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Project Management: Selecting appropriate Project Control methodologies

Peter Cork 15.09.2017

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Who am I?

Project Control methods

Summary

Kalmar Automation briefly

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Who am I?

Peter Cork

- B.Eng, Electronics and IT – VAMK (01/2000)
- Master's BA, International Project Management – TAMK (12/2015)
- PMP Certified – (4/2016)
- 14 Years managing SW Projects
- 2 ½ years managing Automation projects

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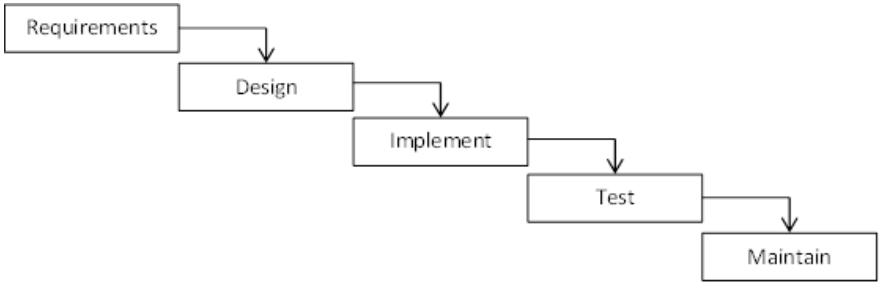
Definition of a project

- Temporary - Must have a beginning and end
- Unique, thus producing a unique deliverable (Brewer and Dittman 2013)
- Complex - Non repeatable (Karlos, Martinsuo and Kujala 2011)
- Typically not predictable (ibid)
- Have constraints, time, cost, scope and quality (Brewer and Dittman 2013)
- Must have a goal
- Must be controlled to know when the goal is reached
- Are influenced by the company or environment in which they operate (Cork, 2015)

Waterfall

- Taken from engineering community and adapted to SW industry around 1970 by W. Royce
- The project phases and tasks follow each other logically
- The method is easily understandable by most people
- Not seen as efficient in companies where people contribute multiple skills (http://www.techrepublic.com 2006)
- Not flexible to allow re-engineering when a problem is identified.
- Gets its name because once water goes over the falls it cannot go back (Brewer and Dittman 2013)



- Requirements are well defined
- Good if team members are geographically separated
- Little feedback between supplier and customer
- Work division is clear
- Strict contracts are in use

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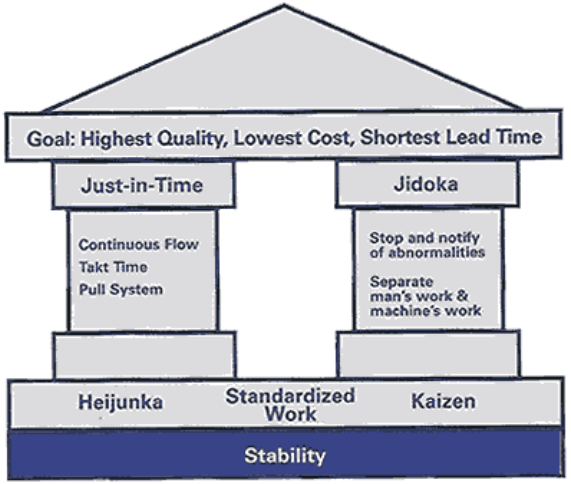
Lean

- Based on the Toyota Production System (TPS) developed by Taiichi Ohno from the 40s to the 70s
- Based on two pillars production (Art of lean Inc. 2006)
  - Just in Time - right parts, in the right amount at the right time using minimum resources
  - Jidoka - humans and machines can detect faults, abnormal conditions and prevent those from being passed onto the next stage in production
    - **Stop the line behaviour**
- Focus on reducing the 7 types of waste



Toyota Production System "House"

Source: Art of Lean Inc. 2006

- Is not a methodology, it's an approach or way of working
- Is the basis for most Agile methods
- Fail fast when developing new products with prototyping
- Use lean start up thinking at project conception to understand the business case and have the courage to 'Pivot' (throw away) when the solution is not suitable
- Use Kaizen (Continuous Improvement)

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Lean – The 7 types of waste in SW

1. **Defects and correction**
   - SW defects create rework , extra labour and costs for both supplier and customer
   - Test properly during development
2. **Over production**
   - Badly thought through requirements or requirements that are produced but not actually needed
   - Use Just-in-Time. The later the requirement is delivered, it is more likely that you will know what is actually needed.
3. **Waiting**
   - Task pre-assignments that can't be started due to missing dependencies
   - Use continuous integration

Lean – The 7 types of waste in SW

- **Conveyance**
  - People having to move about a lot to get information
  - Co-locate the team and make sure information is at hand
- **Motion** (i.e. Non productive time moving from place to place)
  - Attending meetings with people in different departments or locations
  - Try to have cross functional meetings efficiently
- **Processing** (actually over processing)
  - Over engineering or trying to make the product too perfect
  - Understand the concept of minimum viable product
- **Inventory**
  - Creating specifications that won't be needed or future proofing the architecture
  - Use Just in time think, only develop what is needed, when needed.

