

Modeling and Analysis: Life Cycle Models

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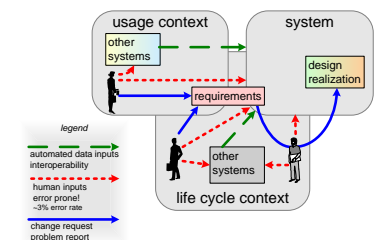
Abstract

Products and enterprises evolve over time. This presentation explores the impact of these changes on the system and on the business by making (small and simple) models of life cycle aspects.

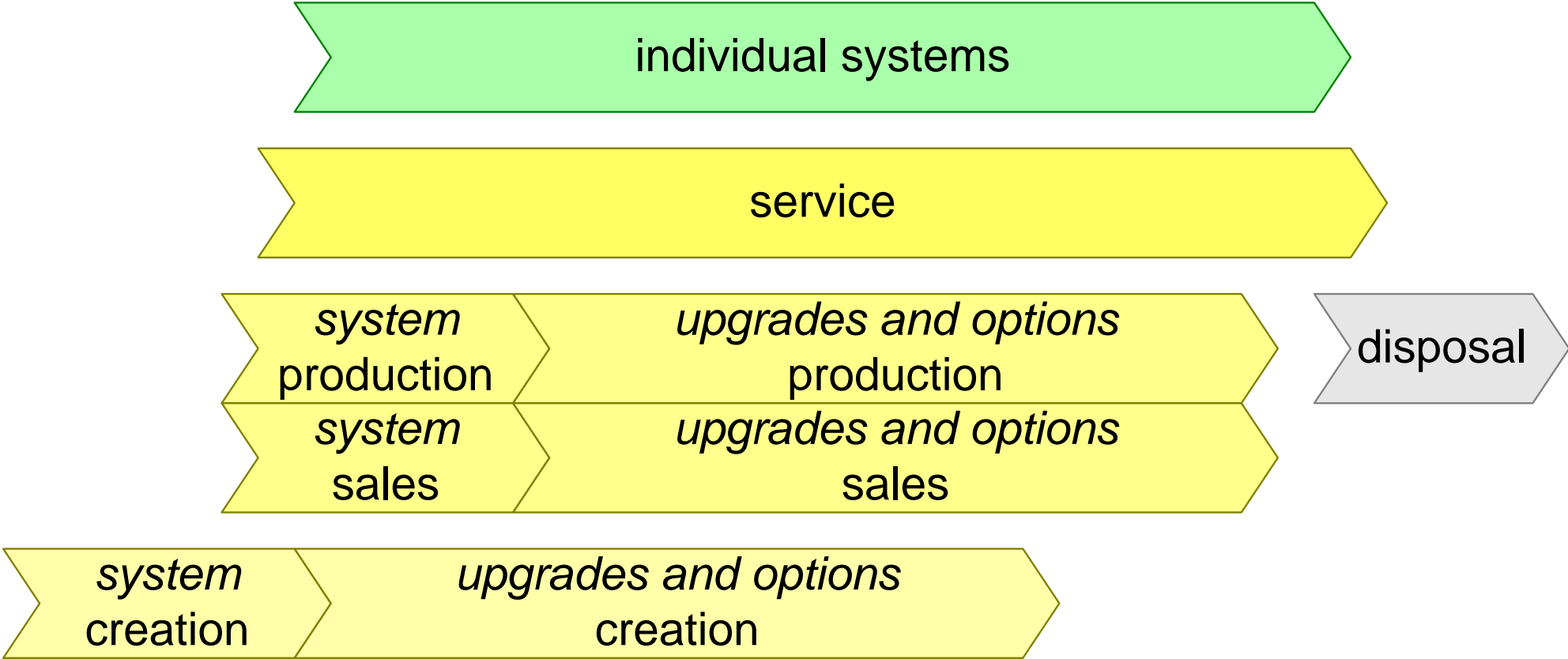
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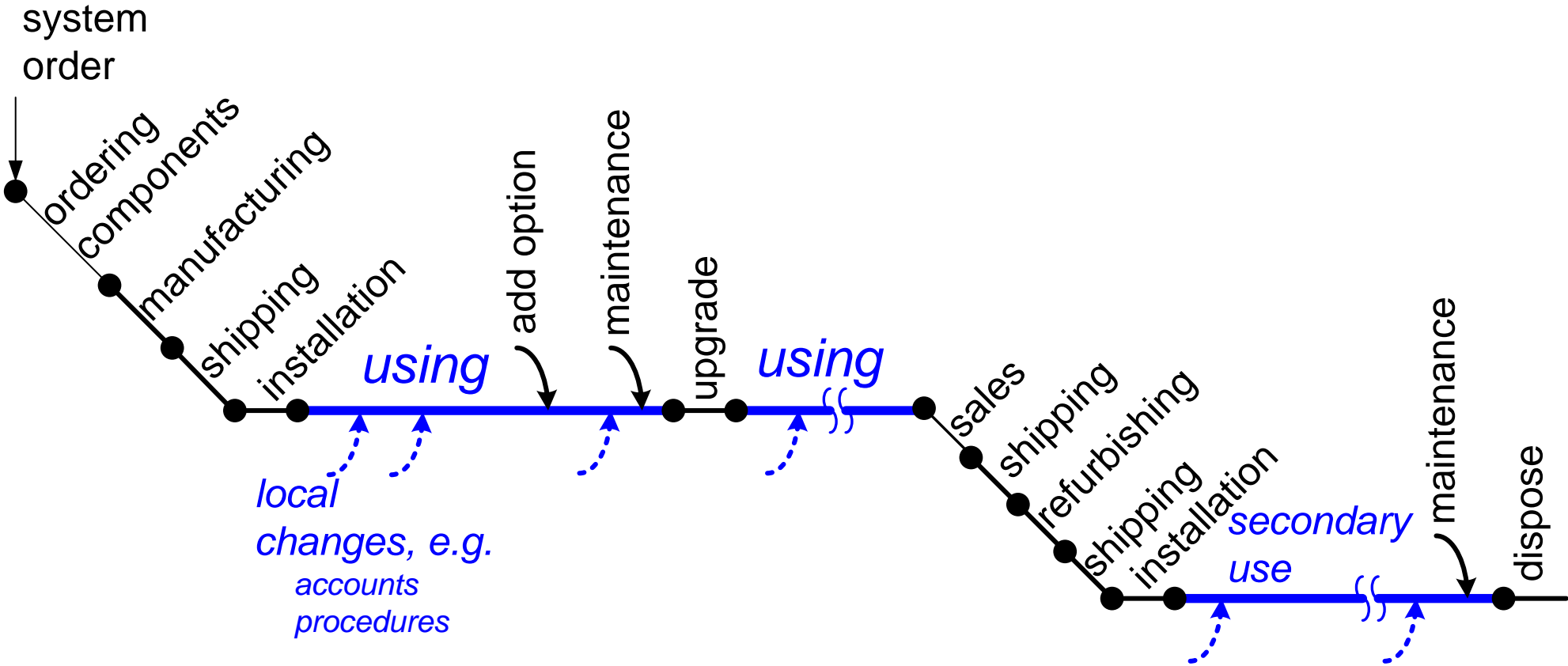
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status: preliminary
draft
version: 0.7



