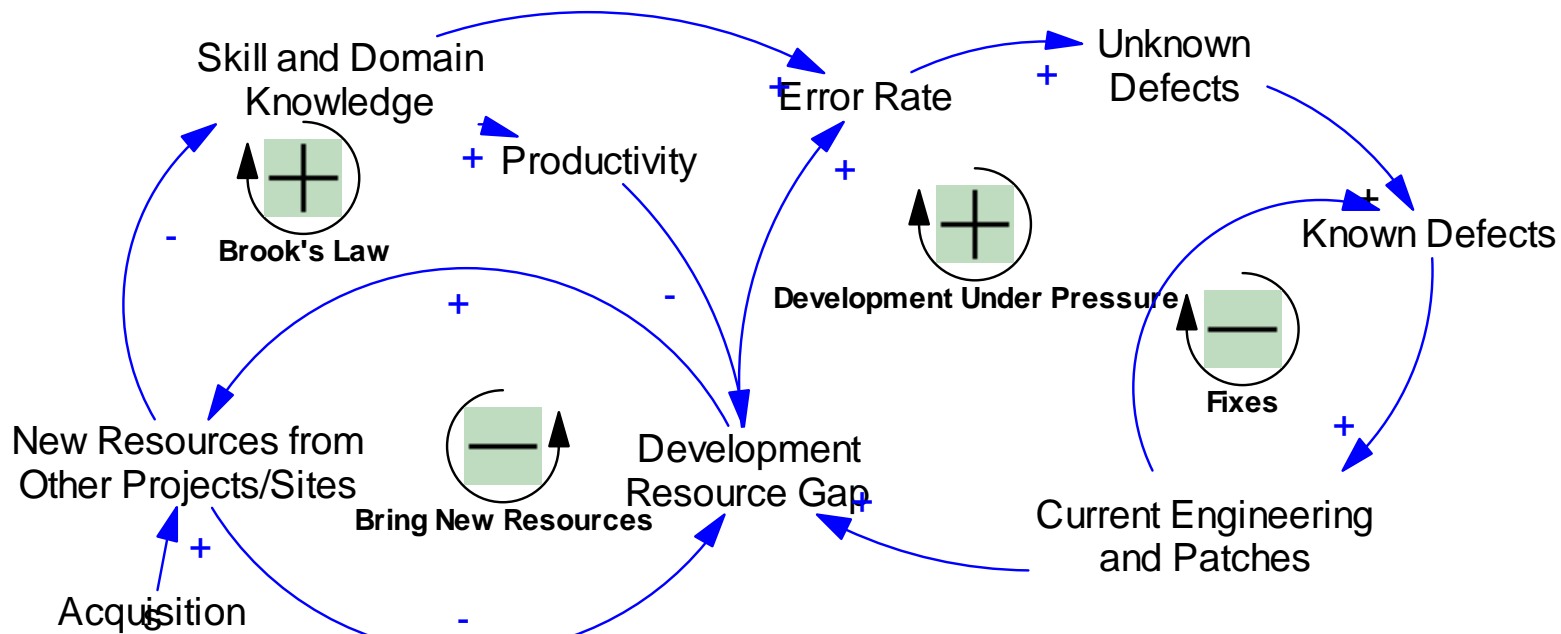


Appendix 3-2- Feedback loops for multiple-release product development

The following set of feedback loops are developed as part of the research leading to the essay “Dynamics of Multiple-release Product Development.” The role of loops in the research process is briefly discussed in Appendix 3-1.

These loops include several different hypotheses that came out of discussions with members of the product organization. Only a subset of these loops are captured in the detailed simulation model (Appendix 3-3) and a smaller fraction of the most important ones in the original essay. In each page a set of loops which relate to a distinct area of product development and sales is depicted. Short descriptions of loops are also provided.

