

ECONOMIC HYPOTHESIS ILLUSTRATION
ABOUT SOFTWARE QUALITY INFLUENCE ON
BUSINESS PERFORMANCE

Karthik Ramachandran



Agenda

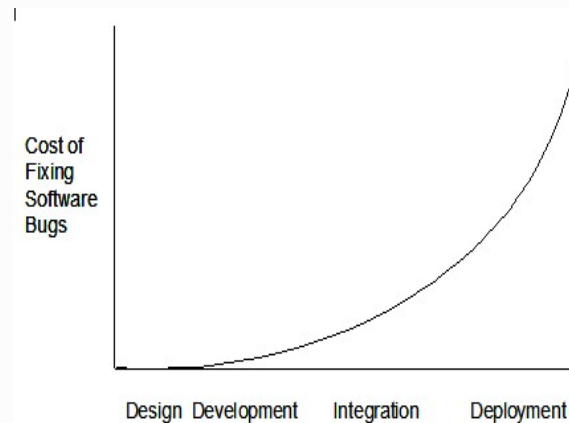
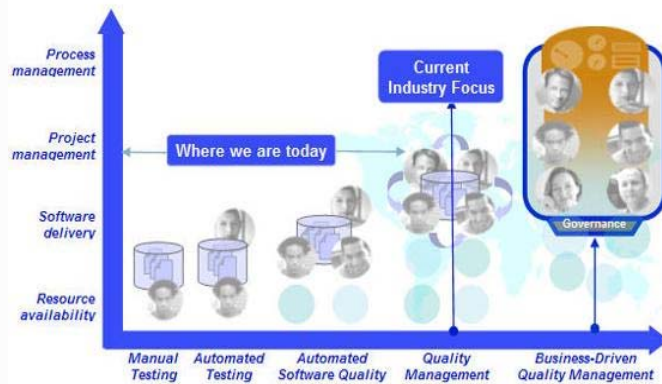


- Introduction
- Software Testing value is not a single question
- Production Theory
 - Production Function Approach
- Competitive Strategy Theory
 - Business Performance Analysis
- Consumer Theory
 - Consumer Surplus
 - Comparing and Integrating the Alternative Approaches
- Brainstorming activities
- Summarize
- Assumptions
- Next steps

Introduction



- Business value of Software Testing
- Enormous Businesses investment
- Studies and contradictory evidence
- Results are based on what Question are asked
- Seemingly contradictory results are not contradictory
- Asking Right questions



Software Testing value not a single question

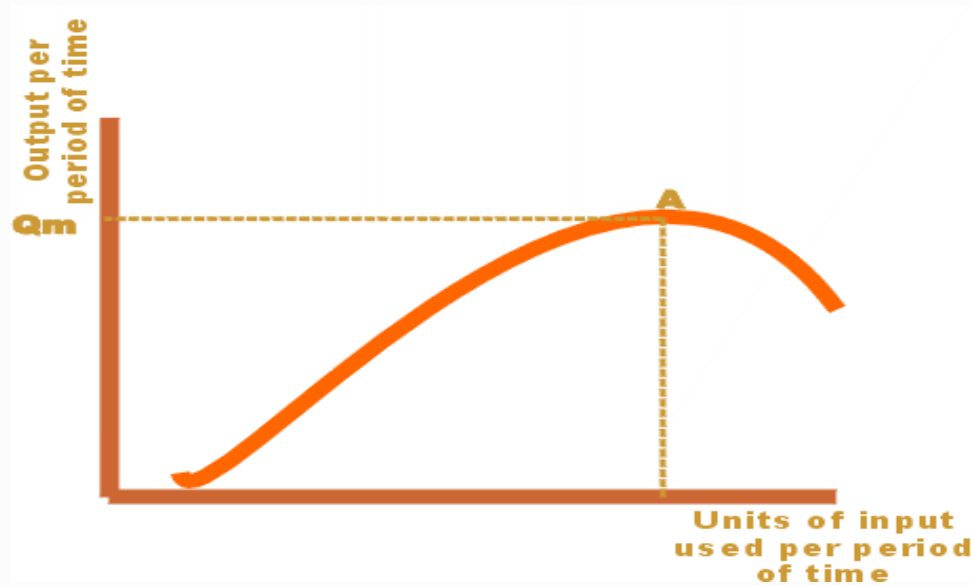


1. Have investments in Software Testing increased productivity?
2. Have investments in Software Testing improved business performance?
3. Have investments in Software Testing created value for consumers?

Production Theory



- The net marginal returns (gross returns less costs) for any input will be zero.
- However, because costs are positive, the gross marginal returns must also be positive.