Product Related Life Cycles



System Life Cycle



Approach to Life Cycle Modeling

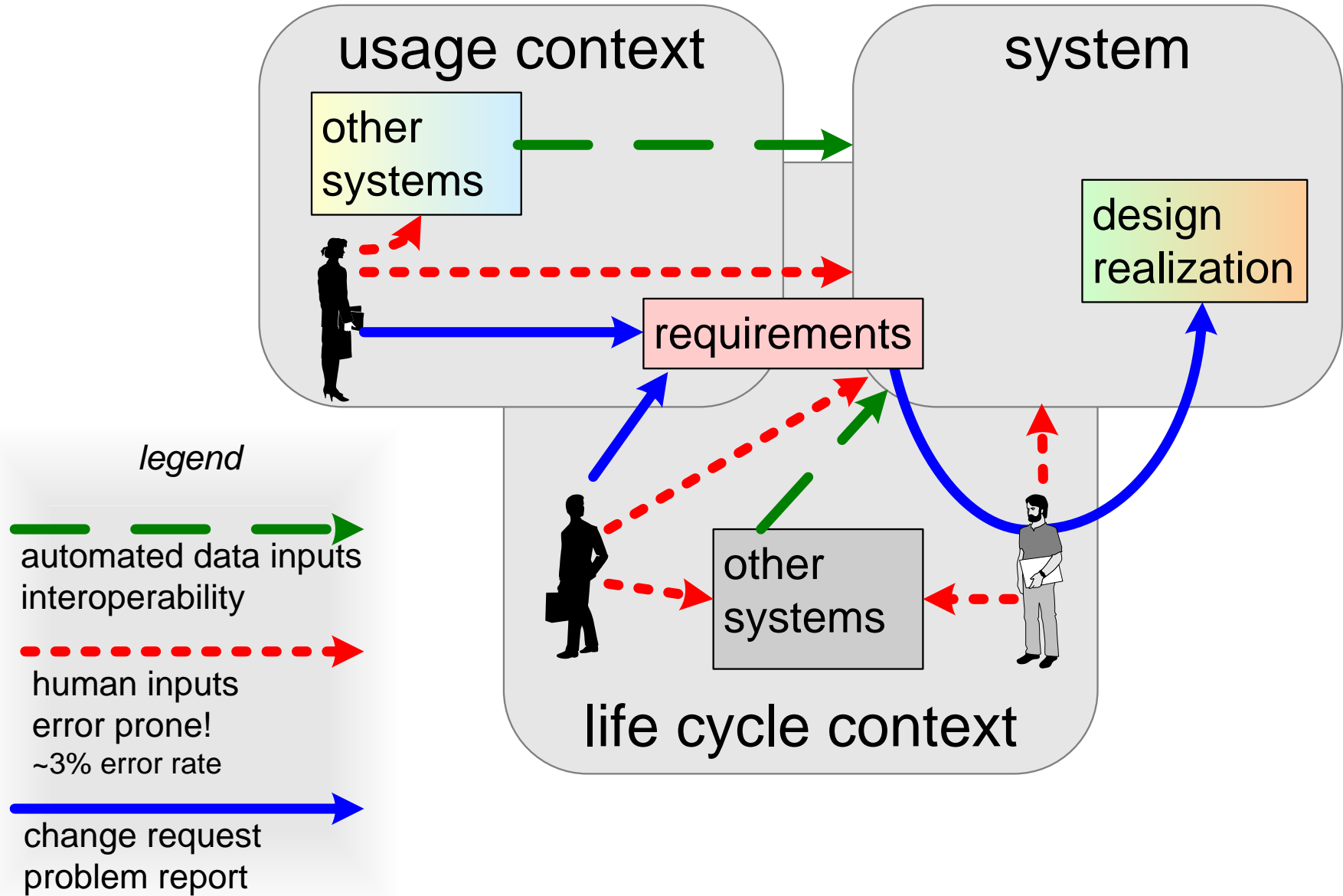
Identify potential life cycle changes and sources		
Characterize time aspect of changes	how often how fast	
Determine required effort	amount type	
Determine impact of change on system and context	performance reliability	} see reasoning
Analyse risks	business	

What May Change During the Life Cycle?