Development dynamics: Fixes and Defects



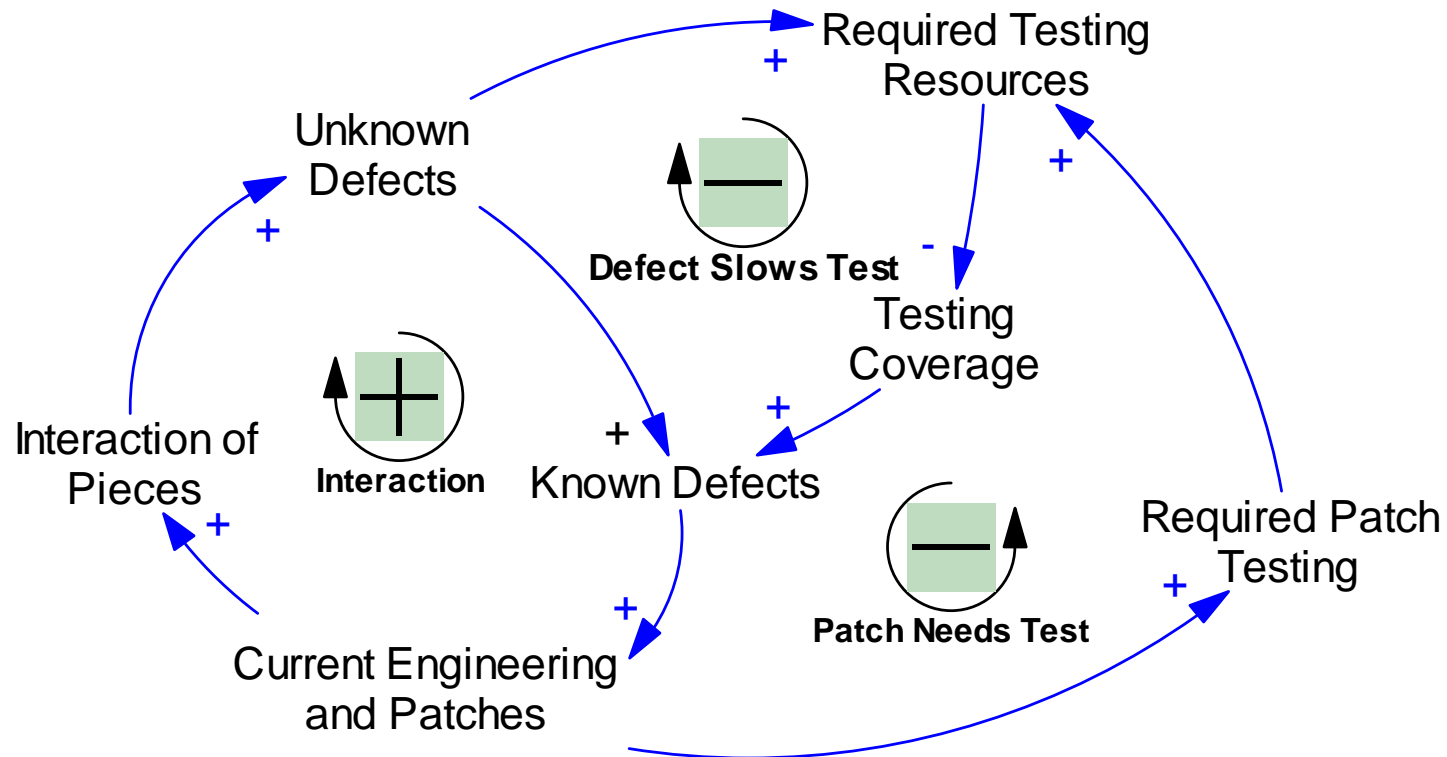
Fixes: The more the defects, the more fixing to reduce them

Development Under Pressure: Current engineering cuts from development resources and increases errors

Borrow Resources: We add resources from other projects or other sites to close the resource gap

Brook's law: Adding resources in the middle of project adds to problems since there are not familiar, make more errors, and take away time for training. Acquisitions can have similar challenges.