Extreme Programming

- Said to be defined by Kent Beck around 1996
- Iterative, test driven approach where feedback is used as input to the next iteration
- Deliver the highest value features to the customer first
- Be open to change
- Keep it simple – only do what is needed, no planning ahead
- Communication and pair programming
- Invite feedback and show work in progress
- Solve problems together and have courage to accept or reject solutions

- The customer is always on hand to give feedback
- Specifications are non existent
- Progress needs to be made quickly
- The whole team is co-located
- The team members need to be experienced
- Not suitable for mission of life-critical systems (Wells 1999; Brewer and Dittman 2013)
- Not useful in middleware or drivers where changes are not visible benefit (DiFalco 2014).

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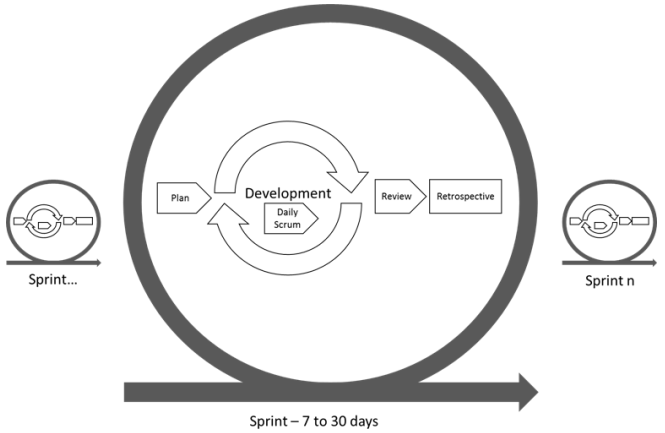
Scrum

- Scrum is an empirical approach where the team engage in iterative sprints Self organizing team with good communication (Schwaber, 1995)
- Backlogs based on user stories are created to define the product
- Several meetings with a single purpose bring structure and control
- The team should be left undisturbed for the length of the sprint



Events in a sprint (Cork, 2015)

- Experienced people needed but juniors can be thrown into the mix
- Unstable requirements
- Customer is only available at sprint boundaries
- Progress needs to be tracked
- Not to be used with non co-located teams (Brewer and Dittman 2013)
- Not to be used with strict deadlines

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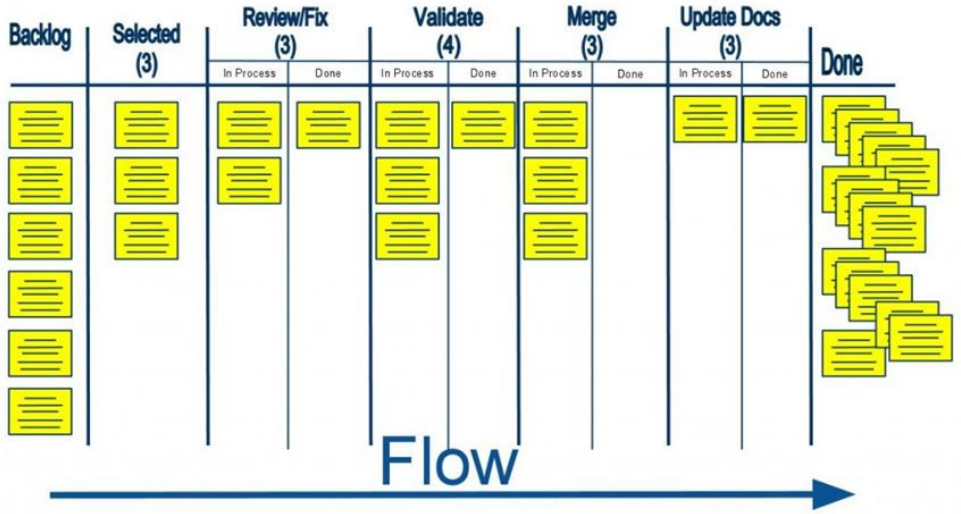
Kanban

- A pull system based on TPS by creating demand through the chain (Art of lean Inc. 2006)
- In SW development or IT the pull is created by a team member becoming free
- Work can enter the process continually but work in progress is limited
- Backlog is used to define the product or work queue