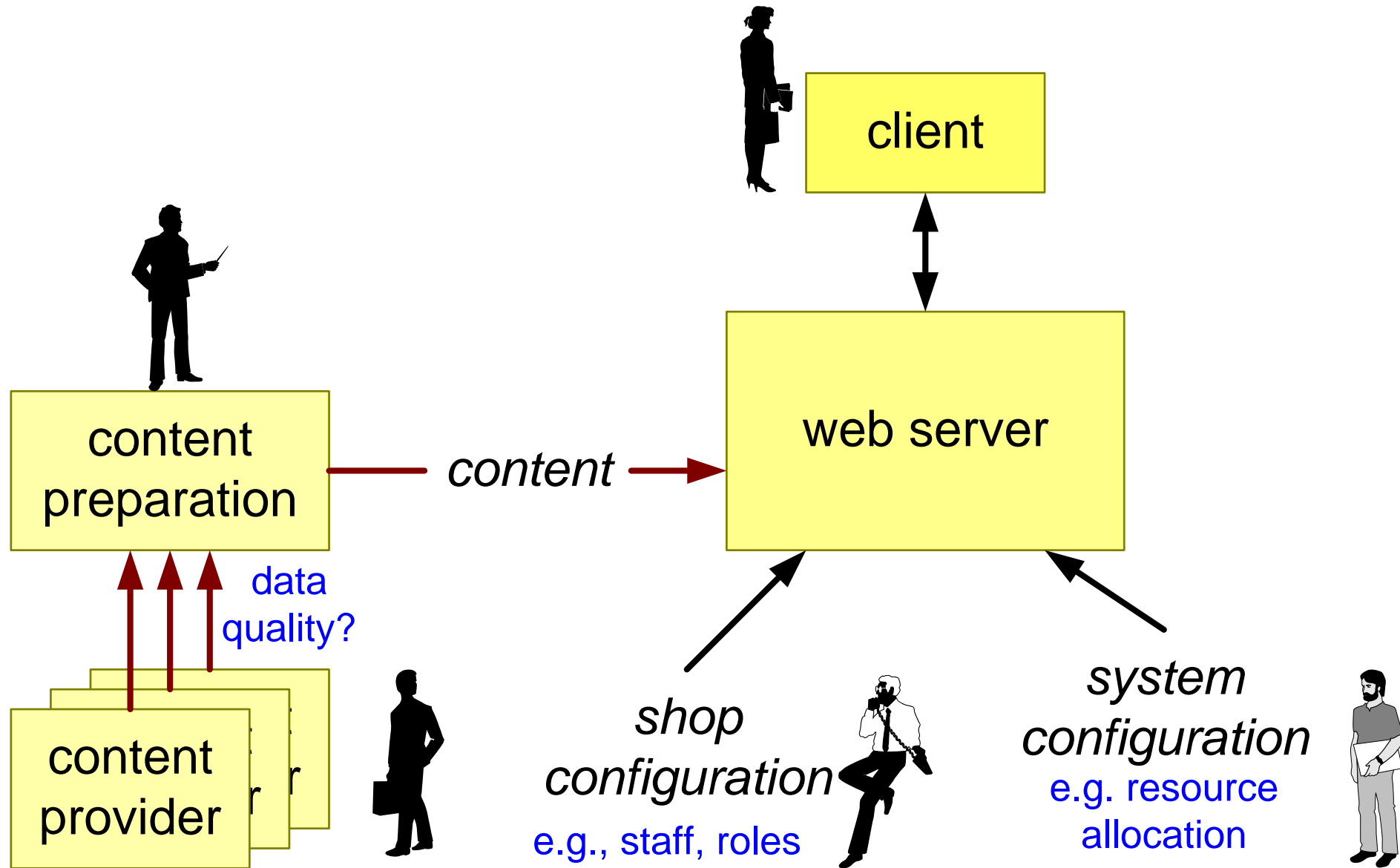
business volume
product mix
product portfolio
product attributes (e.g. price)
customers
personnel
suppliers
application, business processes
et cetera

www.homes4sale.com
www.apple.com/itunes/
www.amazon.com
www.ebay.com
www.shell.com
www.stevens.edu
www.nokia.com
stock market
insurance company
local Dutch cheese shop