Testing, and Patch Interaction

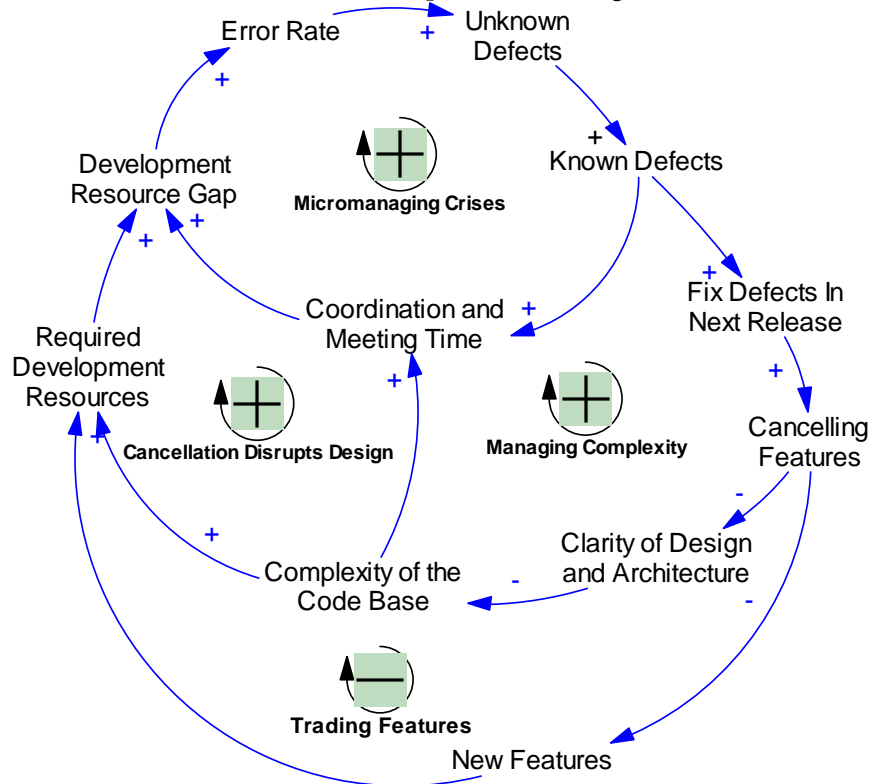


Defect Slows Test: Code with a lot of bug takes more time per test

Patch Needs Test: Testing of patches cuts on testing resources for new code

Interaction: Patches interact and create more defects

Complexity



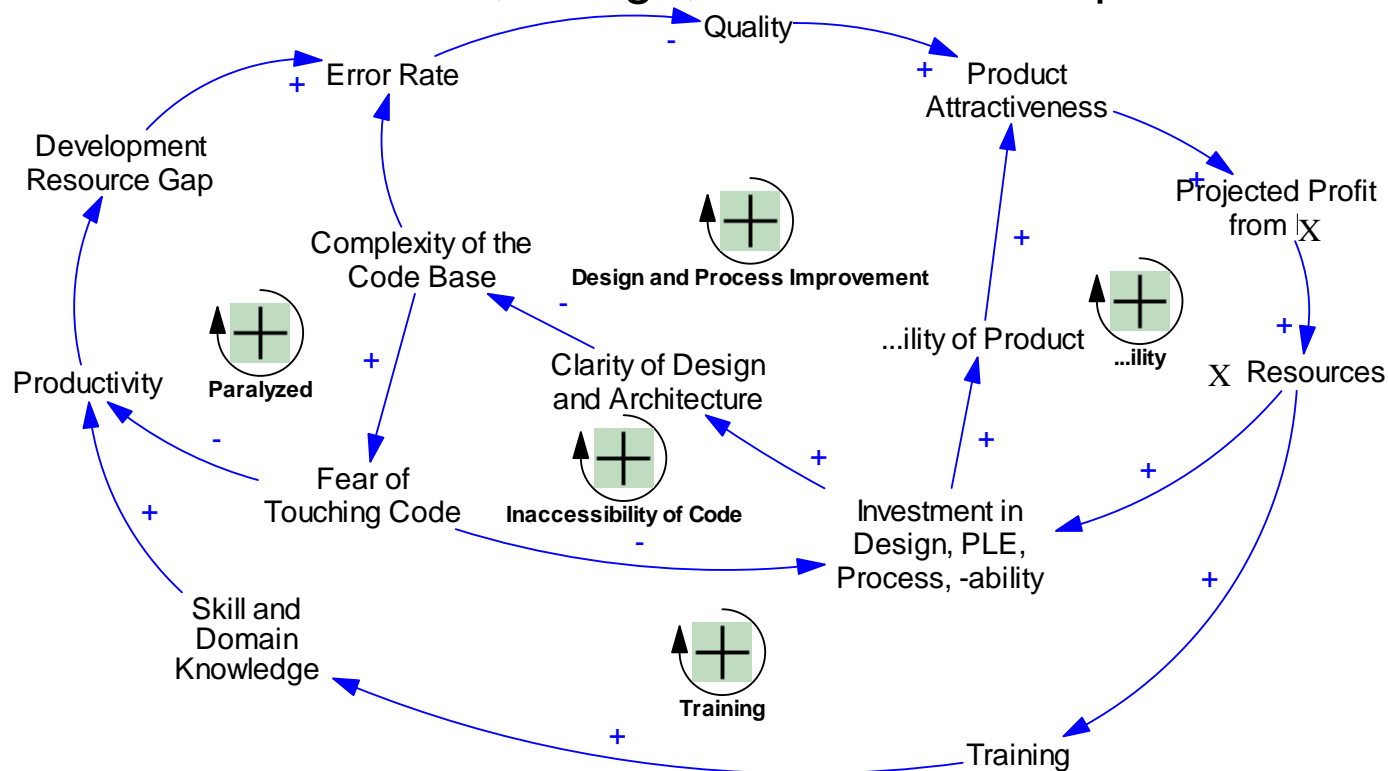
Trading Feature: We cancel new features to catch up with fixing defects

