Pair Development in Traditional Software Process

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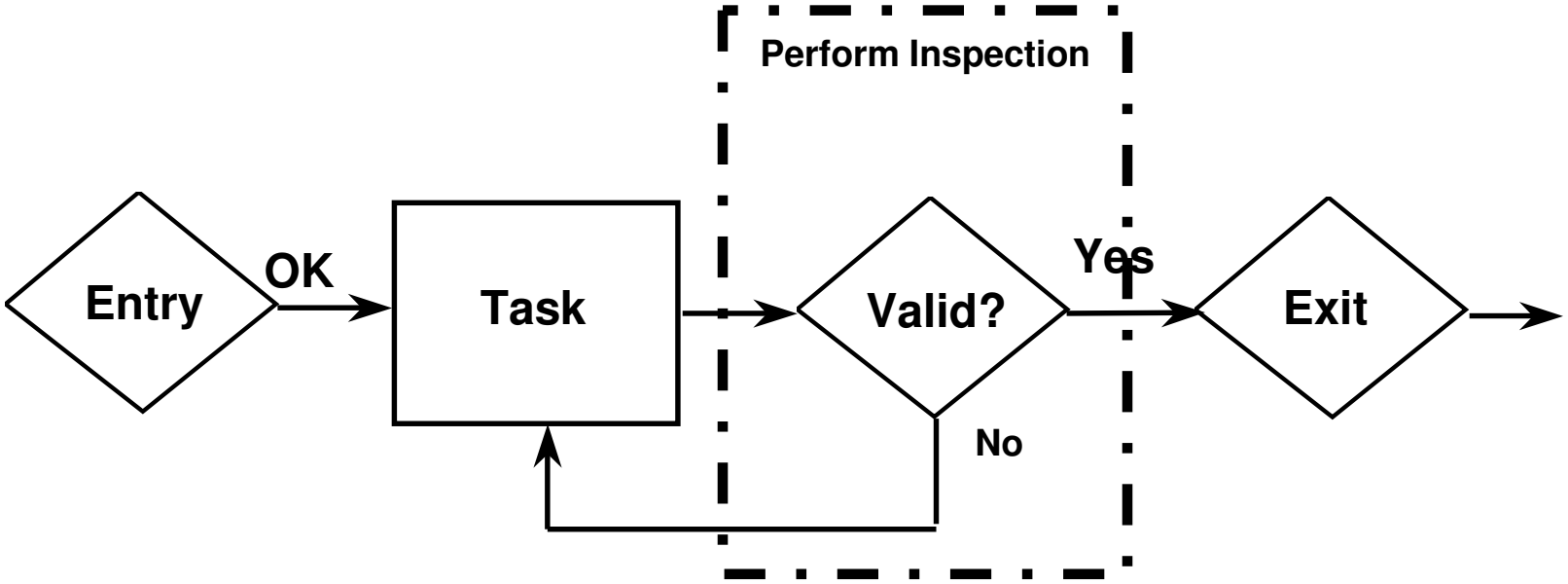
Motivation

•Take advantage of early feedback cycle to shorten the calendar time.

