Renovate to Innovate

The Fundamentals of Transforming Legacy Architecture

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Payment Experiences

Rider Pricing

Azure Cloud Networking

MS in Computer Science

Agenda

- What are legacy systems?
- Legacy… but why?!?
- Technical renovation: What and When
- Guiding principles and best practices

First word that comes to mind when you think of Legacy?


legacy
outdated
obsolete
old
antiquated
inflexible
unsupported
slow
reliable
essential
customized
vulnerable
complex
expensive
maintenance
inefficient
critical
proven
historical
difficult
downtime
documentation
integration
costly
compatibility
established
traditional
system
technology
migration
code
retro
software
risk
archaic
dependable
stable
heritage

What are Legacy Systems?

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A system that is incapable of keeping up with business requirements

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Signals of Legacy

- Decrease in Innovation Velocity

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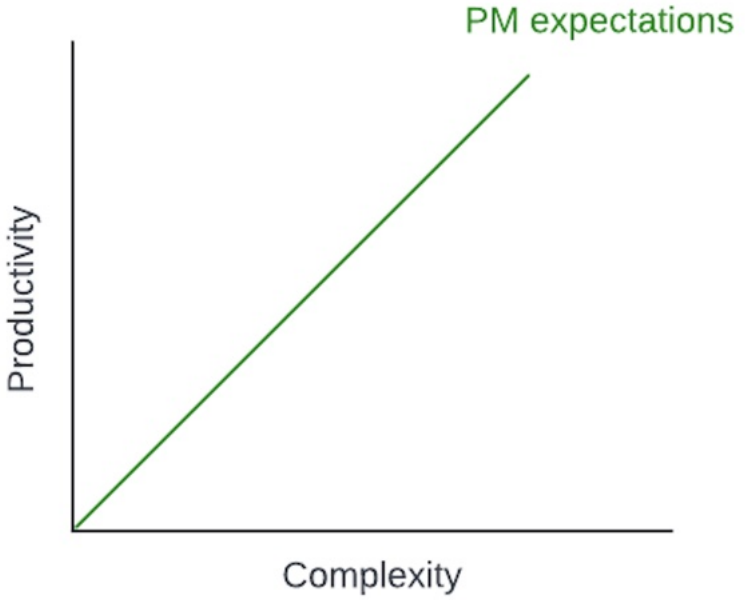

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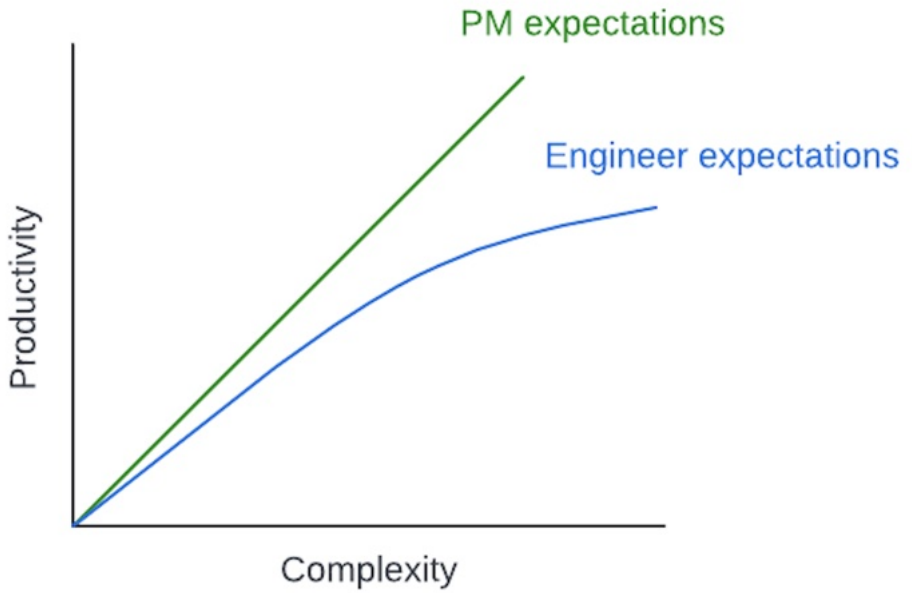

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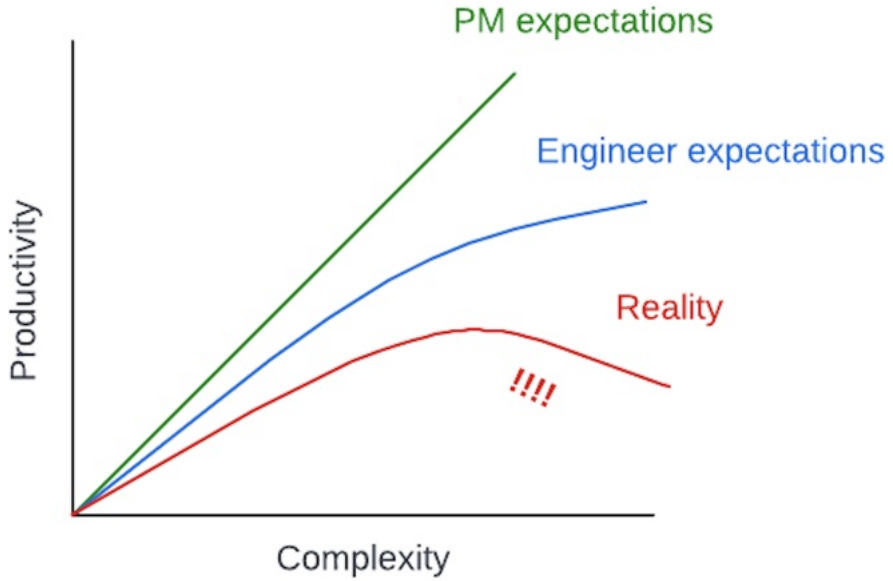

