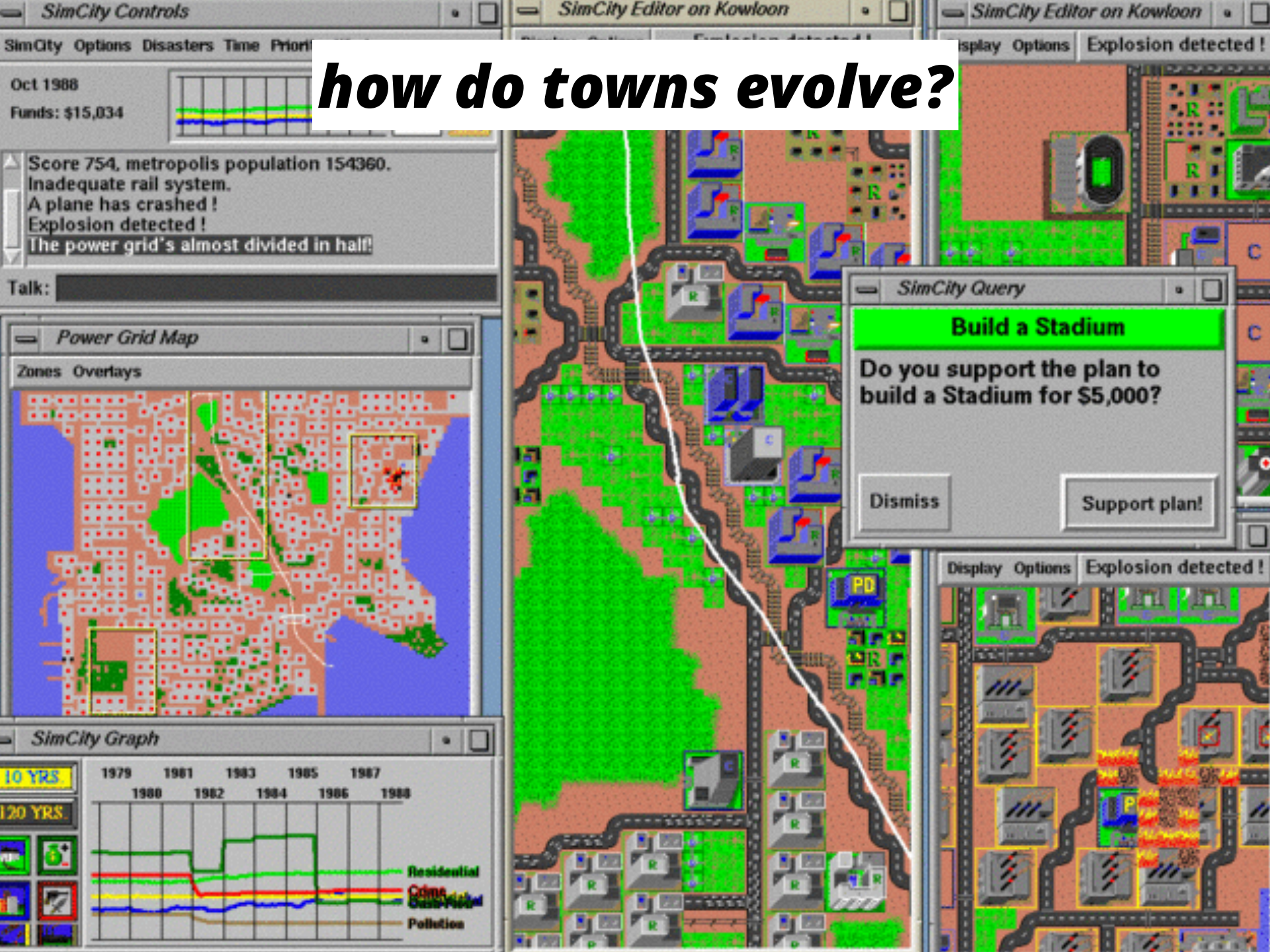
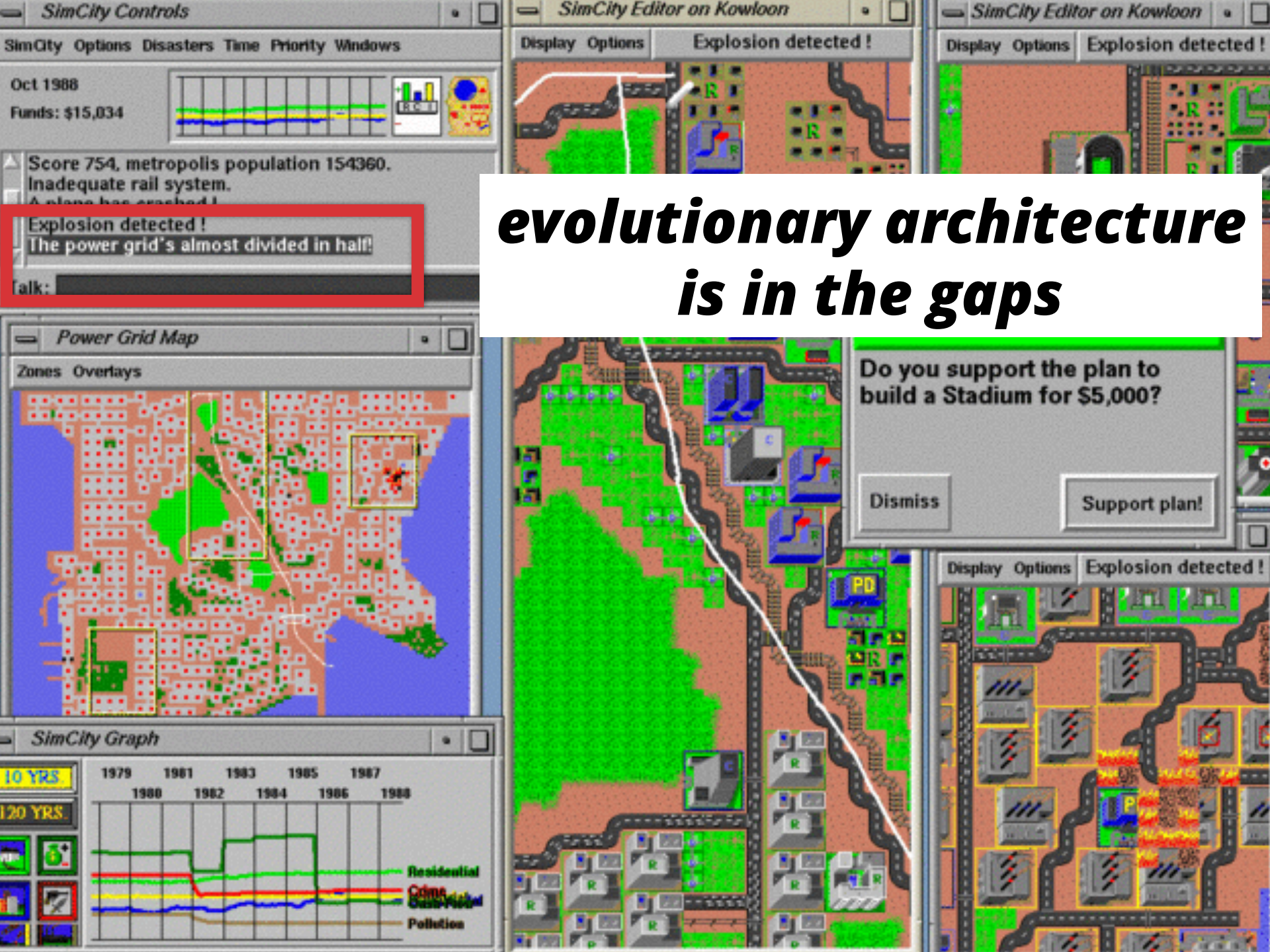
Evolutionary Architecture

