Kanban University (LKU), Seattle.