Example Kanban Board. Source: (Mulesoft.org - Rinaudo, Ramiro 2010)

- Good in other organizations where other governance models are used (Ashmore and Runyan 2014).
- Priorities change often or it's difficult to make a plan
- Good for error correction or ticket based work. E.g. IT service desk

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Scrumban

- Takes the structure of scrum but uses Kanban to control work in progress. (Loitto, 2012)
- Is a learning platform to migrate the team from Scrum to a true Kanban process (Ladas, 2015)
- Could also be a sign that the wrong control method has been chosen
- Useful when teaching a novice team Kanban
- Hardening: The end of a scrum based project when work becomes event driven for example by defects (Pahuja, 2012)

#Noestimates

- Movement started by Woody Zuill in a twitter comment in 2012
- Estimates can create arbitrary constraints and false expectations (Killick, 2013)
- Use lean and Agile practices and increment properly and assess value empirically
- Use for example queueing theory to give predictability where needed
- Movement is not against doing estimates, just use real data and empirical practices to provide predictability
- Best used in organizations that do not charge directly to customers e.g a monthly fee (Heusser, 2013)
- Time spent on estimates is time not spent on adding value to the SW product (ibid)

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Other Agile methods

- Scaled Agile Framework (SAFe) (Johnson , 2013)
  - Helps large companies get started with Agile
- Dynamic Systems Development Method (DSDM) (DSDM Consortium 2014)
  - Corporate environments with Roadmaps
  - Deadlines exists, features prioritized with MoSCoW method
- Crystal
  - Various methodologies for varying levels heaviness (Abrahamsson, Salo, Ronkainen & Warsta, 2002)
- Rational Unified Process
  - Focuses on use cases to model requirements in Object orientated systems (ibid)

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Summary

- Choose your methodology carefully
  - Don’t use it because it’s popular
  - Understand with the team strengths and weakness of use
  - If you choose and Agile method, study lean practices first

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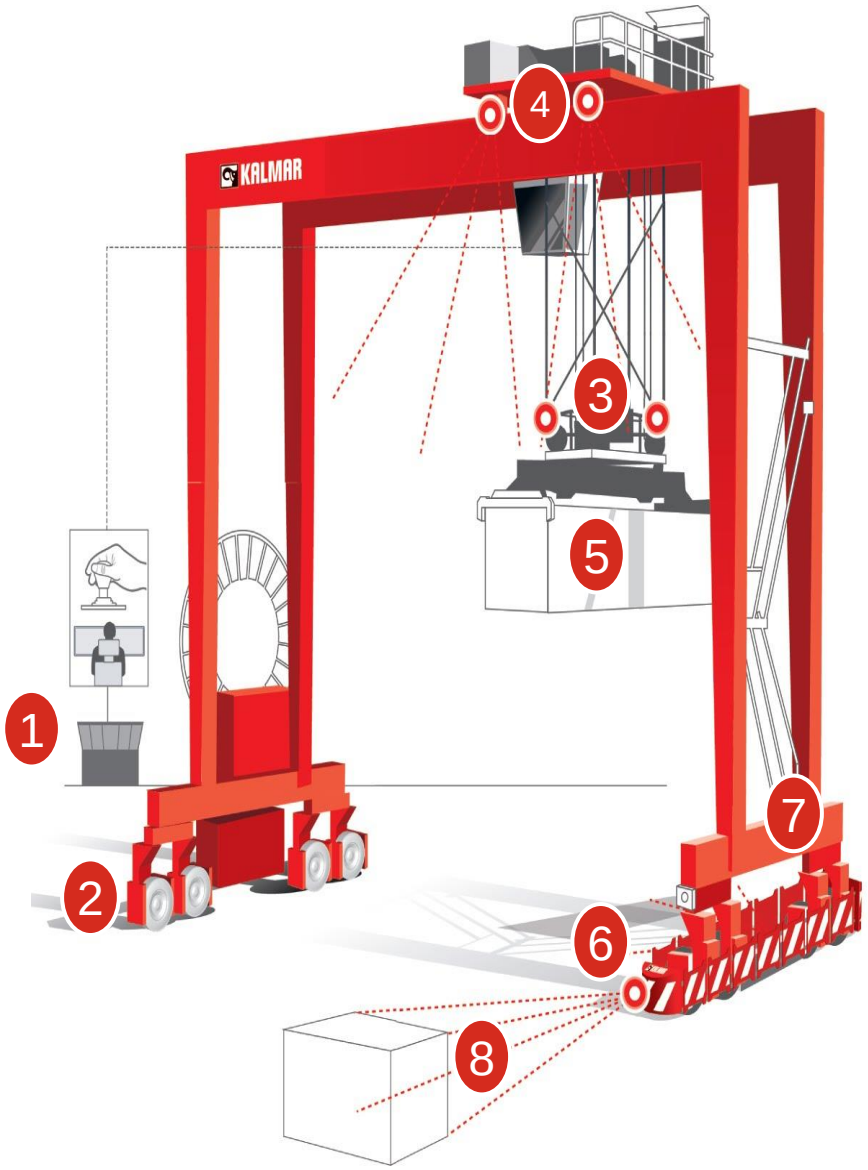
Auto RTG overview