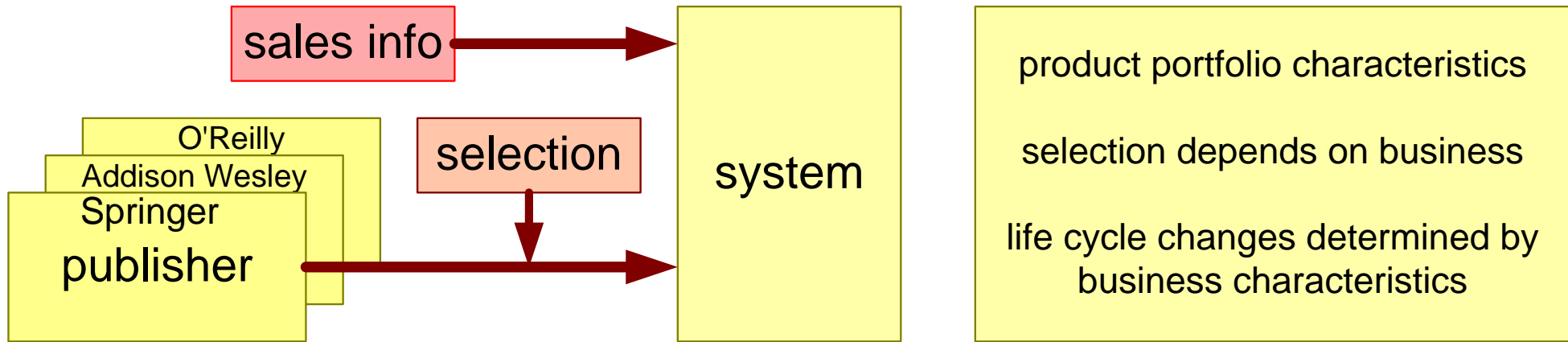
Simple Model of Data Sources of Changes



Data Sources of Web Server



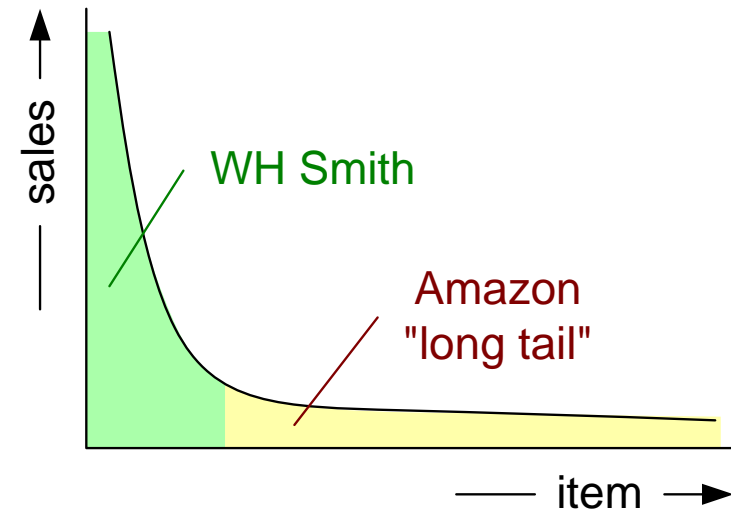
Example Product Portfolio Change Books



new books per year

UK (1)	206k (2005)	107k (1996)
USA(2)	172k (2005)	68k (1996)
China(3)		101k (1994)
India(21)		12k (1996)

source: http://en.wikipedia.org/wiki/Long_tail