“Just enough architecture”


how do towns evolve?
SimCity Controls
SimCity Options Disasters Time Priorit
Oct 1988
Funds: $15,034
Score 754, metropolis population 154360.
Inadequate rail system.
A plane has crashed !
Explosion detected !
The power grid's almost divided in half!
Talk:
Power Grid Map
Zones Overlays
SimCity Graph
10 YRS
120 YRS
1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Residential
Pollution
SimCity Editor on Kowloon
SimCity Editor on Kowloon
Display Options
Explosion detected !
SimCity Query
Build a Stadium
Do you support the plan to build a Stadium for $5,000?
Dismiss
Support plan!
Display Options
Explosion detected !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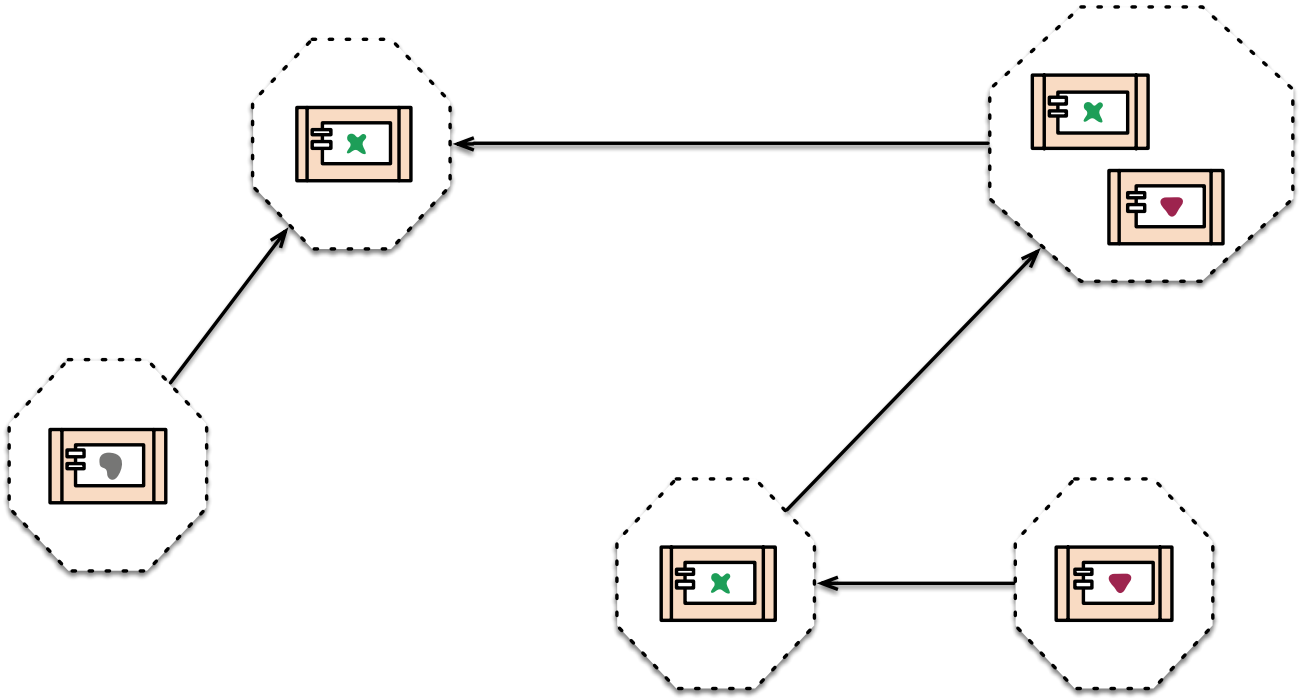
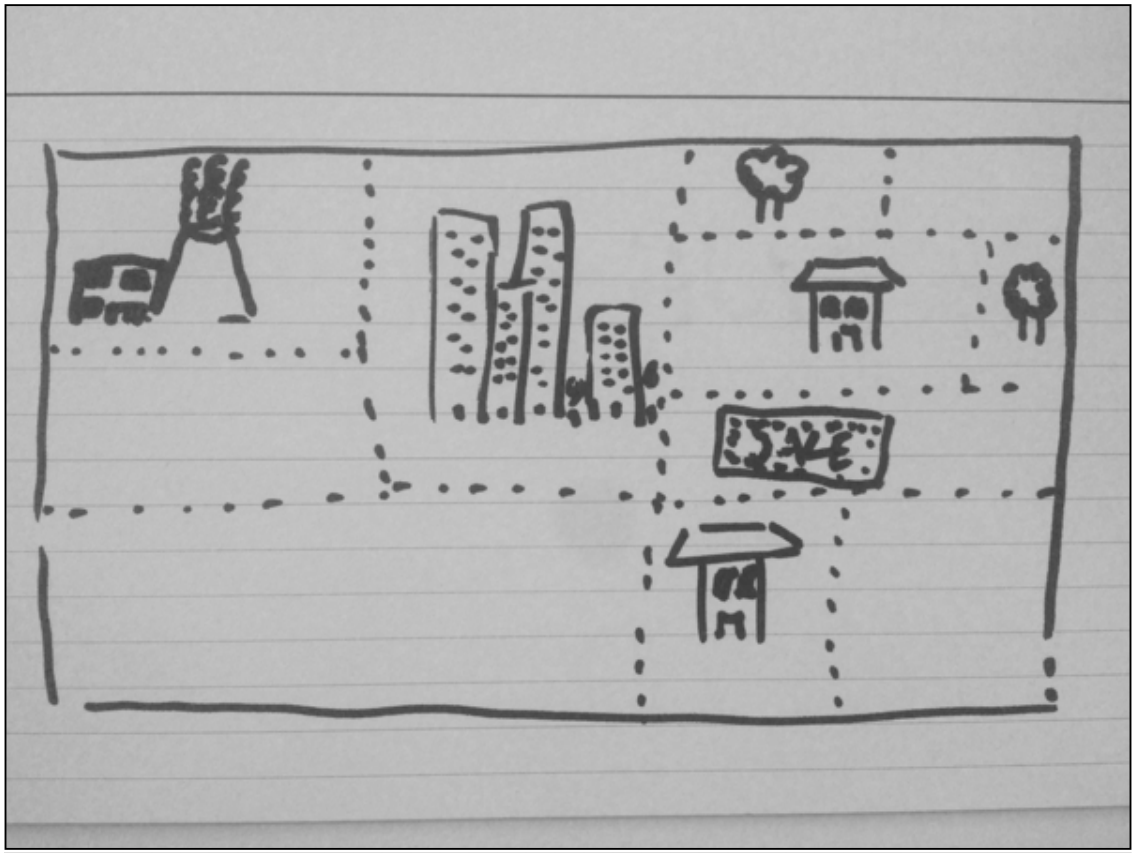
emergent design is within the zones