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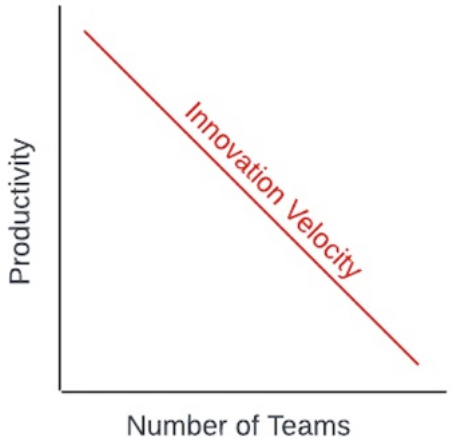
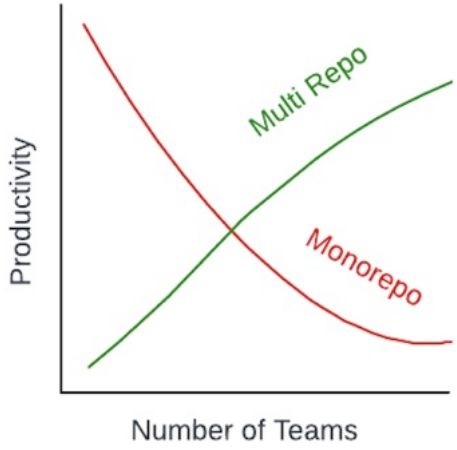
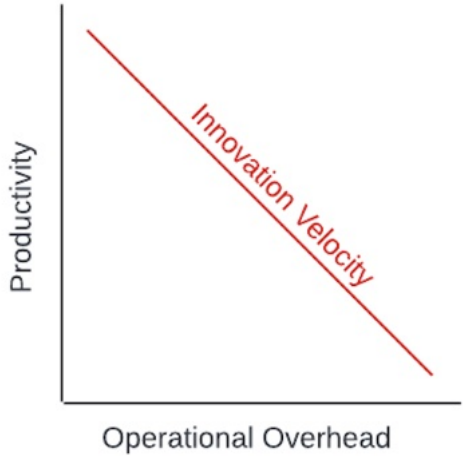
- Decrease in Innovation Velocity

Sources of complexity







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- Decrease in Innovation Velocity
- Degradation of Quality of Experience (QoE)

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Amazon Found Every 100ms of Latency Cost them 1% in Sales

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- Scaling Challenges

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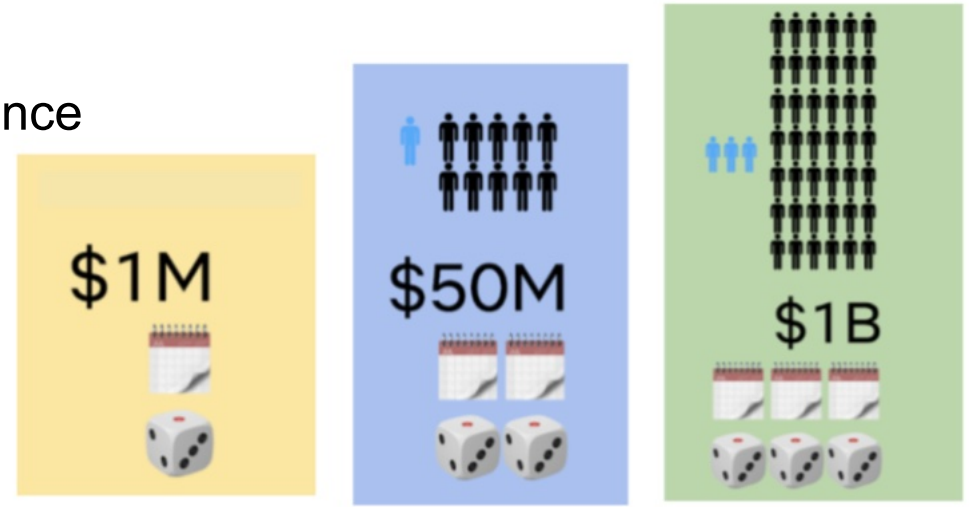

What are Legacy systems?

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Signals of Legacy

- Decrease in Innovation Velocity
- Impact to Quality of Experience
- Scaling Challenges

Legacy… but why?

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- Advancement in Technology

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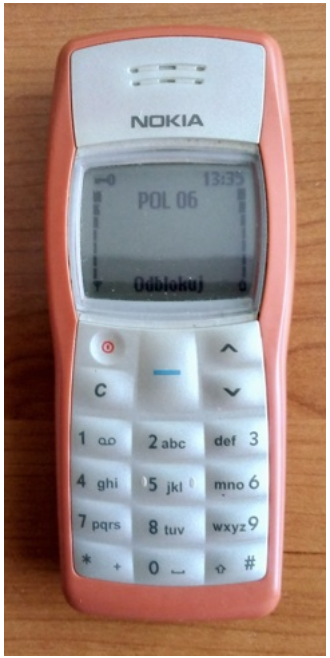

Legacy… but why?!?

- Advancement in Technology
- Bit Rot Theory

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Code Duplication

Knowledge loss / No documentation

Legacy… but why?!?