source: http://en.wikipedia.org/wiki/Books_published_per_country_per_year

Example Customer Change

internet: broadband penetration

	Q1 '04	Q2 '04	growth in Q2 '04
Asia Pacific total	48M	54M	12.8%
China	15M	19M	26.1%
India	87k	189k	116.8%

http://www.apira.org/download/world_broadband_statistics_q2_2004.pdf

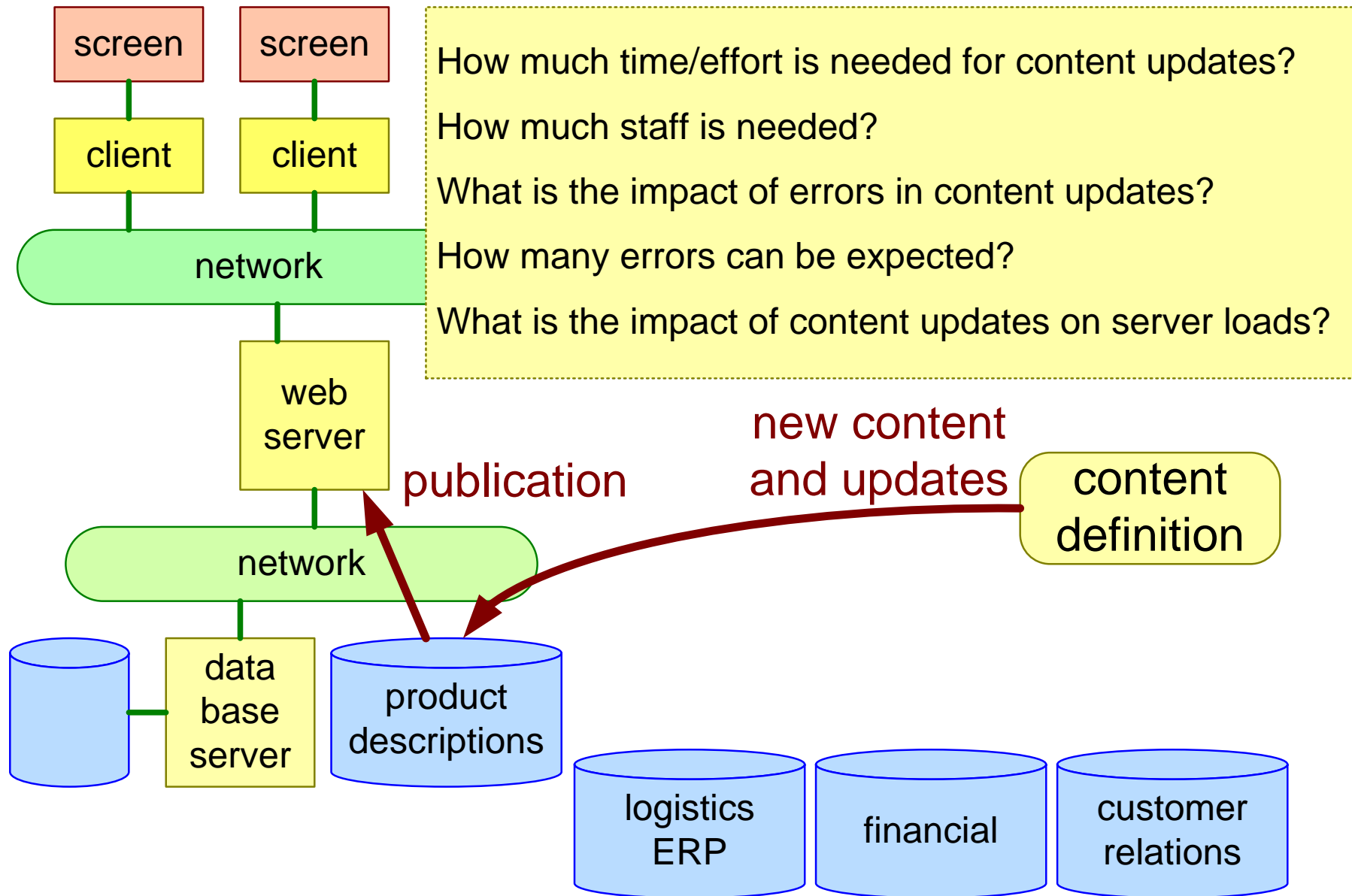
What is the expected growth of # customers?