Production Function Approach

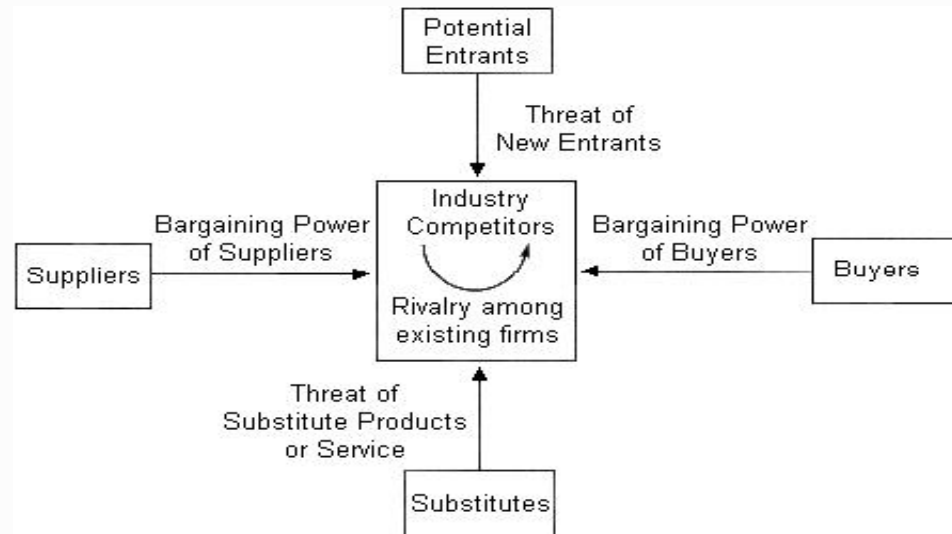


- Output elasticity of Software Testing Capital = percentage increase in output provided by a small increase in Software Testing Capital.
- Marginal return (gross) on Software Testing investment = elasticity / percentage share of Software Testing Capital



Competitive Strategy Theory

- “Barrier to Entry” : anything that allows firms to earn supranormal profits



Source: <http://www.brs-inc.com/porter.asp>

Business Performance Analysis

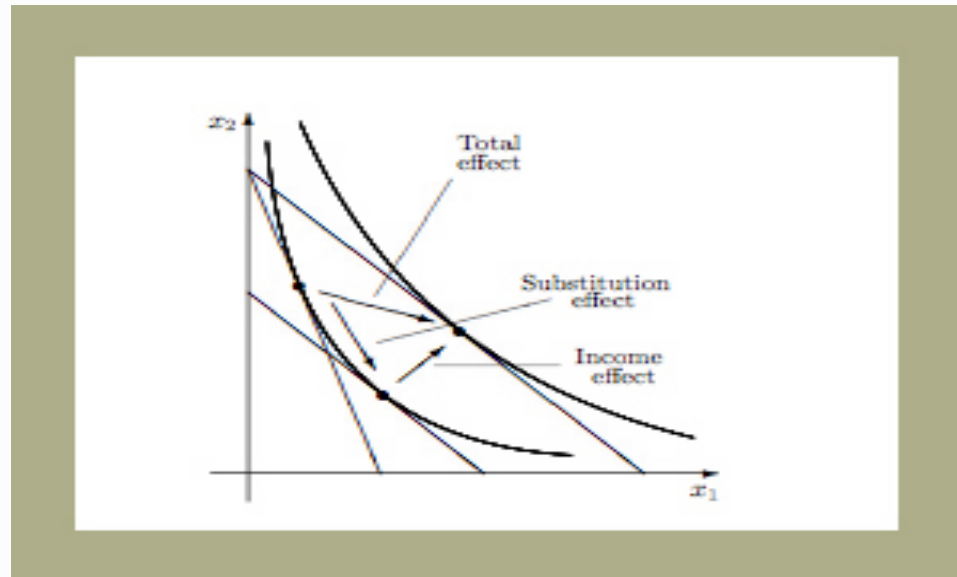


1. Profitability as measured by Return on Assets (ROA)
2. Profitability as measured by Return on Equity - "Economic Value Added",
3. Total shareholder return

Consumer Theory



- The surplus from an input to production will be passed along to consumers - estimate of consumer surplus.



Consumer Surplus



- Cost of Software Testing has dropped by several orders of magnitude
- Benefits :
 - A lower price for investments that would have been made even at the old price, and
 - New investments in Software Testing that create additional surplus

Comparing / Integrating the Approaches



- a. The production theory approach measures the marginal benefit of Software Testing investment.
- b. The performance ratio approach shows whether firms to create competitive advantage can appropriate the benefits created by Software Testing.
- c. The consumer surplus approach focuses on whether the benefits are passed on to consumers.

Brainstorming activities



- There are a number of limitations of this data set.
 - I. First, the data are self-reported, which could lead to error in reporting and sample selection bias.
 - II. Second, the survey records a relatively narrow definition of Software Testing.
 - III. Finally, we use estimation procedures for some items.

Summarize



- Production function estimates of the productivity of Software Testing Capital suggest a gross rate of return greater than 60%,
- When examining business performance as the dependent variable, we find evidence of a positive impact on performance.
- Finally, using the consumer surplus approach, we estimate the total benefit of Software Testing to be substantial.

Such An Increase In Efficiency (And Therefore Productivity) Can Be Shown To Intensify Competition By Lowering Barriers To Entry And Eliminating The Inefficiencies In The Market, Which Enable Firms To Maintain A Degree Of Monopoly Over Their Customers

Assumptions



- Production function approach: Inputs "cause" output. Yet, it may also be true that output "causes" increased investment in inputs,
- Gross returns to Software Testing appear to be very high, the net returns are much more difficult to calculate.
- When we calculate a cost of Software Testing capital using commonly accepted methods, we have not considered any other additional costs.
- Consumer surplus approach: The demand curve is stable over time, In reality, it is likely that diffusion of the Software Testing "innovation" would have led to some increase in quantity
- Consumer surplus estimates : Likely to be underestimates.

Next Steps



- Go beyond estimating the "average" effects of Software Testing.
- An attempt to eliminate the Assumptions.
- Best practices.

Discussion