1. Remote control
   Camera system
   Two-way audio system
   Remote CMS
2. Automatic gantry steering
3. Anti-sway system
   Micromoves
4. Automatic pick & place
   Stack profiling



5. Twistlock control
   Soft landing
6. Chassis lift prevention system
   Truck identification
   Chassis alignment system
7. Access control system
   Signal lights
8. Truck lane safety for automated gantry

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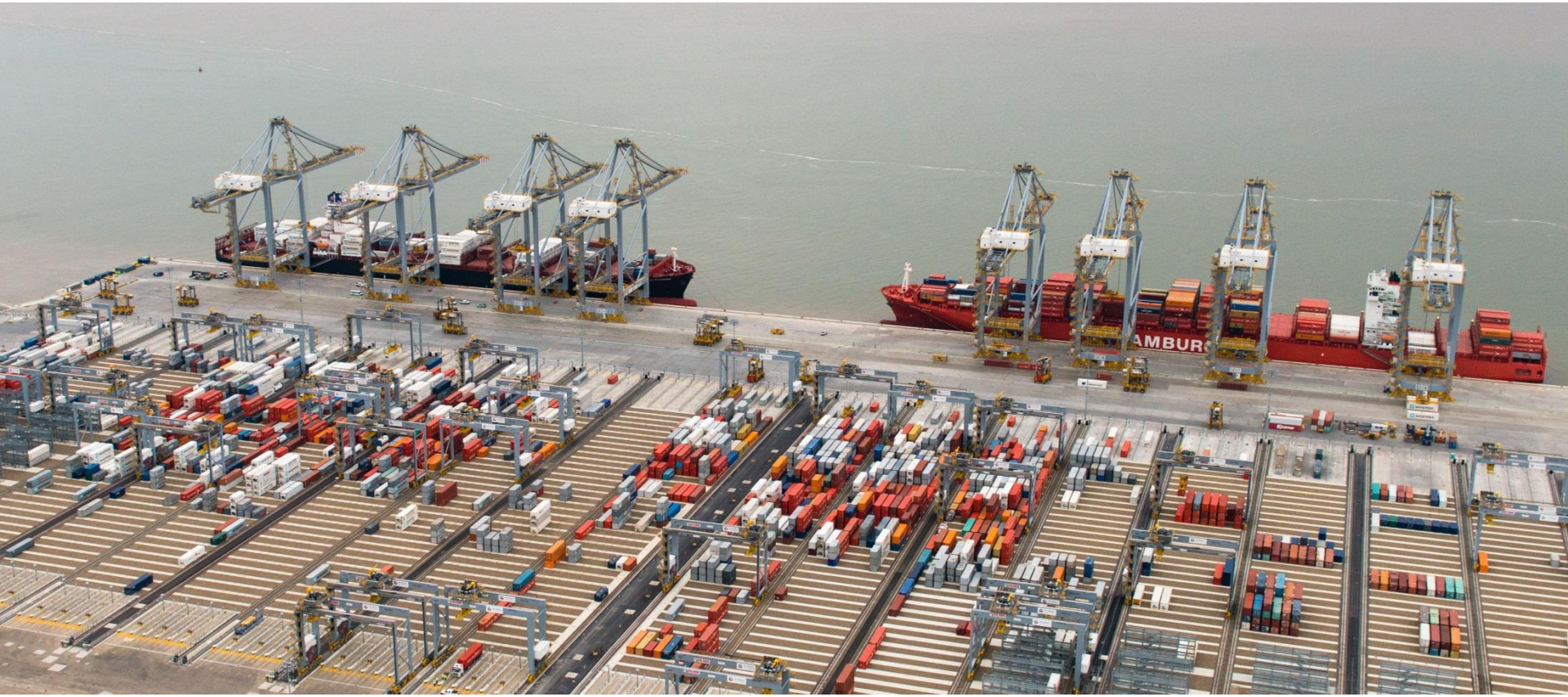

Questions!

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