What is the impact on system and infrastructure?

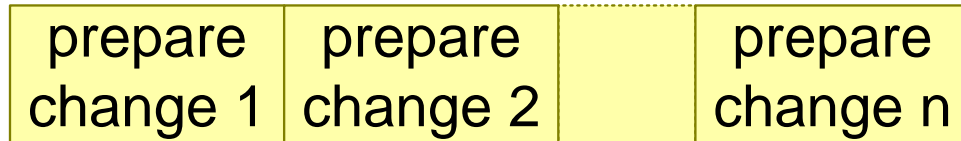
What is the impact on CRM (Customer Relation Management)?

What is the impact on customer, sales support staff?

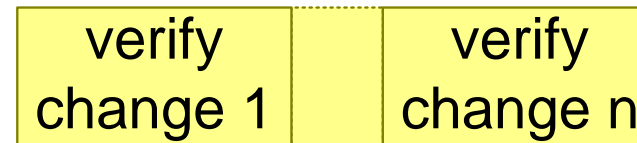
Web Shop Content Update



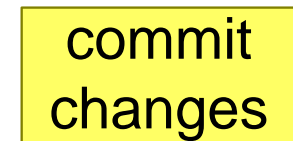
Web Shop Content Change Effort



review input
select info
layout&cosmetics
check-in



inspect source
inspect result



$$\text{effort}_{\text{changes}} = n_{\text{changes}} * (t_{\text{prepare}} + t_{\text{verify}}) + t_{\text{commit}}$$

$$\#fte = \text{effort}_{\text{changes}} / \text{hours per day}$$

with $t_{\text{prepare}} = 4 \text{ min}$

$t_{\text{verify}} = 2 \text{ min}$

$t_{\text{commit}} = 1 \text{ min}$

hours per day = 8 hours

n_{changes} per day	10	100	1000
$\text{effort}_{\text{changes}}$	1 uur	10 uur	100 uur
#fte	0.1	1	12