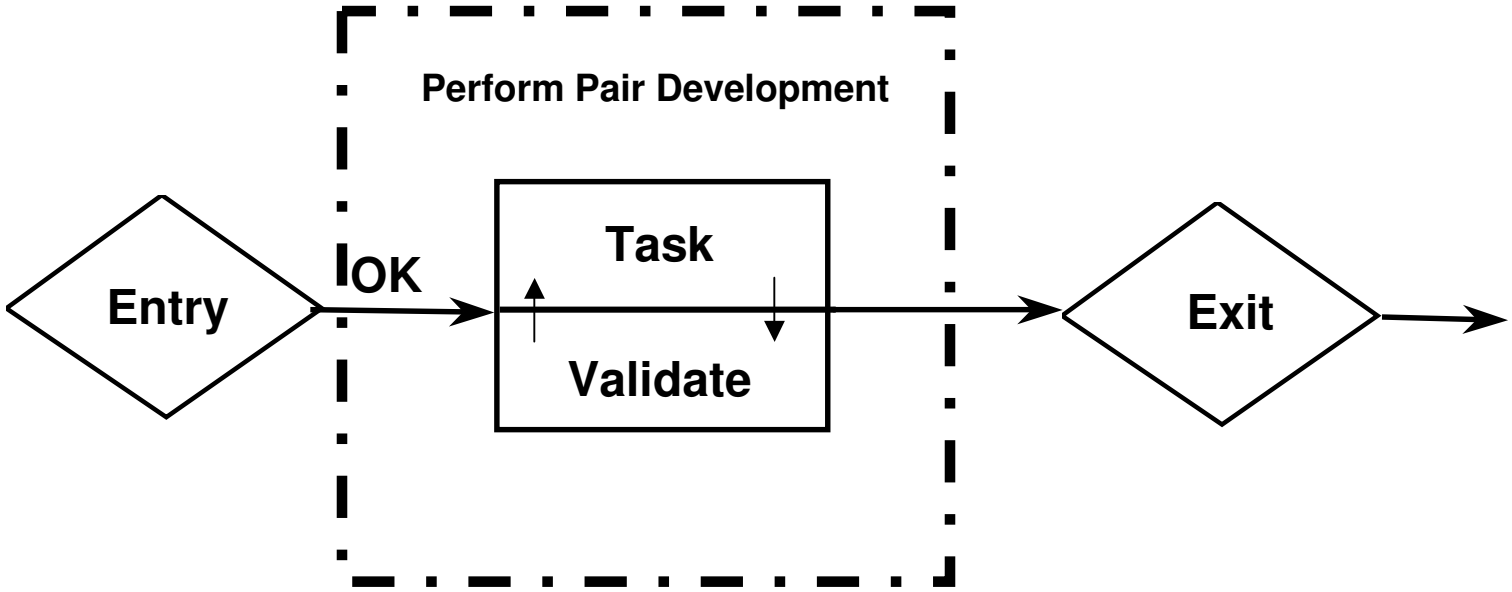
• Understand the advantages and disadvantages of Pair Programming (PP) in traditional vs. agile software development.

• Understand the differences of cost-effectiveness to execute PP vs. Software Inspection.

Inspection Feedback Cycle



Pair Programming Feedback Cycle



Experiment Results

Total Development Cost / Quality

		Classroom Experiment (means)	Industry Experiment
man-hour / **# of defects**	Pair Development Group	526.737 / 4.429	1392.9 / 21
	Inspection Group	695.11 / 5.143	1342 / 29

Conclusions of the Experiment

- The classroom results showed that average total development effort of the PD group was 24% less than inspection group with the improved product quality.

- The industry experiment showed PD to have about 4% more effort but about 40% fewer major defects.
  - For the inspection team to achieve the same quality level as the PD team may require more TDC than for the PD team.

- PD offers the option of reducing the calendar time.