ALLOW BUSINESS CAPABILITIES TO EVOLVE



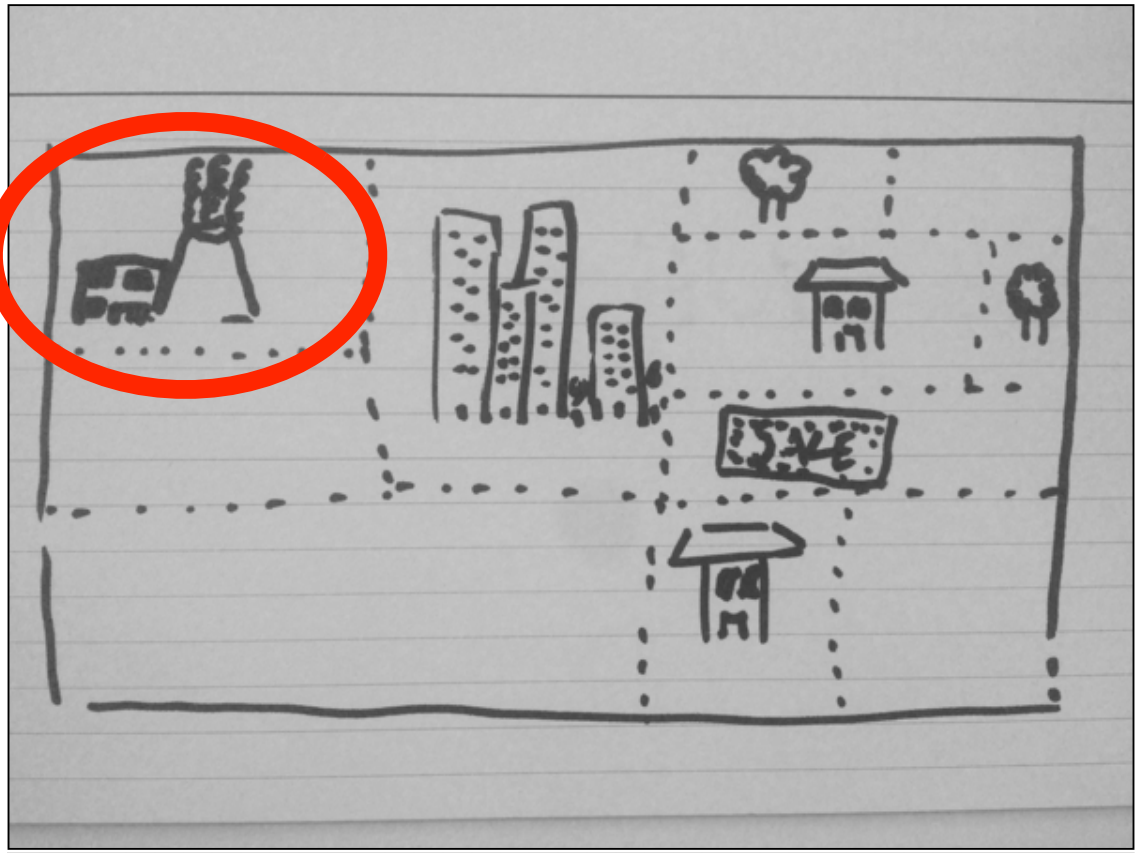
HAVE A ROUGH IDEA ABOUT WHAT YOU WANT TO BUILD, AND DEFER DECISIONS UNTIL YOU KNOW MORE