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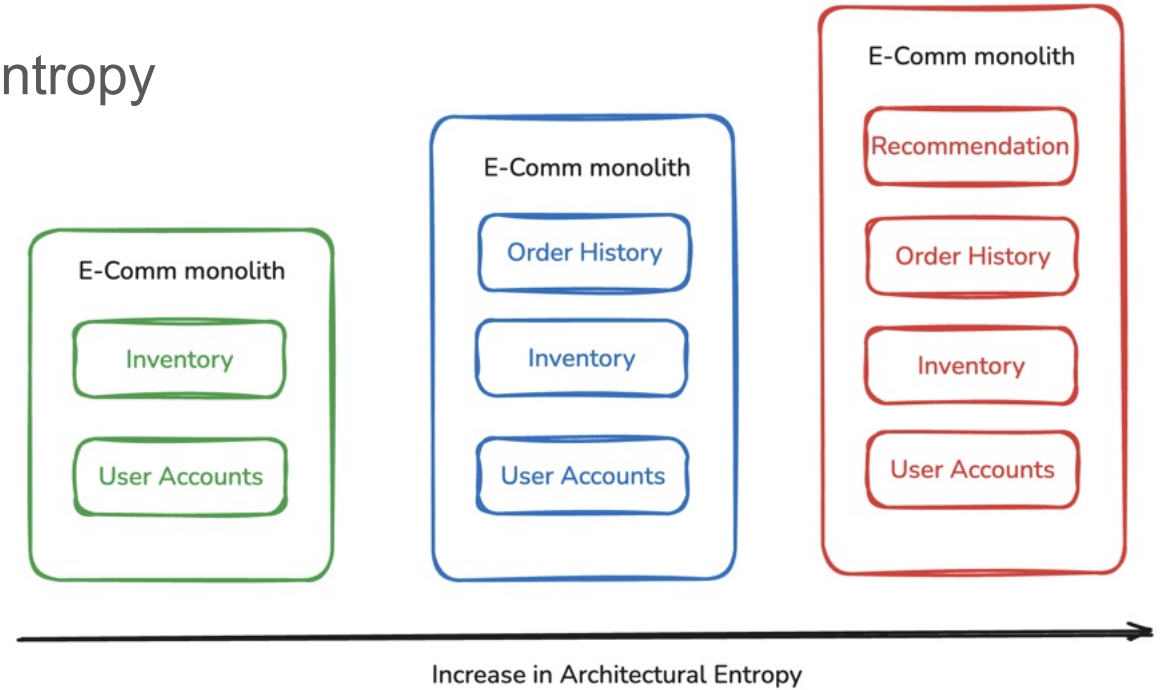

Legacy… but why?!?

- Advancement in Technology
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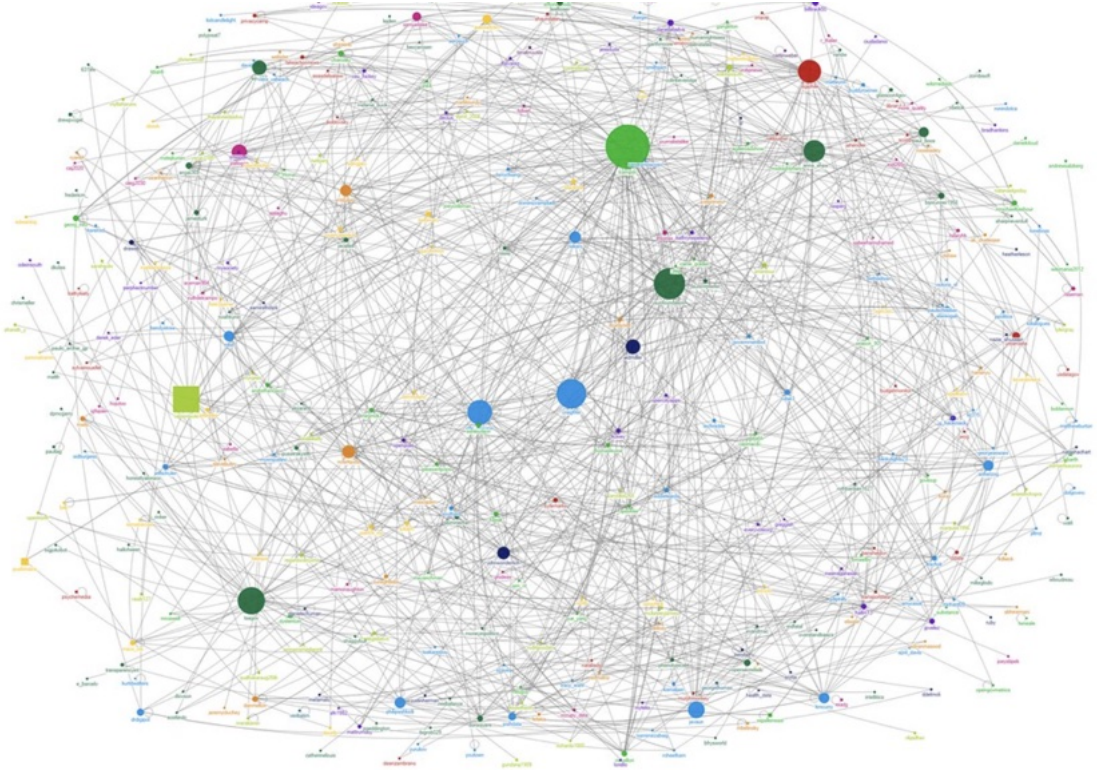
- Law of Architectural Entropy

Do we proactively improve legacy systems?

“Big ball of mud”



Technical Renovation

Technical Renovation: What?

Act of upgrading or replacing outdated systems and technology to improve system health

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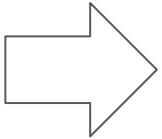
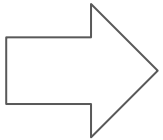
What about Refactoring??

Refactoring vs Technical Renovation



Refactoring vs Technical Renovation



Refactoring is important!

Disclaimer: Don’t sleep on an opportunity to refactor

Technical Renovation: When?