- Experiment provided insights on when to use pair development and inspections

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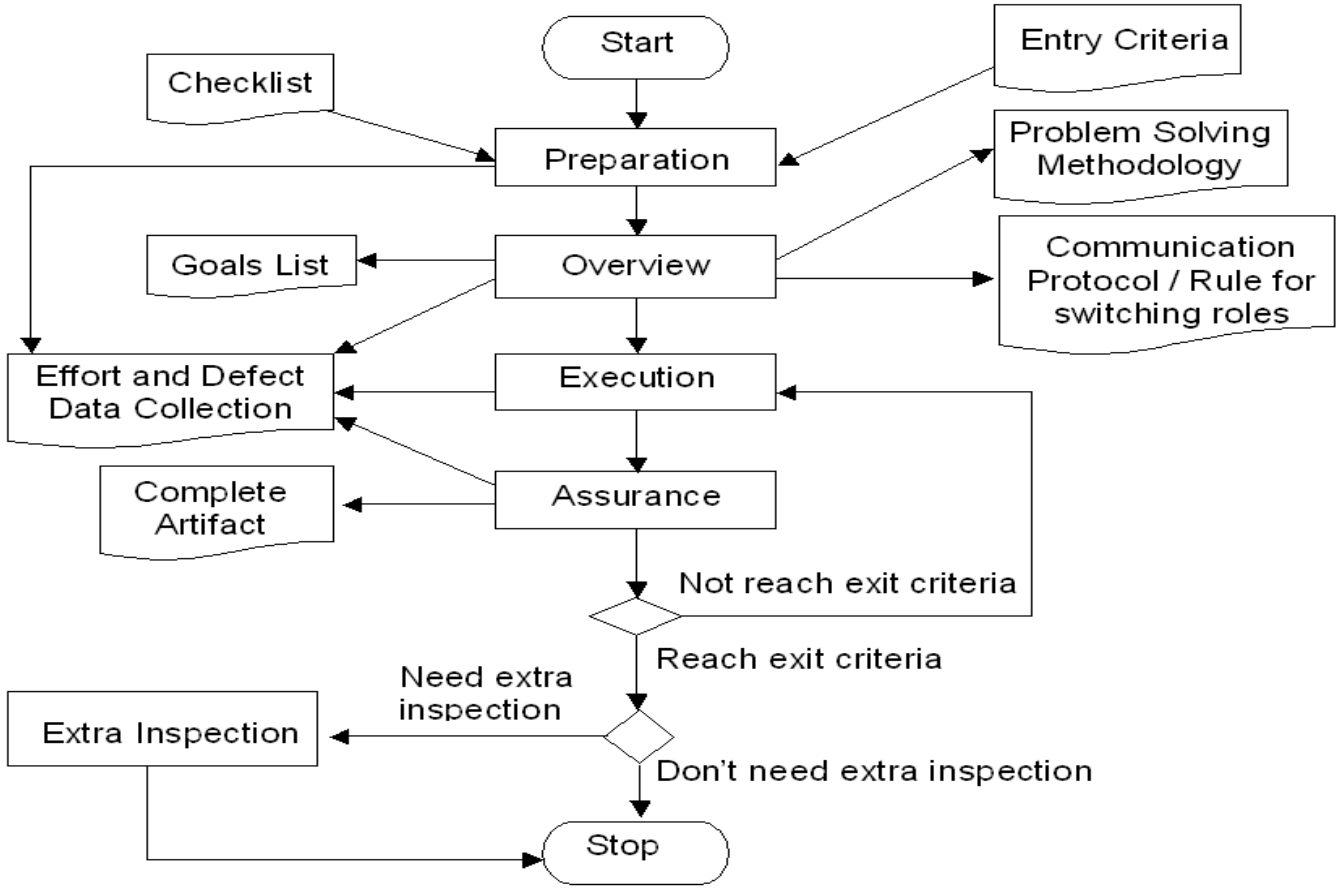
Decision Framework (example)

Constraints							Technique
Project Size	**Time to Market Risk (T) vs. System Failure Risk (F)**	**Personnal Level** (need training / mentor?)	**Peer Review Experiences**	**% of developer understand the system** (eg. requirements, design, technology, standard)	**% of High Risk Module** (eg. reused, high dependability modules)	**Integrate with Others Systems**	
Small - Medium	T > F						Pair development
Small - Medium	T > F				< 40%		Pair development follow by inspection on high risk modules
Small - Medium	T > F				> 40%		Pair development follow by inspection on high risk modules with high criticality rate
Small - Medium	T > F					Yes	Pair development follow by inspection on the system interface
Small - Medium	T > F			Medium - Low			Pair development and extra inspection on key artifacts at the beginning of life cycle
Medium	T > F	High: (L1A + L1B > L2 + L3)					Inspection emphasize on key artifacts and high priority modules at the beginning of each iteration
	T > F		Familiar with Software Inspection				Inspection on key artifacts and high-medium piority modules for each iteration
Large	T > F						Inspection on key artifacts and high-medium piority modules for each iteration
	F > T						Inspection
	F > T	Medium: (L1A + L1B = L2 + L3)					Pair development at the beginning of each iteration / phase and inspection
	F > T		Familiar with Pair Development				Pair development follow by inspection on key artifacts and high, medium criticality modules

Question & Answer

- Thank you -

Pair Development (PD)



Experiment Results

Distribution of Software Cost of Quality

		Classroom Experiment (means)	Industry Experiment
Internal Failure Costs (%)	Pair Development Group	1.518	16.73
	Inspection Group	6.274	23.62
Appraisal Costs (%)	Pair Development Group	19.194	23.38
	Inspection Group	34.081	32.46
Production Costs (%)	Pair Development Group	59.586	46.97
	Inspection Group	44.133	31.97