TOWN
PLAN

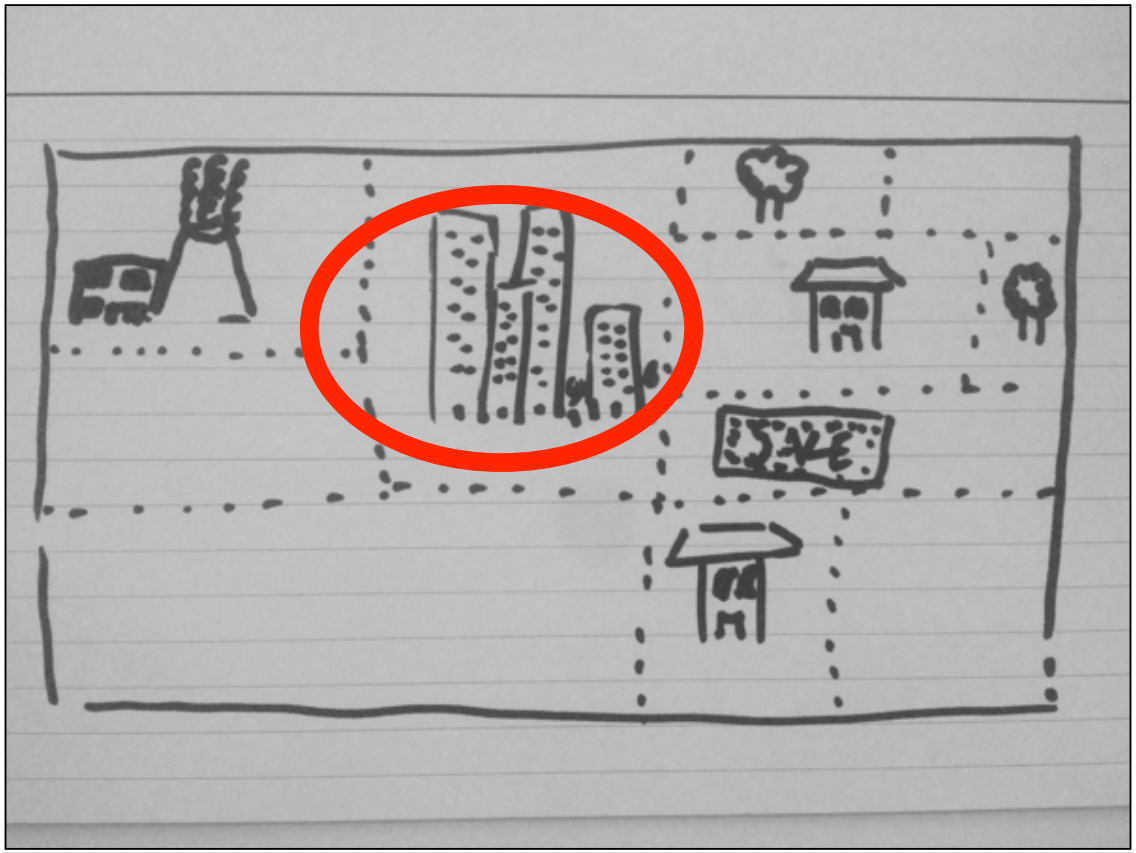


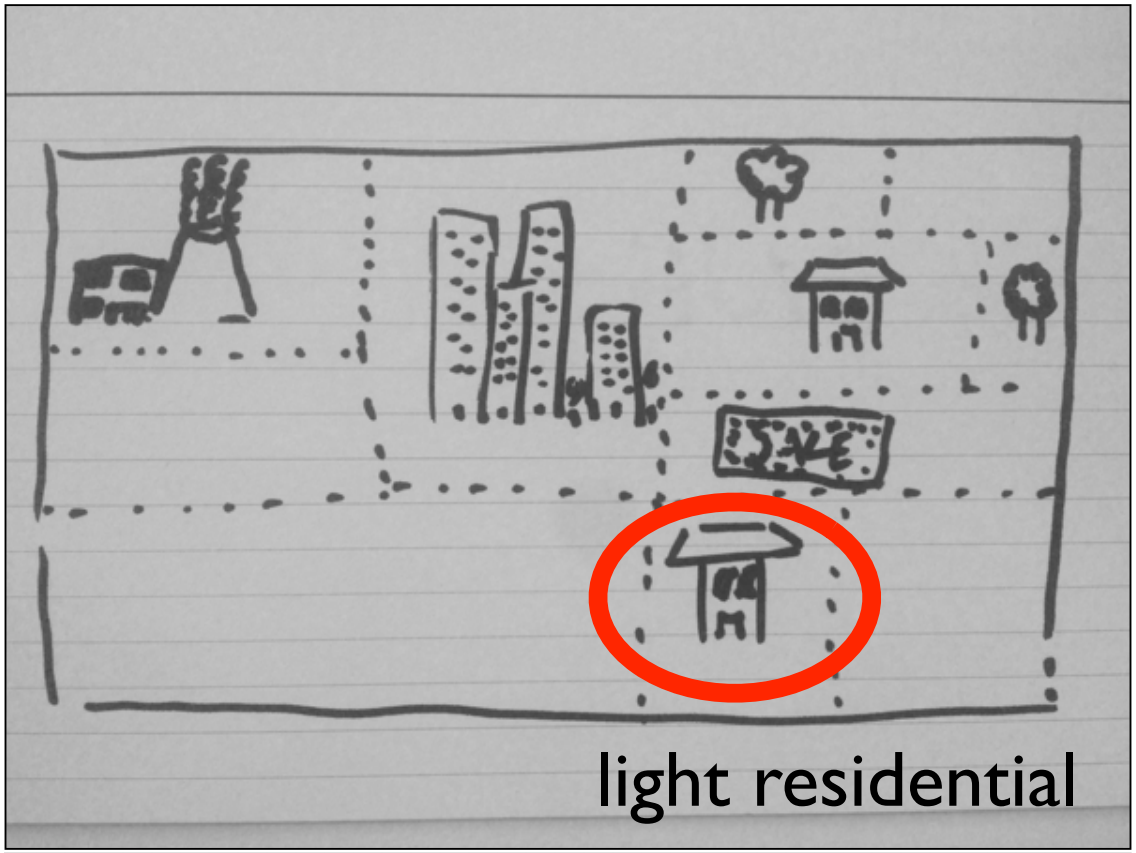
Towns are Zoned

heavy industrial

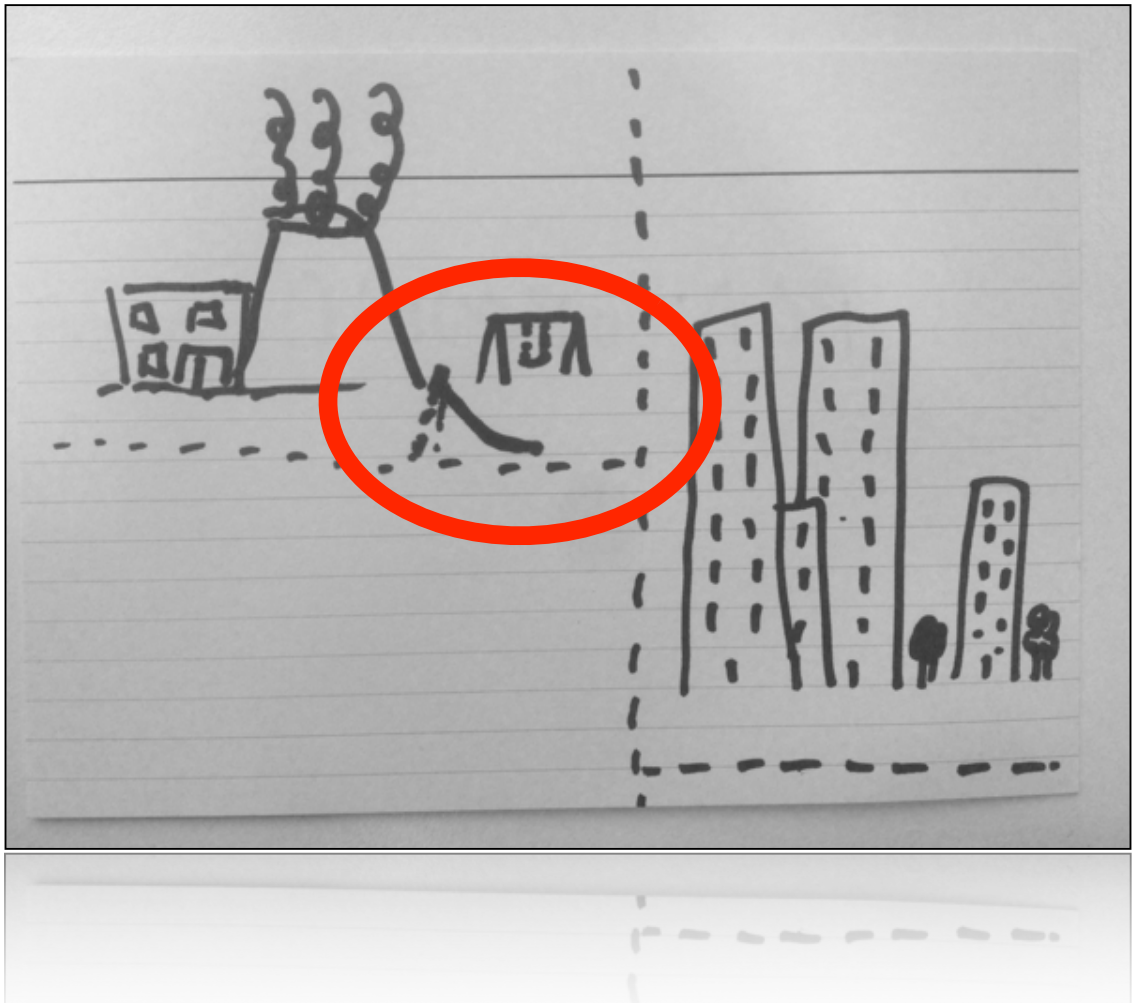


commercial



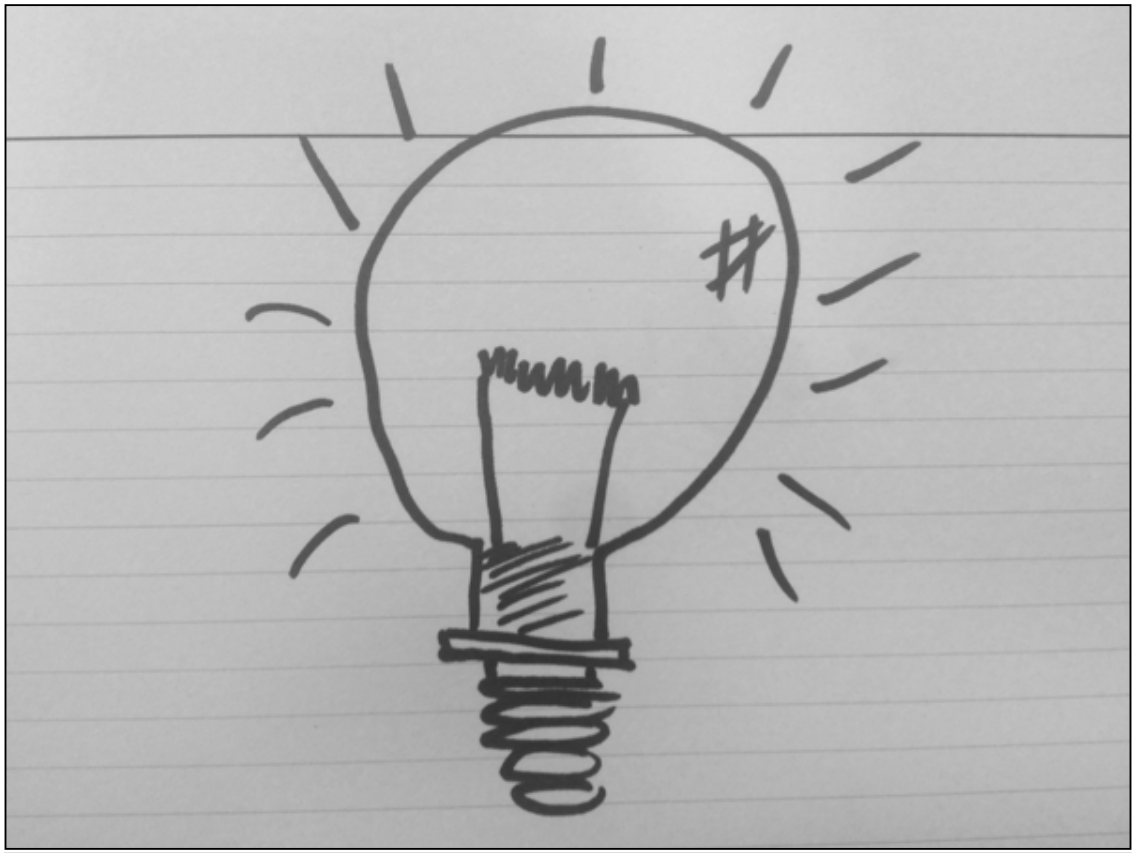

light residential

Would you build a playground next to a power station?