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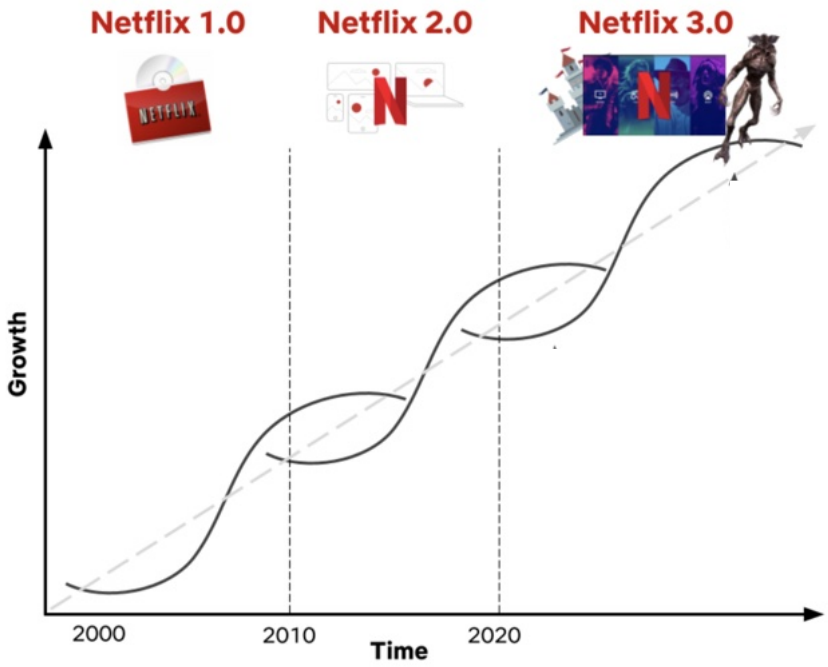
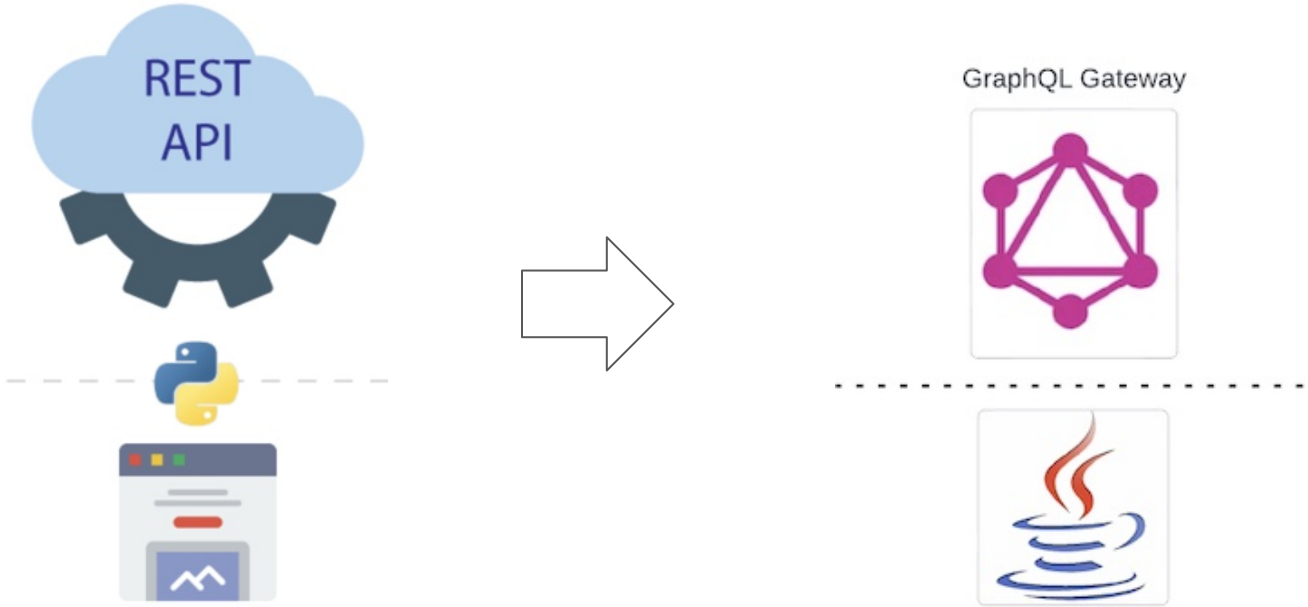
- Diverging Business Needs



Technical Renovation: When?

- Diverging Business Needs
- Modernize Technology Stack



Technical Renovation: When?

- Diverging Business Needs
- Modernize Technology Stack
- Accumulation of Tech Debt

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The Guiding Principles for Tech Renovation

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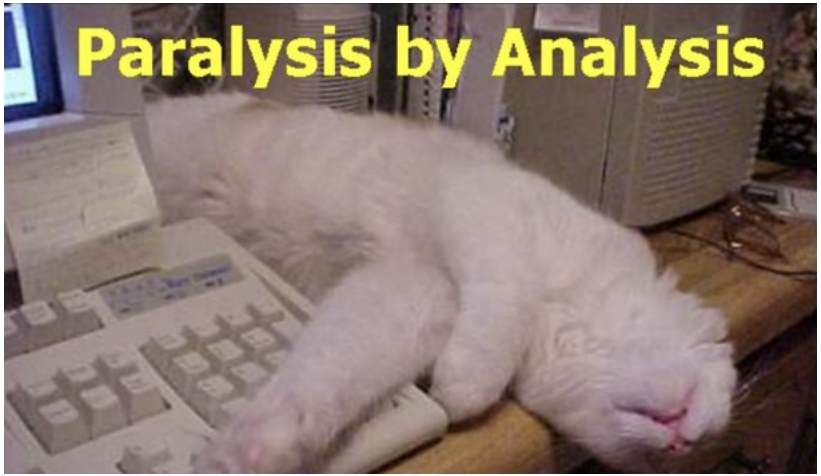

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The Guiding Principles for Technical Renovation

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2. Evolutionary Architecture

