CS 5704: Software Engineering

Goal Question Metric

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Context

- The overarching objective of any software development effort is to create a quality product

Quality

- What is it?
- Different perspectives
  - Customers
  - Users
  - Developers (software and usability engineers)
  - Support and maintenance roles
  - ...

Views on quality

- Quality manifests in different ways to different stakeholders
- End users – usability, user experience, effective over time, ...
- Developers – conformance to requirements, standards, low complexity, clearly documented, ...
- Customers – adding business value, leading to better productivity to end users

Can we define quality?

- *"conformance to explicitly stated functional and performance requirements, explicitly documented development standards, and implicit characteristics that are expected of all professionally developed standards"* – Pressman
- Pressman is a software engineer

Measuring quality

- Cannot be measured directly
- Measured using indicators
  - Usability – time on task, error count, etc.
  - Reliability – mean time to failure, etc.

Quality of interactive software

		Process	Product
	SE	SE process quality	SE product quality
	UE	UE process quality	UE product quality

Process dimension

- Software engineering
  - Capability Maturity Model
- Usability engineering
  - recent work in this direction
- SE + UE
  - extent of support for joint execution of life cycles

Product dimension

- Software engineering
  - conformity, reliability, maintainability, complexity, reusability, ...
- Usability engineering
  - usefulness, satisfaction, utility, learnability, efficiency, ...
- Quality of work products

Other dimensions?

- Static vs. history metrics – Basili, Briand, and Melo
- Code (e.g. LOC) vs. design (e.g. inter- and intra-module measures) vs. specification (e.g. function points) – Sheppard
- Product vs. process vs. resource – Fenton and Neil
  - shown next

	Product	Process	Resource
Internal	size, reuse, modularity, redundancy, functionality, syntactic correctness	time, effort, # coding faults	price/size (of software and hardware)
External	comprehensibility, maintainability	cost, cost-effectiveness, stability	usability/ reliability (of software and hardware)

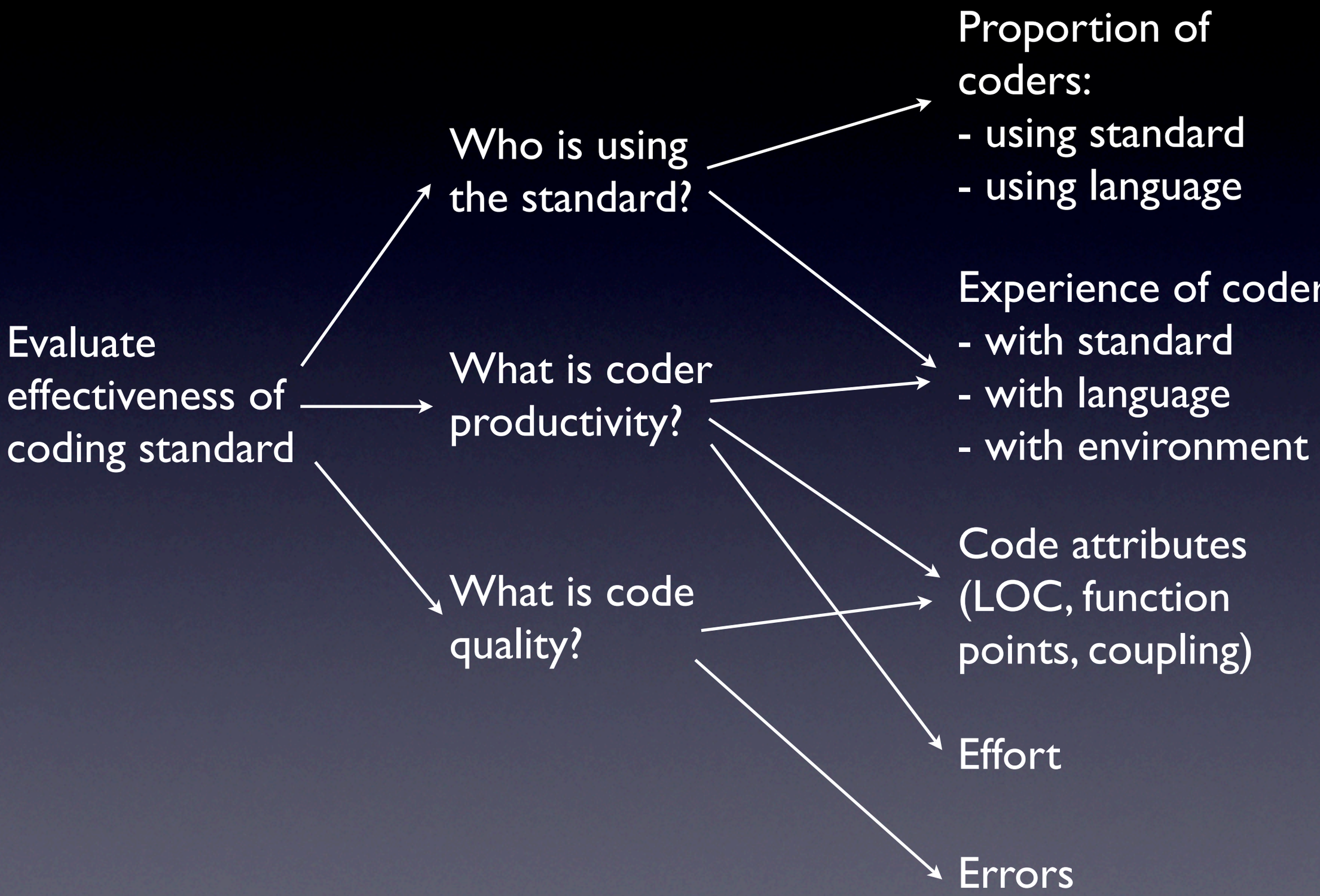
Discussion

- Correlation does not imply causation!
- Driving in winter and # of accidents
- More LOC, function points indicate better quality?

GQM

- Postulate the goal of the evaluation
- Derive questions, the answers to which will indicate if the goals are met
- Analyze and determine measurements that are necessary to answer questions

Goal	Questions	Metrics



How does this apply to you?

- Each team apply GQM method to think about evaluation plan
- What are your goals for your group project?
- What questions do you need to answer to see if you reached your goal?
- What measurements do you need to take to answer those questions?

end