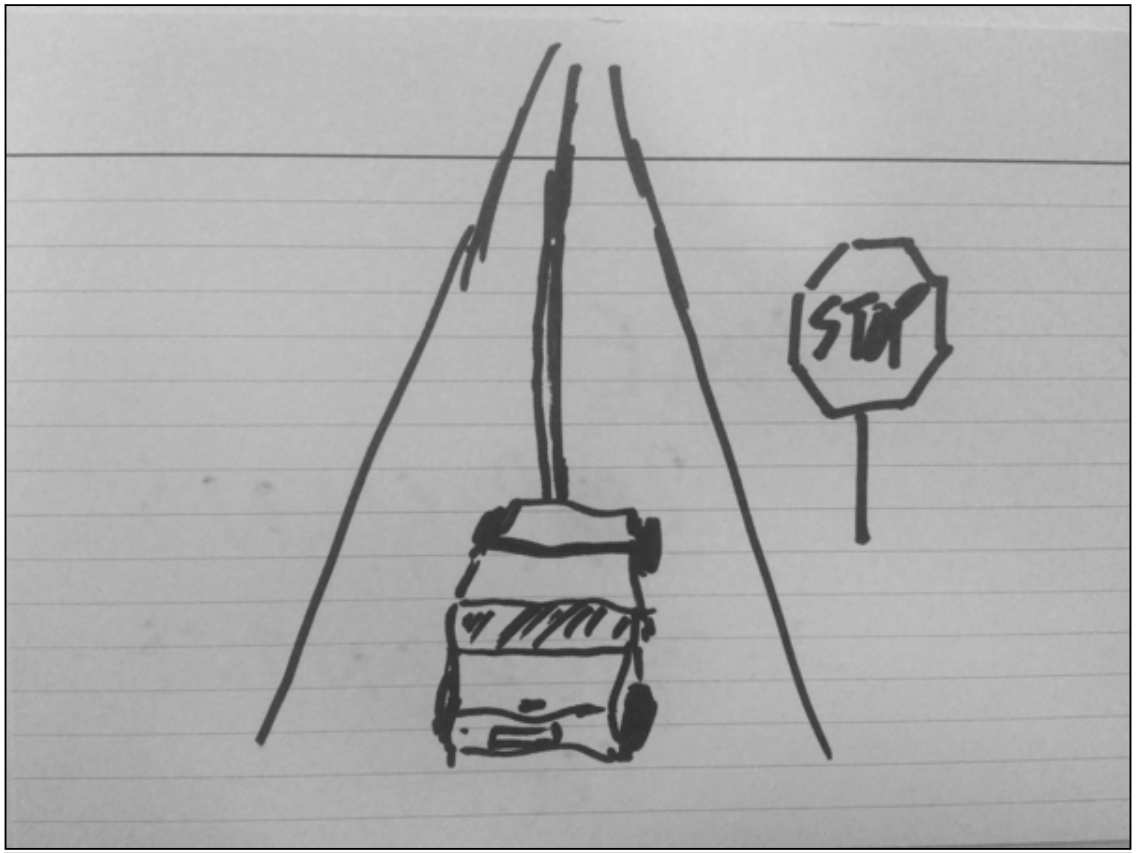


Town share utilities

Everyone uses 240V DC right?

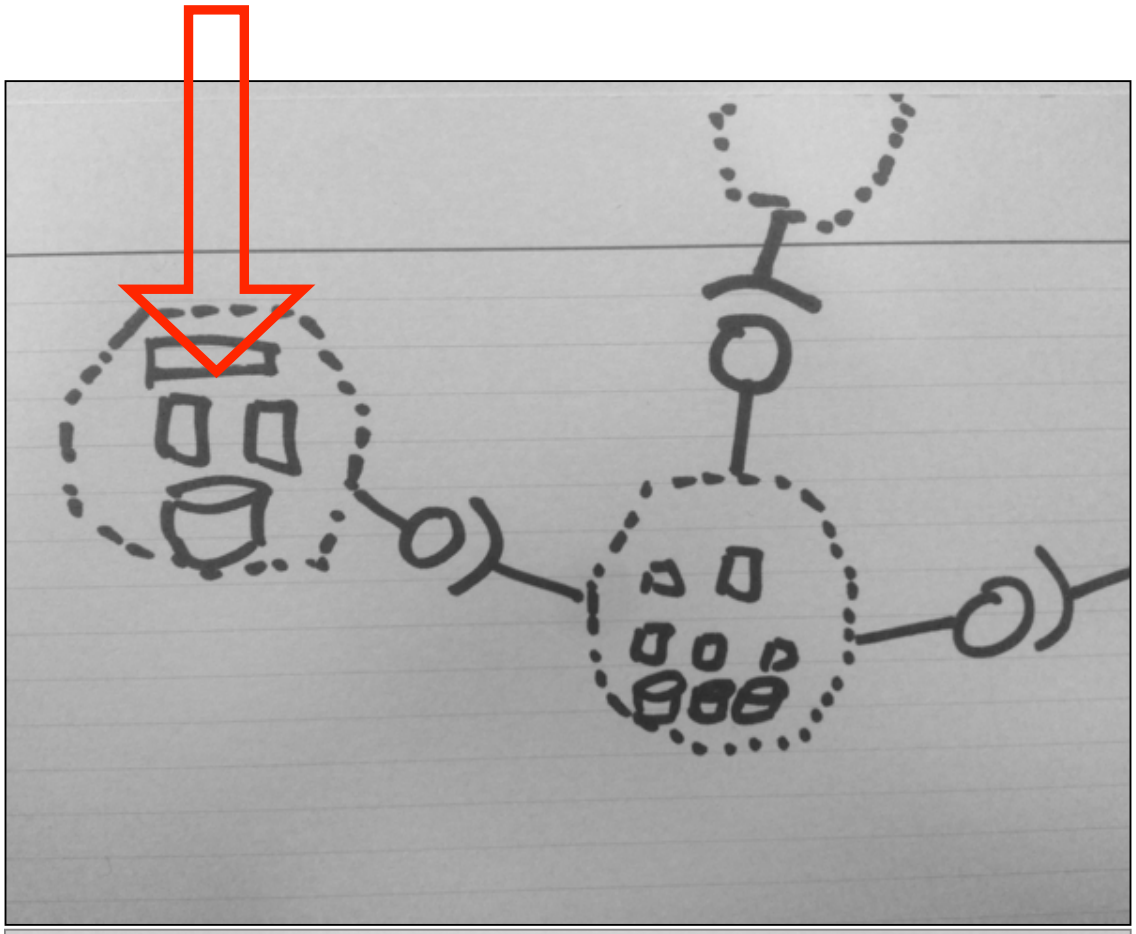


and it would be a bad idea not to use the same language for stop signs...