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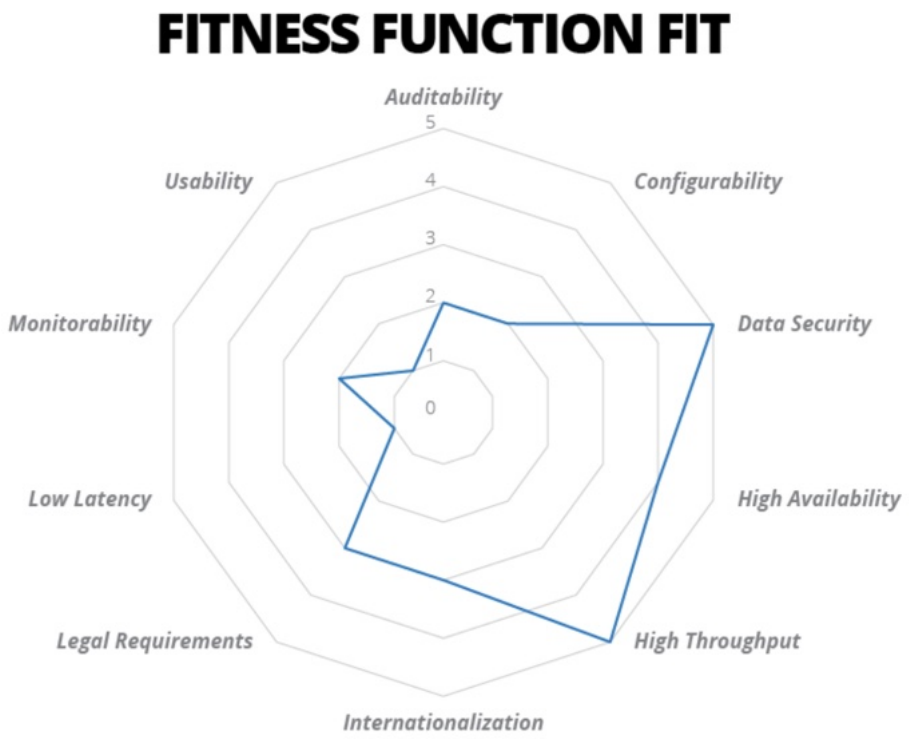
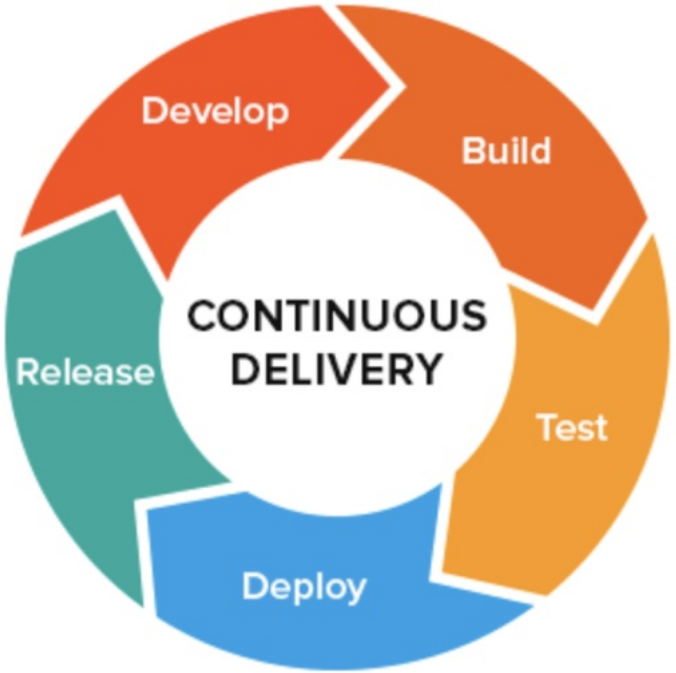
- Identify Fitness Functions



Ref: Building Evolutionary Architecture, Neal Ford, Rebecca Parsons

2. Evolutionary Architecture

- Identify Fitness Functions
- Continuous Delivery & Experimentation



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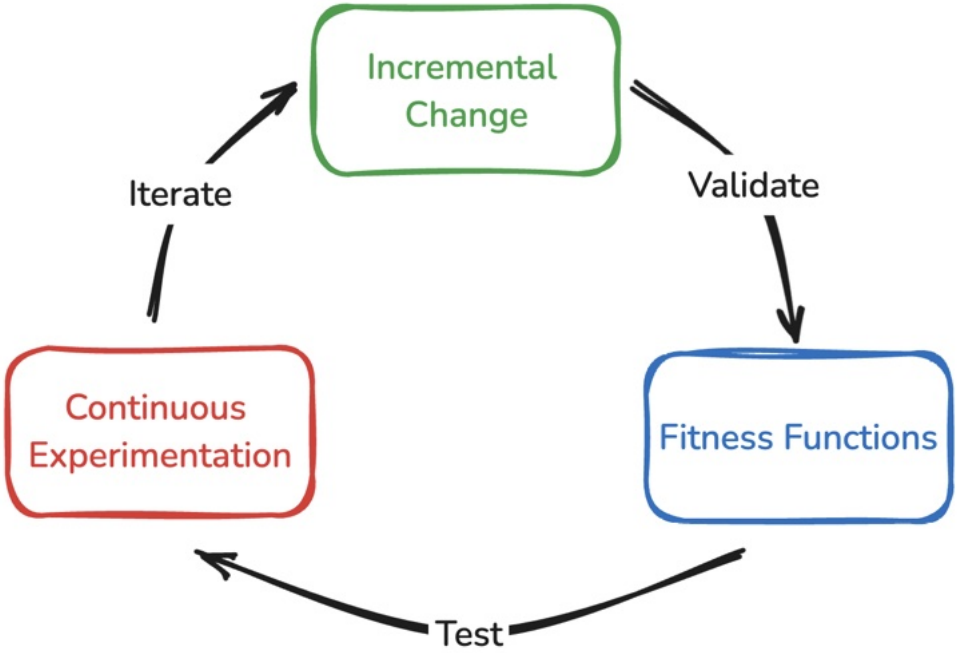