Coordination Challenge: Coordination time and presentation takes from development

Managing Complexity: Complexity of code base increases coordination cost

Cancellation Disrupts Design: Cancellation of features has negative effect of coherence of design

Architecture, design, and Process Improvement



Design and Process Improvement: Lack of resources cuts down on different process improvement and design efforts

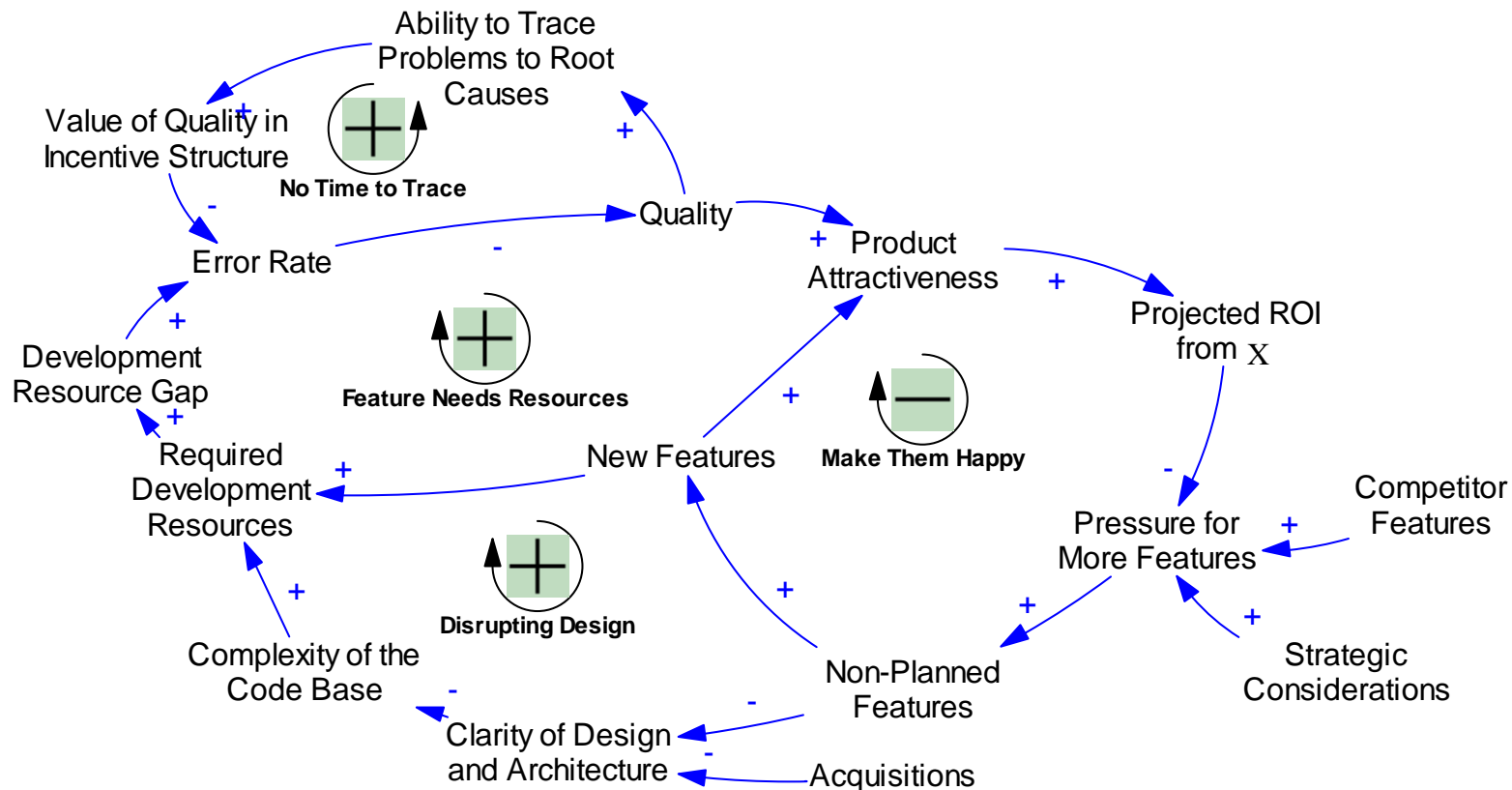
...ility: The basic ...abilities are important for attracting customers