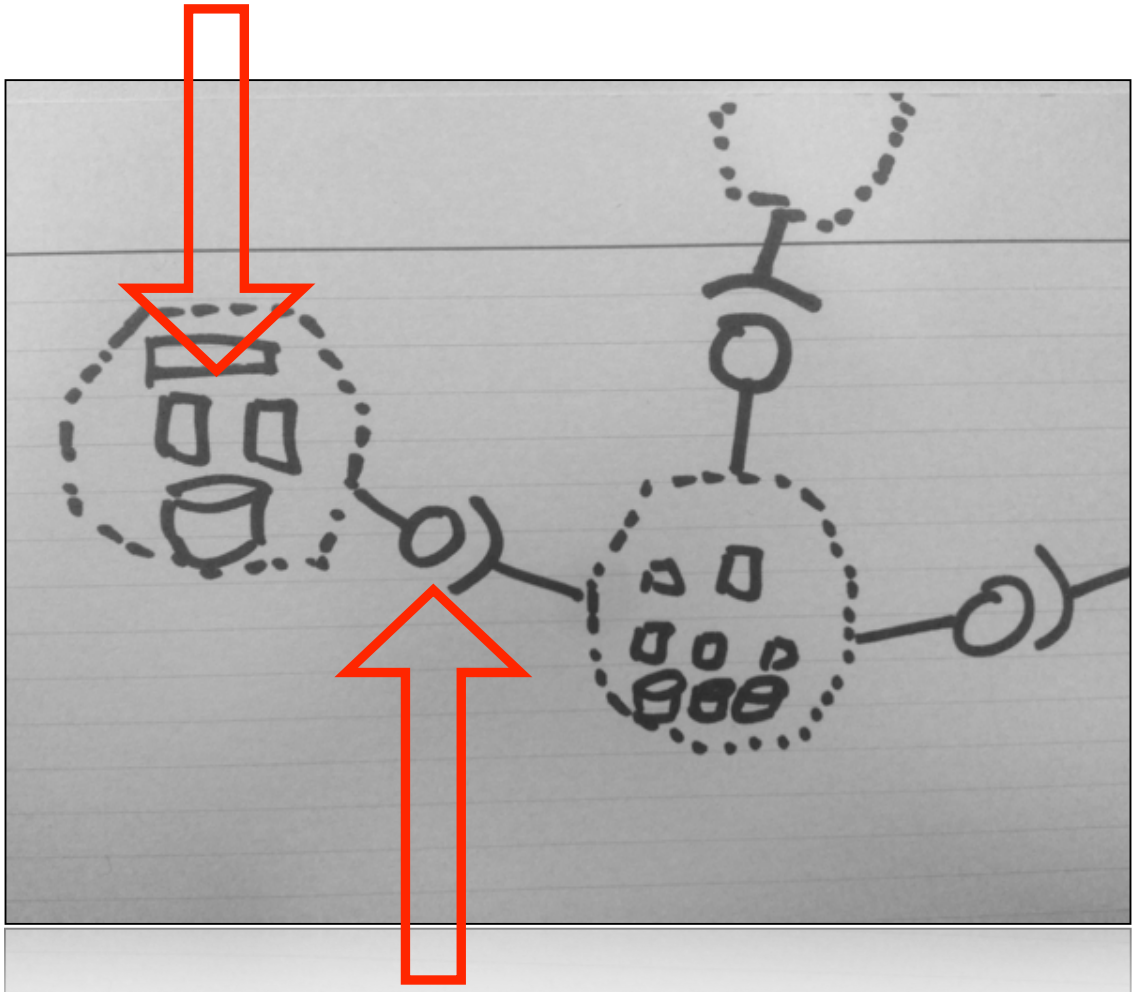

CAPABICITY
MAP

emergent design is within the **zones**



evolutionary architecture is in the **gaps**

emergent design is within the **zones**



evolutionary architecture is in the **gaps**

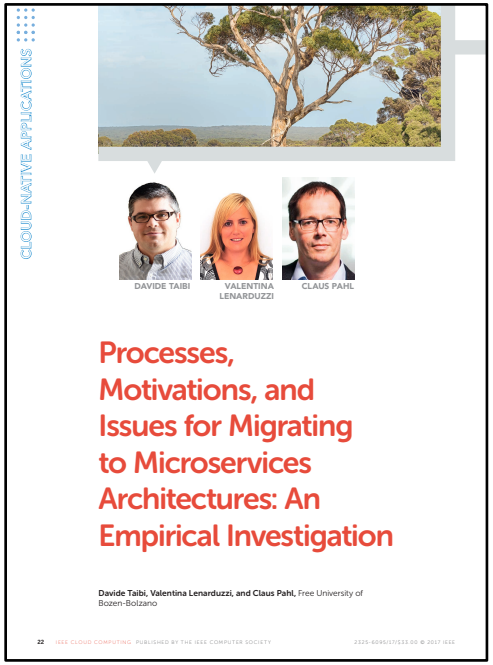
Think about

- Concentrate on the business capabilities
  - technical acronyms make us think the wrong way
- What are the common features? Integration methods?
- What different types of data live where?