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3. Innovating while Renovating

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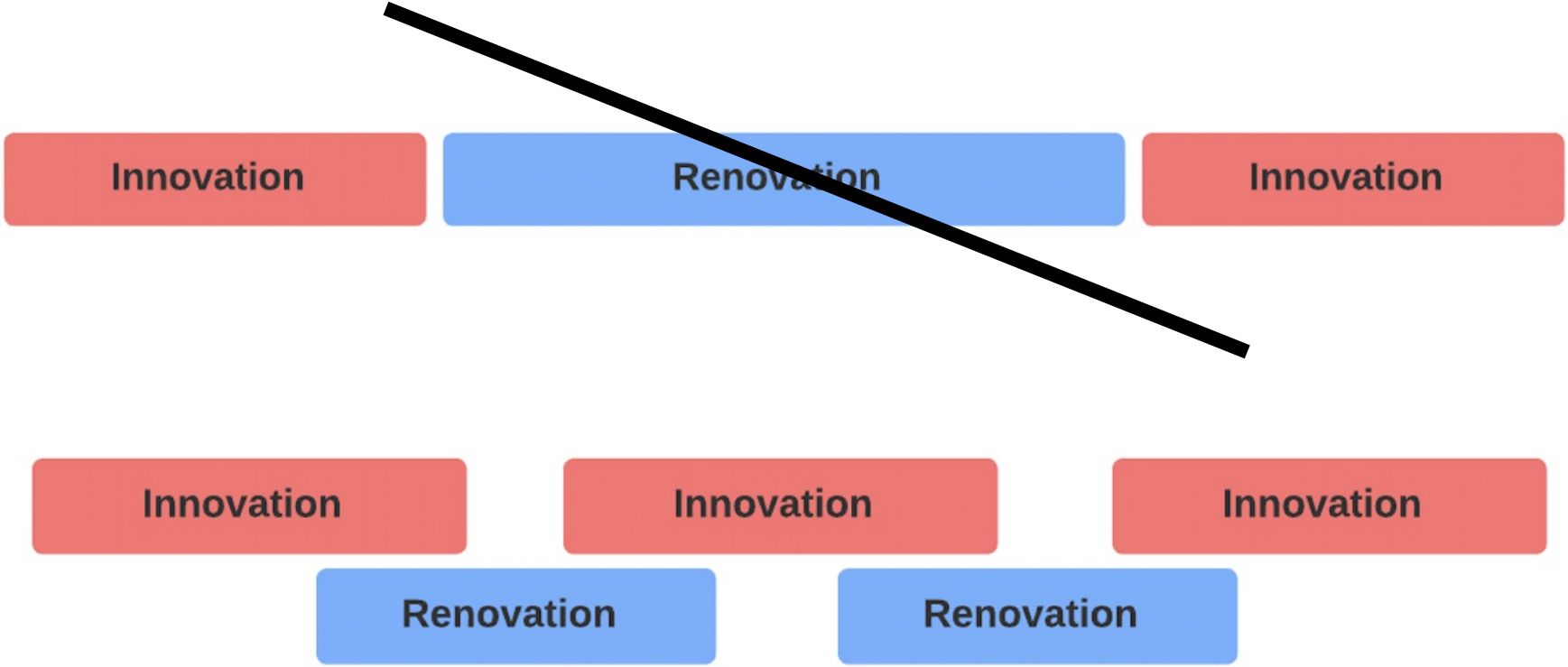

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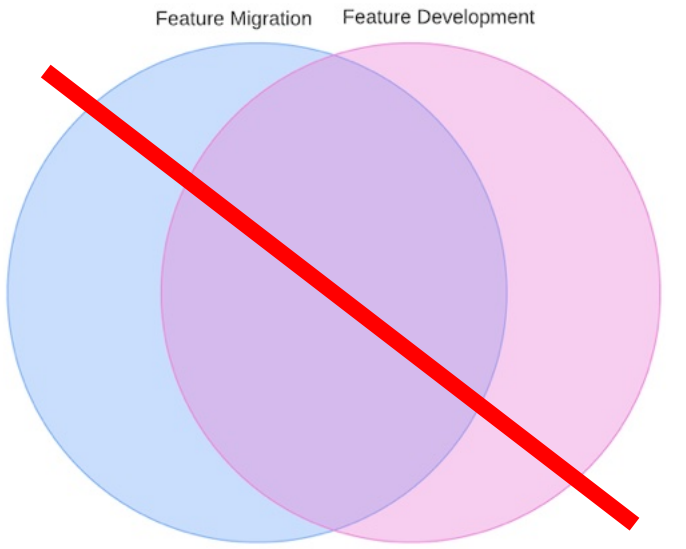