Paralyzed: Complexity of code and fear of touching it cuts down on productivity

Inaccessibility of Code: Developers fear going deeper into old code to improve design

Training: Availability of resources impacts the training and skill of people

Features Dynamics and Incentive



Make Them Happy: Executives try to save the product by promising new features to customers

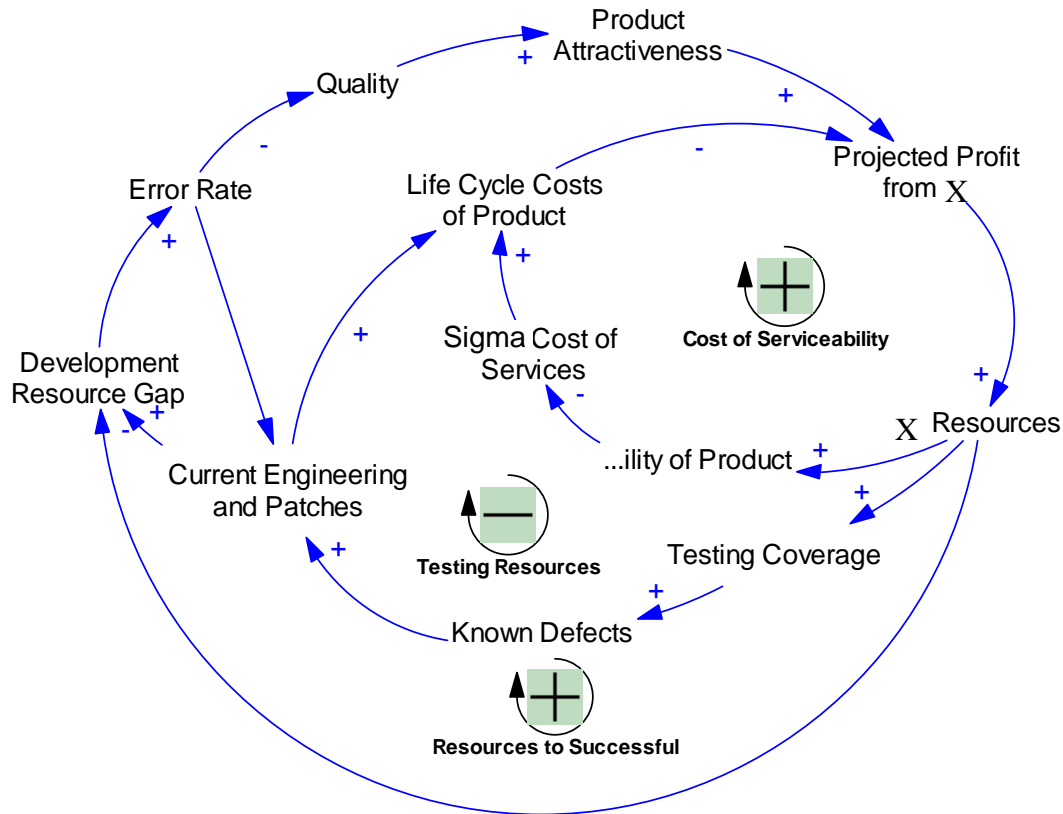
Disrupting Design: Last minute features disrupt the architecture and design of the product