Microservices Migration Process

21 companies interviewed

Goal: Understand the migration process



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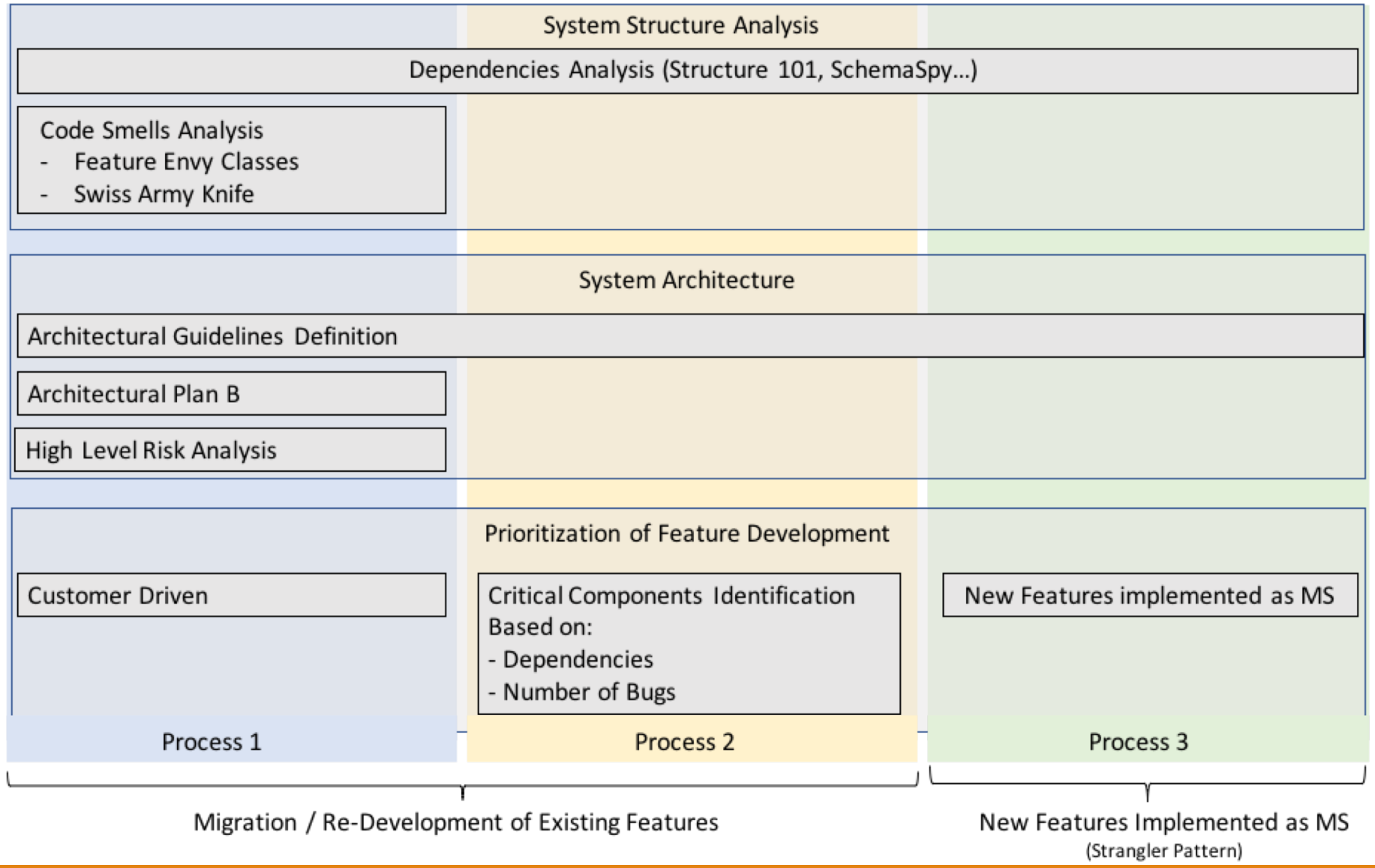
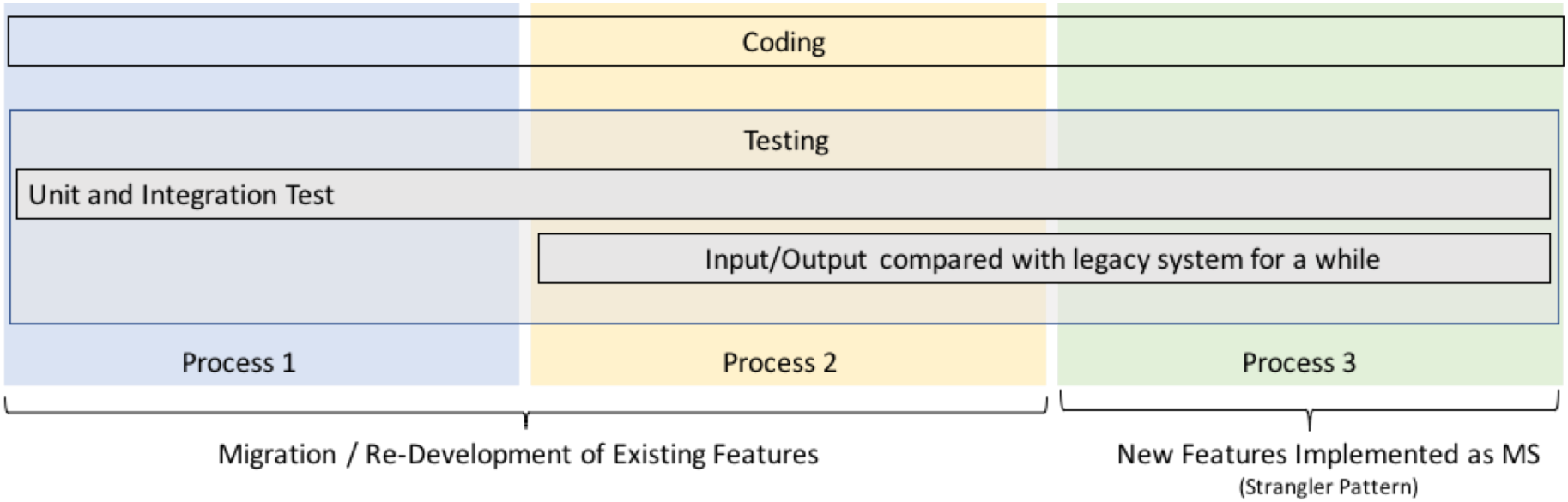
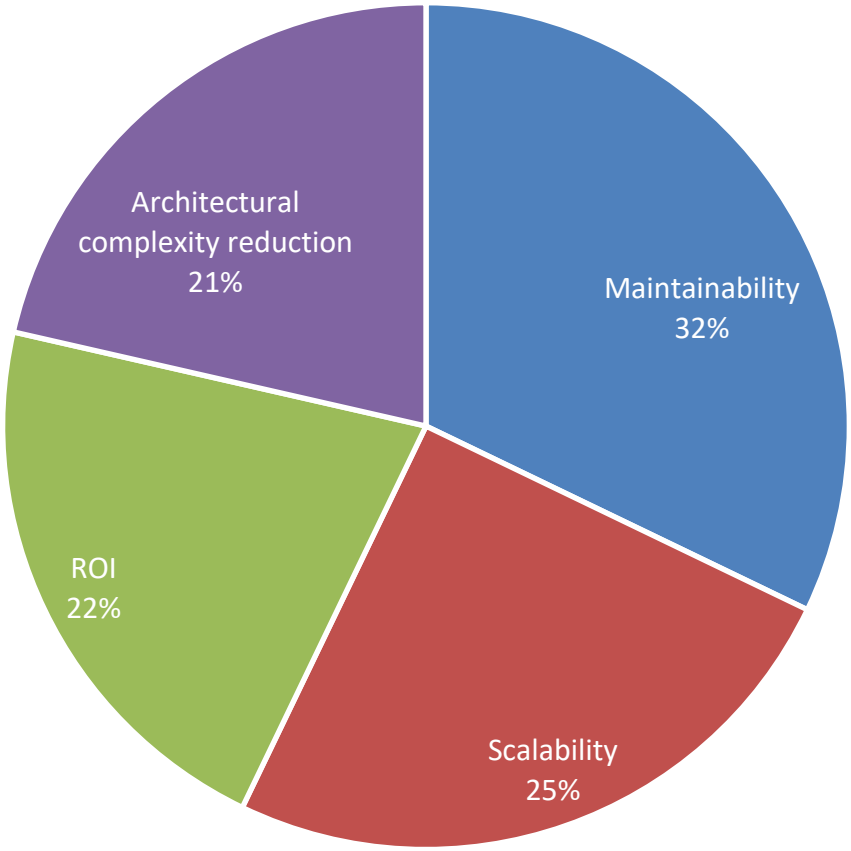
Migration Process (1/2)



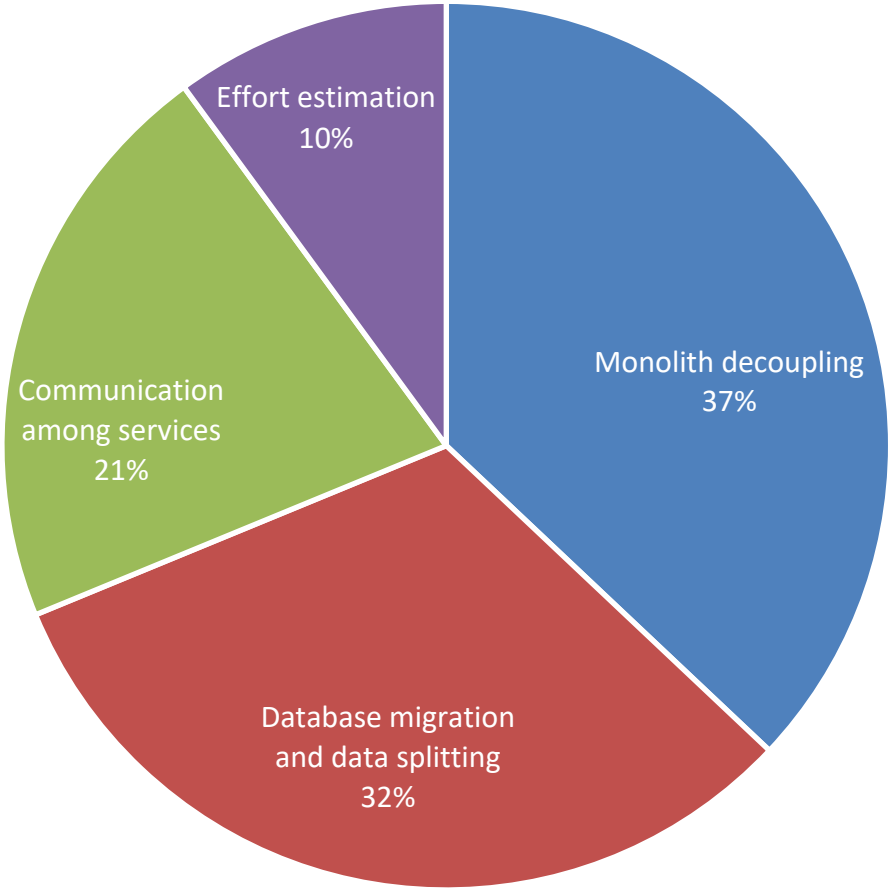
Migration Process (2/2)



Main Benefits



Main Issues


Effort estimation
10%
Monolith decoupling
37%
Communication
among services
21%
Database migration
and data splitting
32%

Main Issues Identified

Technical Issues

- Decoupling from the monolithic system
- Database migration and data splitting
- Communication among services
- Service orchestration complexity

Main Issues Identified

Effort-Related issues

- Effort estimation and overhead
  - effort at least 20% higher
- Effort required for the DevOps infrastructure
- Effort required for library conversion

Main Issues Identified

Other issues

- People's minds
- ROI achieved in longer time (or never) compared to monolithic systems