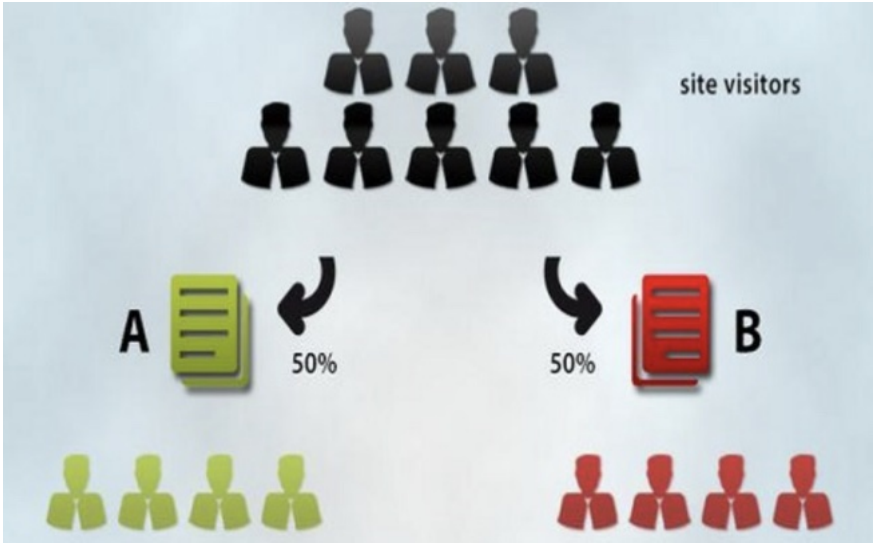

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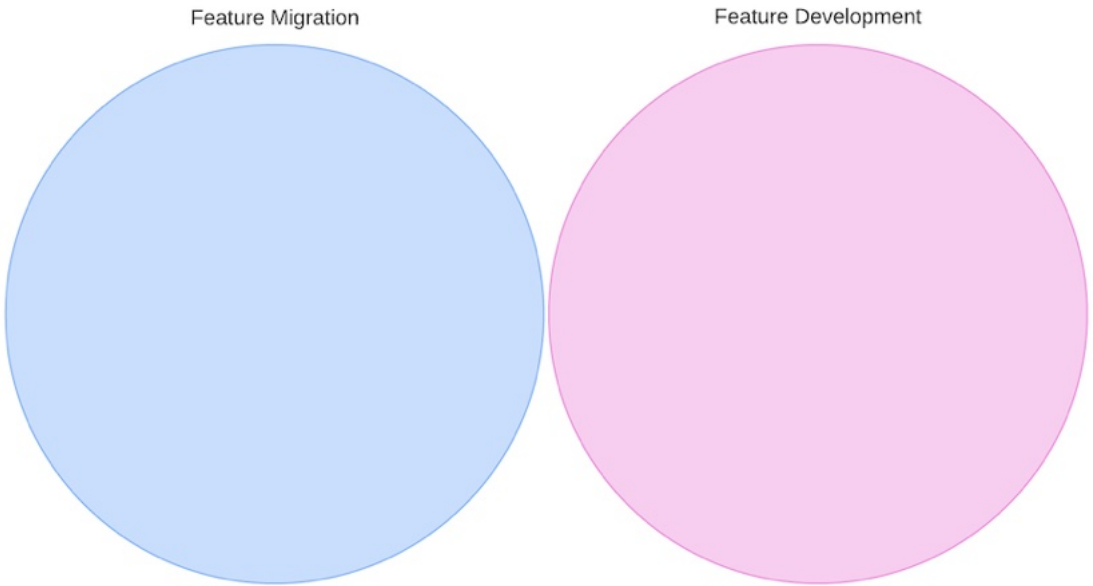

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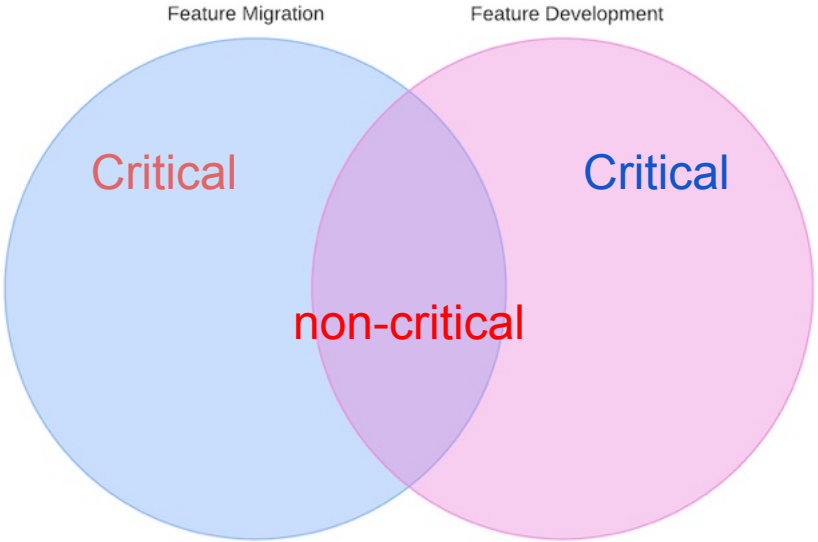

The Guiding Principles for Technical Renovation

1. “Make it work, Make it right, Make it fast”
2. Evolutionary Architecture
3. Renovating while Innovating
4. Deprecation driven development

4. Deprecation Driven Development

What are we ~~losing~~ gaining by deprecating

4. Deprecation Driven Development

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1. “Make it work, Make it right, Make it fast”
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5. Intentional Organization Design