Feature Needs Resources: Non-planned features, satisfy customers, but need resources

No Time to Trace: With too many escalations, we can't find who is doing high vs. low quality job

Acquisitions: Different architectures coming from acquisitions put together increase problems

Resources to Successful and Life Cycle Costs

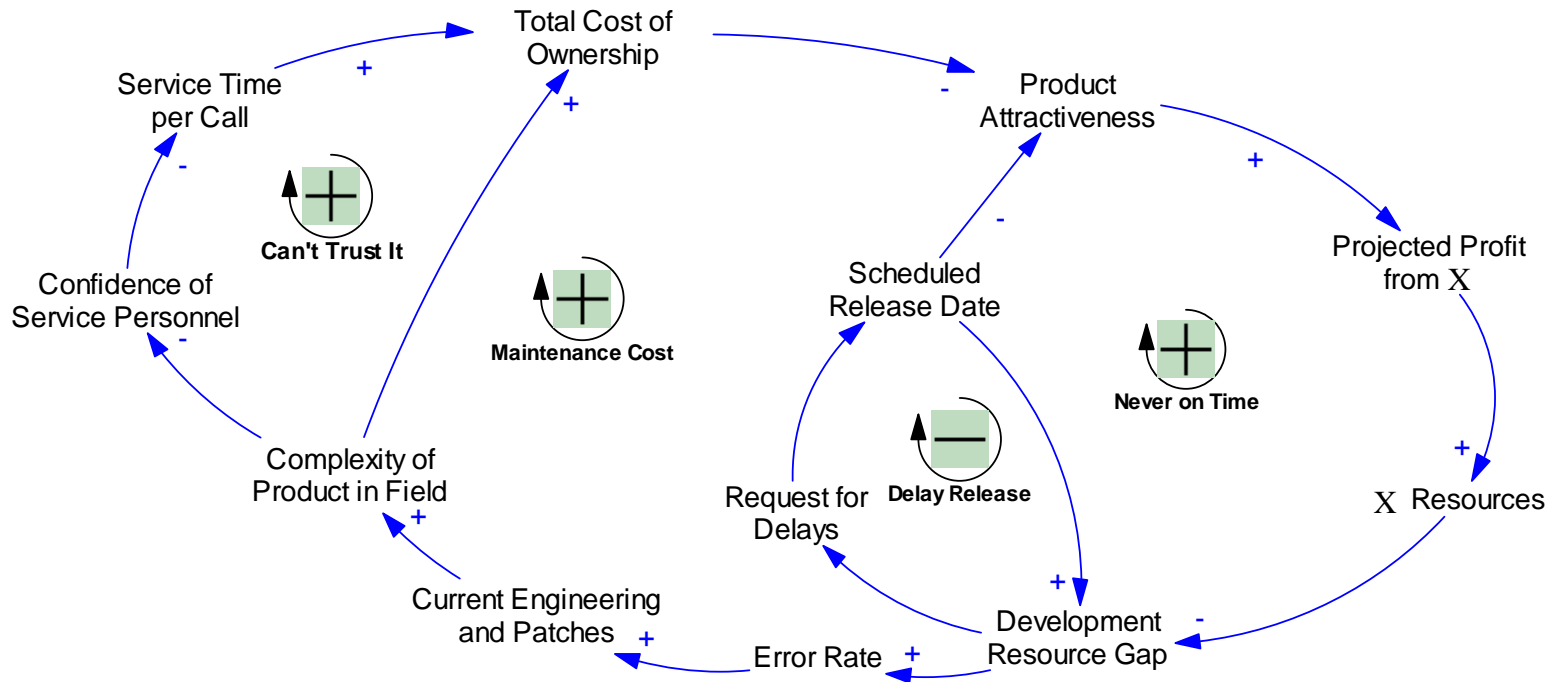


Testing Resources: Test resources are impacted by performance of product in market

Cost of Serviceability: Lack of investment in ...ility increases the life cycle costs of service

Resources to Successful: Resources allocation between products partially depends on their performance

Costs to Customer



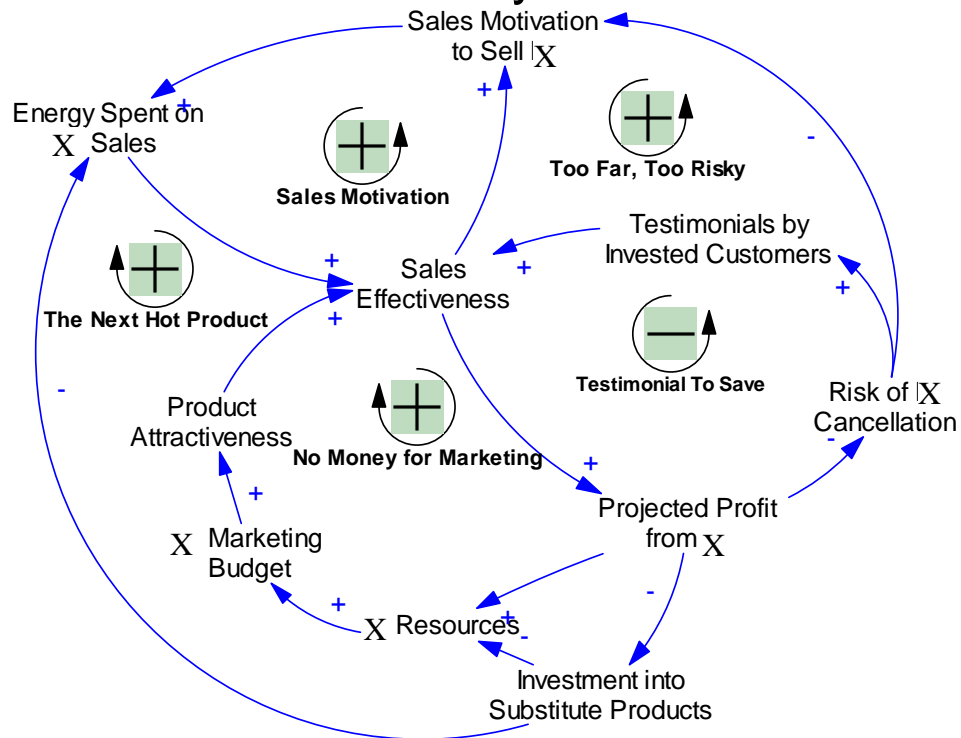
Delay Release: We delay release if there is no way to finish it ontime

Never On Time: Delays result in customer dissatisfaction

Maintenance Cost: complexity and patches add to maintenance cost for customers

Can't trust it: Not trusting the product Service personnel spend a lot of time on calls caused by customer error

Sales Dynamics



- Sales Motivation:** Sales people get more and more de-motivated to sell the product
- Testimonial to Save:** Some customers give testimonials to save the product hence their service
- Too Far, Too Risky:** Long sales cycle de-motivates sales of the product with long sales cycle
- No Money for Marketing:** We can't invest too much in marketing if it is not selling
- The Next Hot Product:** If the product is not selling, we divert attention to a replacement product

Spaghetti: Set of all loops!