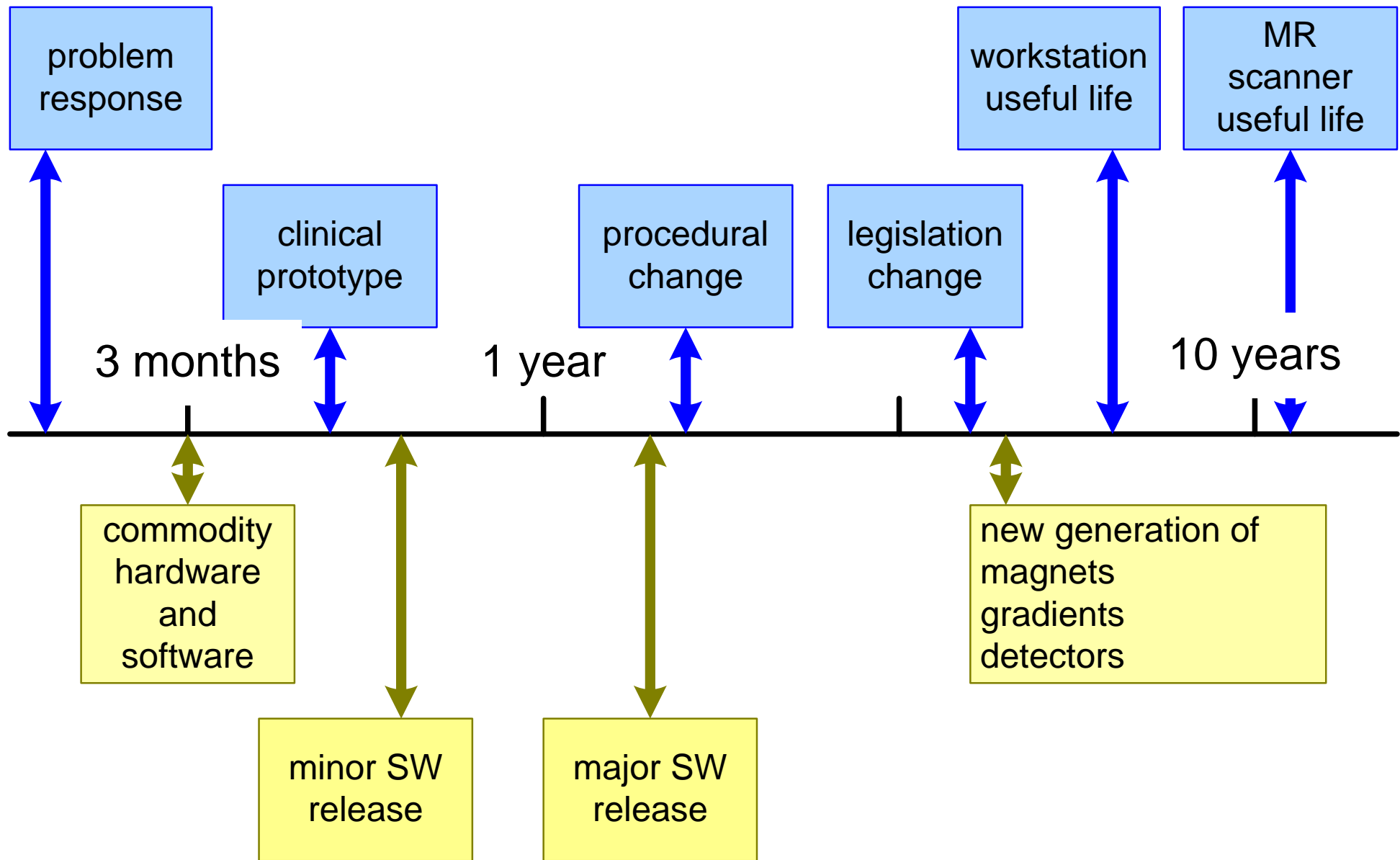
Example of Client Level Changes

The image shows a screenshot of the Amazon.com website in a Mozilla Firefox browser window. The browser's address bar shows the URL 'http://www.amazon.com/'. The page content includes a search bar, a navigation menu on the left, and several product listings. The following callout boxes are overlaid on the image:

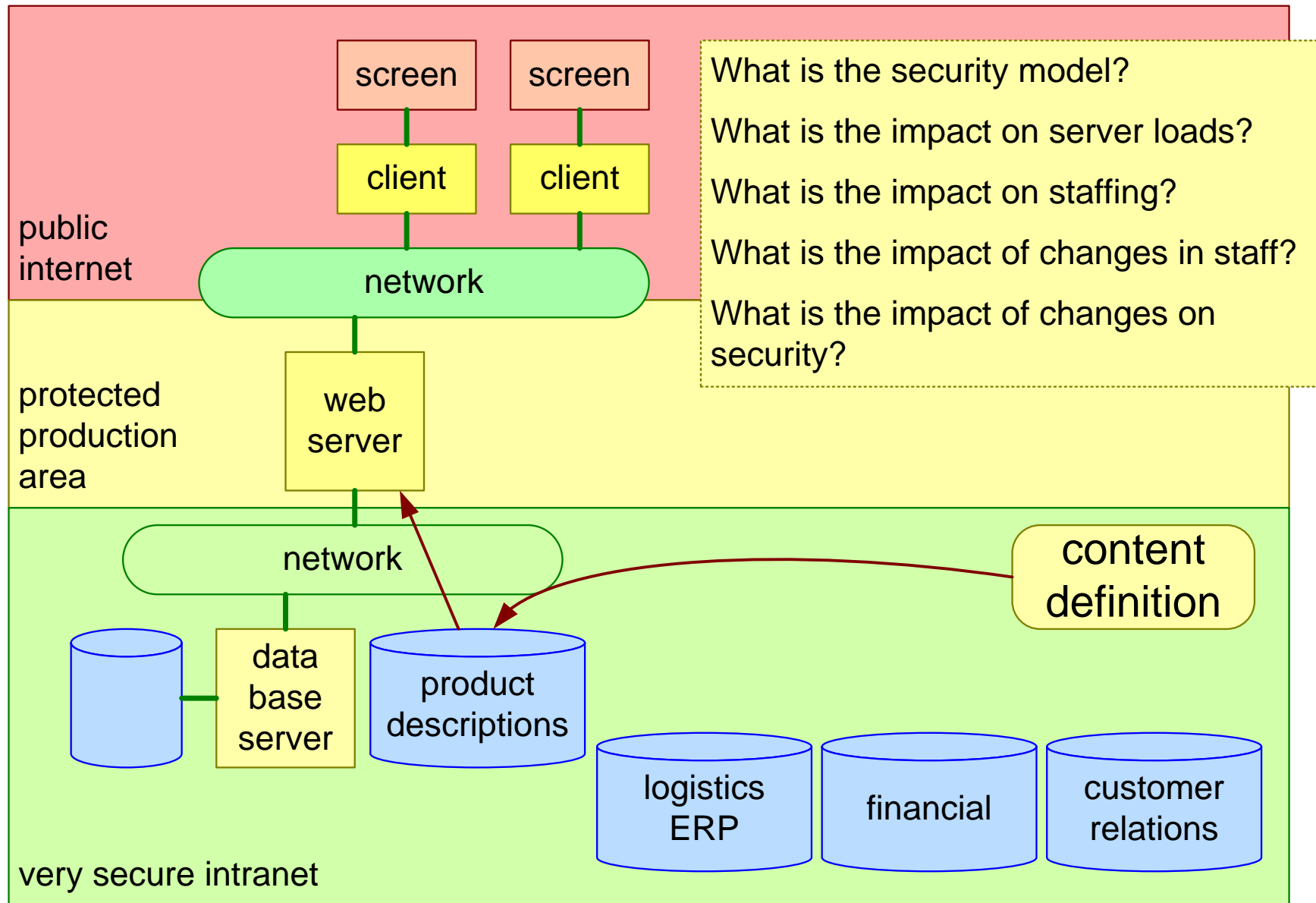
- main access through search**: Points to the search bar at the top of the page.
- personalization**: Points to the 'Hello, Sign in to get personalized recommendations...' text.
- catalogue entries**: Points to the 'Browse' sidebar menu.
- Up-to-date information: Bestsellers**: Points to the 'Books Bestsellers' section.
- What Other Customers Are Looking At Right Now**: Points to the 'What Other Customers Are Looking At Right Now' section.
- other advertisements**: Points to the 'Extreme Savings on...' and 'Free Stand with Bow...' promotional banners.
- styling: frequently updated, fashion!**: Points to the overall layout and promotional banners.
- standard boilerplate**: Points to the footer area containing links like 'Directory of All Stores' and 'Investor Relations'.

snapshot of
www.amazon.com

Example of Time Scale Model for Changes



Web Shop Security and Changes



Web Shop Reliability and Changes

new faults = average fault density * #changes

$$\#errors = \sum_{\text{faults}} f(\text{severity, hit probability, detection probability})$$

	severity	hit probability	detection probability
<i>Jansen iso Janssen</i>	low	high	low
<i>operator iso sales repr</i>	high	high	medium