Migration Issues

Issues	Entire Dataset		Migration Consultant		Others	
	#	Median	#	Median	#	Median
Monolith decoupling	7	3	/	/	7	3
Database migration and data splitting	6	4	/	/	6	4
Communication among services	4	3.5	2	4	2	3
Effort estimation	2	4	2	4	/	/
DevOps infrastructure requires effort	2	4	/	/	2	4
Library conversion effort	2	4	/	/	2	4
People's minds	2	4	1	4	1	4
Expected long-term return on investment (ROI)	2	3	1	3	1	3

Expected Benefits

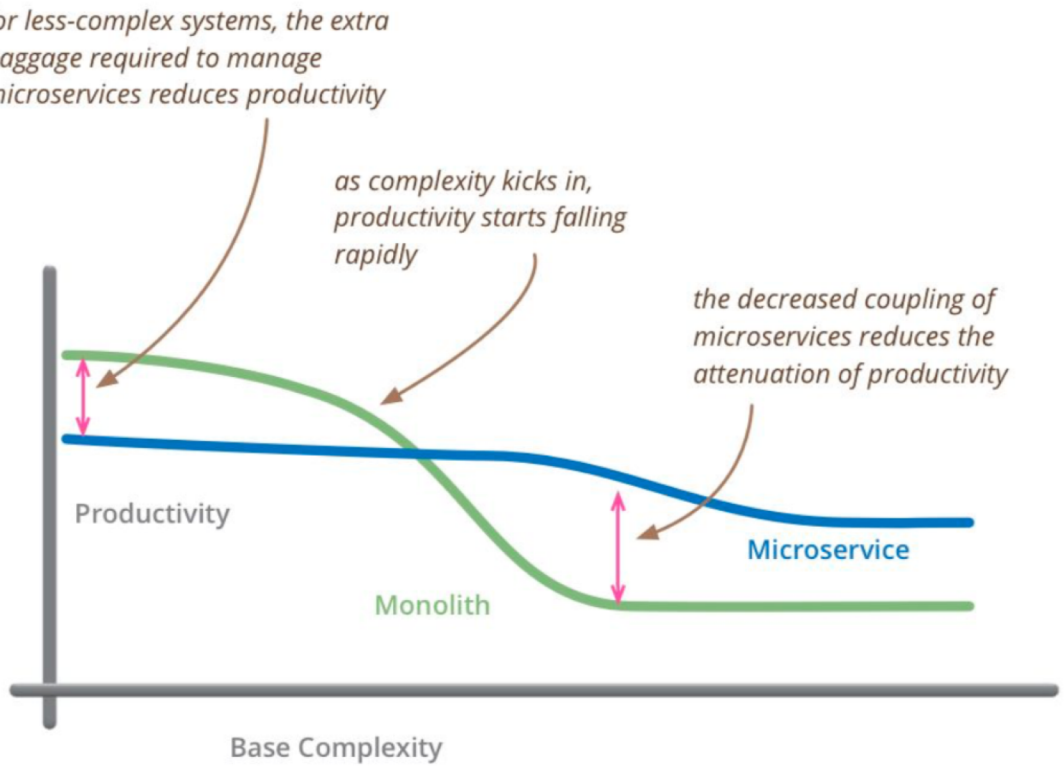
Benefits	Entire Dataset		Migration Consultant		Others	
	#	Median	#	Median	#	Median
Maintainability improvement	9	4	5	4	4	3.5
Scalability improvement	7	2	5	2	2	4
ROI	6	4	/	/	6	4
Architectural complexity reduction	6	3	/	/	6	3
Simplifies distributed work	2	3	2	3	/	/
Performance improvement	2	1	2	1	/	/
Testability	2	3	/	/	2	3
Separation of concerns	2	3	2	3		
Single clear responsibility	2	1	2	1	/	/
Suitability for Scrum	2	3	/	/	2	3
System understandability	1	4	1	4	/	/

The microservices style introduces its own set of (distributed systems related) complexities:

- automated deployment
- continuously monitoring
- dealing with failure
- eventual consistency
- security

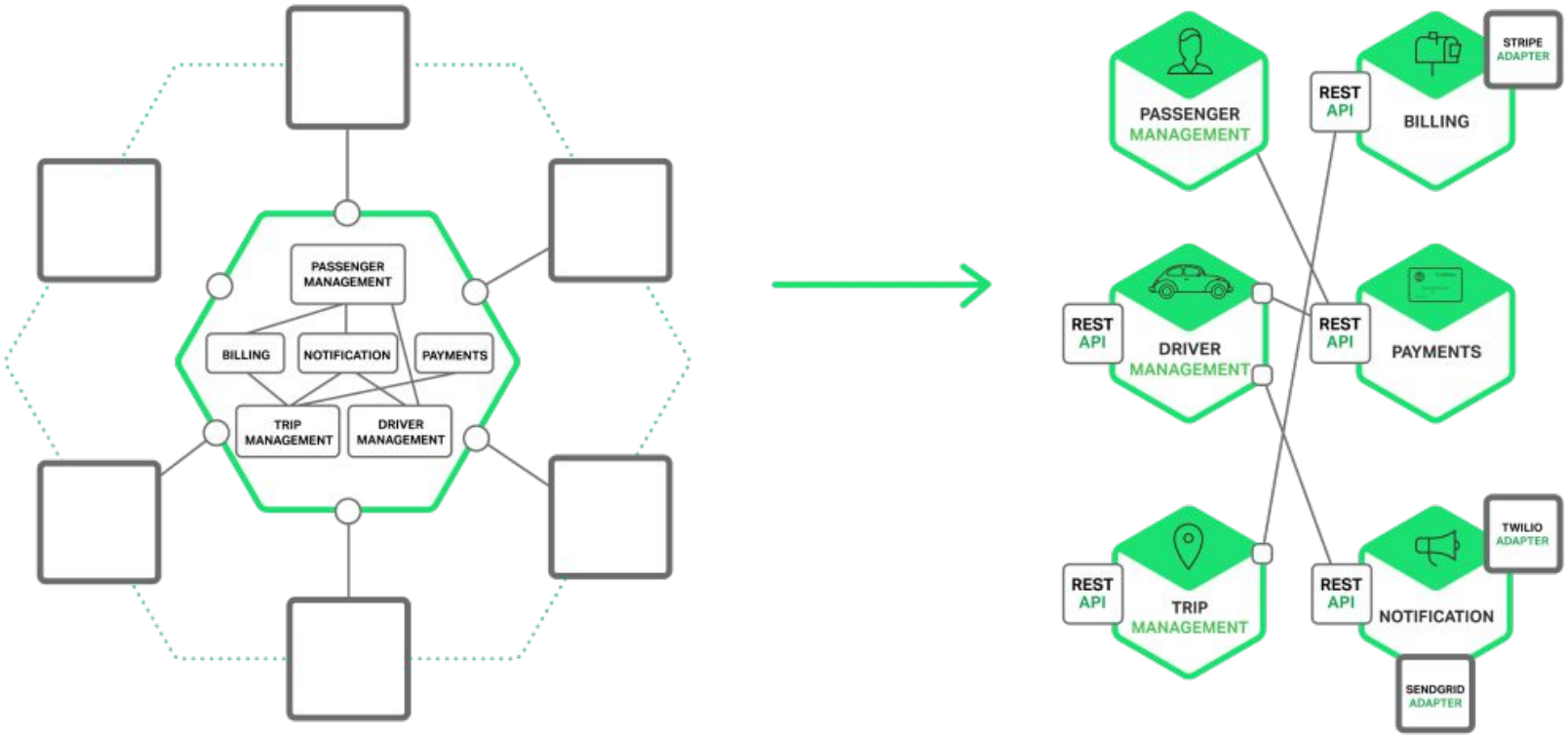
"The majority of software systems should be built as a single monolithic application. Do pay attention to good modularity within that monolith. Don't even consider microservices unless you have a system that's too complex to manage as a monolith."

-- Martin Fowler



source: https://martinfowler.com/bliki/MicroservicePremium.html

Microservices Example: Uber



Microservices Example: SoundClou