# Performance

*Probably* *a good thing to have in Software Engineering*
*by: Gee, Starbuck, Waddle*

# Overview

➔ Performance describes the usability of a system.

➔ This can refer to: system efficiency, user productivity and the development process (productivity).

➔ There exist numerous techniques designed to measure performance in these areas.

# Performance v. Efficiency

➔ Efficiency is an internal quality related to performance.

➔ Performance is an external quality based on user requirements.

➔ Relationship: efficiency effects (and may determine) a system's performance; not the only factor.

# Measuring Performance: Complexity

➔ Performance can be evaluated by considering the time complexity of algorithms used in the system.

➔ This method is usually generalized for worst- or average-case (asymptotic notations)

➔ A limitation: information can be too unspecific for a particular implementation.

# Other Evaluations: Measurement

➔ We can measure the performance of the system using software and hardware monitors that collect data while the system is running

➔ This allows us to check for bottlenecks in the system.

# Other Evaluations: Analysis

➔ This approach requires us to build a model of the system in order to analyze it.

# Other Evaluations: Simulation

➔ Similarly, using this approach, we build a model that simulates the product.
➔ Analytic models are usually easier to build but less accurate.

# Measuring Performance

➔ Combining the techniques allows us to build a better model.
➔ An analytic model can provide a general understanding of the performance-critical areas
➔ Then we can build simulation models of the areas that require more study.

# Size of projects v. Performance model

➔ In a small project, most performance models do not apply because they can be built with efficiency and performance in mind.
➔ The larger the project, the more effort is required to build models and to make design decisions.

# Wrap-up of Performance in SE

➔ Performance is *not* the same as efficiency
➔ Performance is an external quality defined by its users
➔ There are several ways to measure performance depending on size and complexity.