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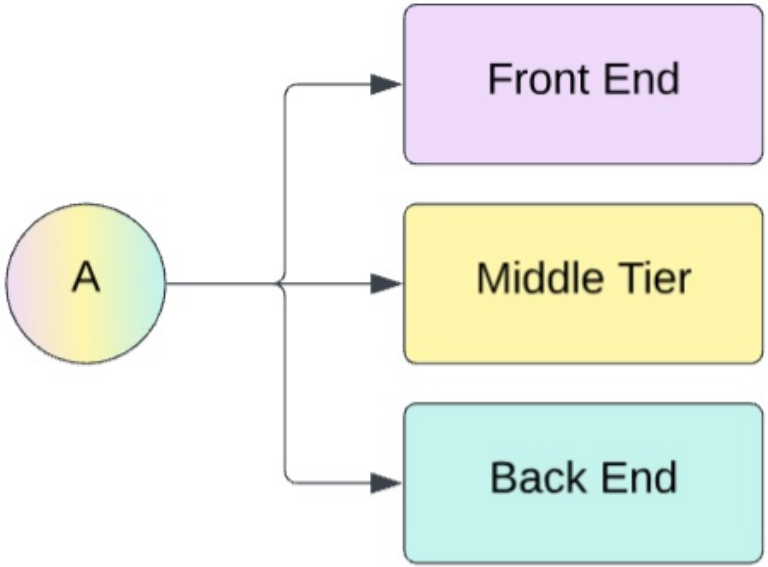
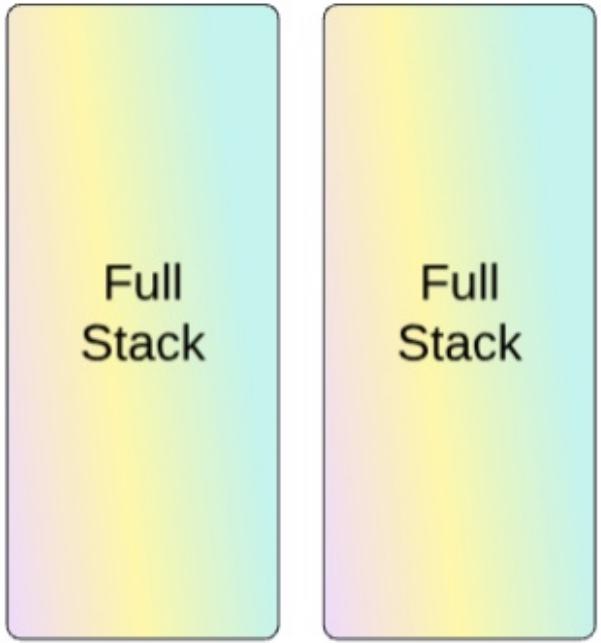
Innovation = Discovery + Iteration

5. Intentional Organization Design



Design A

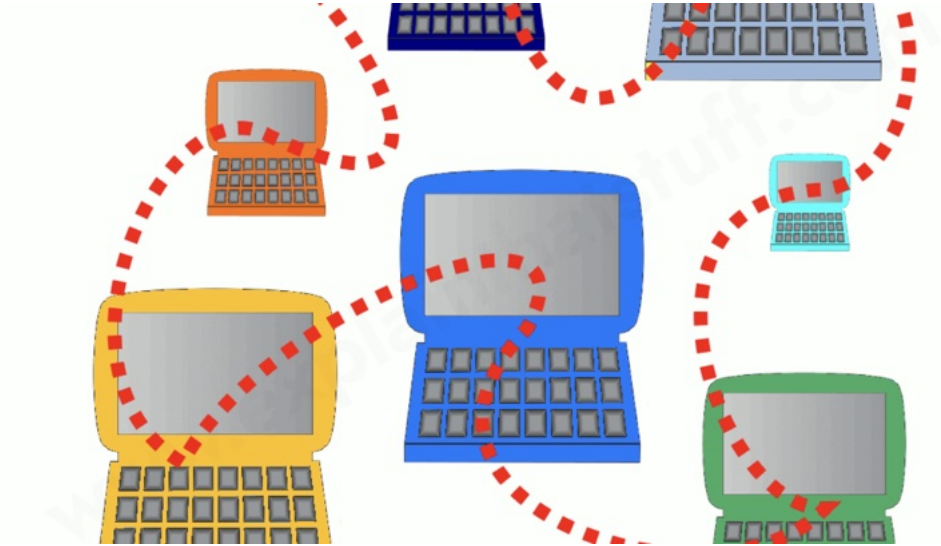


Design B

Conway’s Law

The structure of software will mirror the structure of the organization that built it

5. Intentional Organization Design



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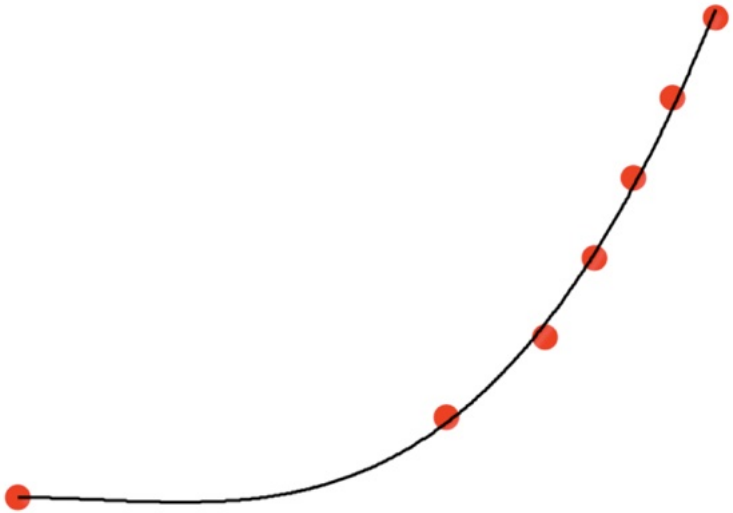
Embracing the Growth Mindset

Questions?

Unexpected Longevity



All ~~characters~~ examples appearing in this ~~work~~ presentation are fictitious, any resemblance to ~~real persons~~ ongoing projects, ~~living or dead~~, existing or deprecated services is purely coincidental

Improvements

- Public speaking coach
- Identify the key message / take away and focus the entire talk on that
- All takeaways need to be served on a silver platter
  - Bonus if you can set it up for anticipation
- Listen to books and read

Now, it is not always possible to remove all of these challenges as they are what constitutes the reality of this role in many organizations (large corporations especially). However, there are ways to manage and minimize them to a degree that does not take away from your effectiveness and enjoyment of the role.

As with clothes and hairstyles, software can go out of fashion. But the risks of outdated software are far greater than big 80s hair. Outdated software can cause massive customer churn, cost unnecessarily high amounts of money to maintain, and put both business and customer data at risk. This is why every year, thousands of companies take on software modernization projects to update the products they offer customers as well as their internally developed systems for customer management or business processes. In this guide, we put our experience updating software for large corps and government agencies to work for you.