

Modeling and Analysis: Life Cycle Models

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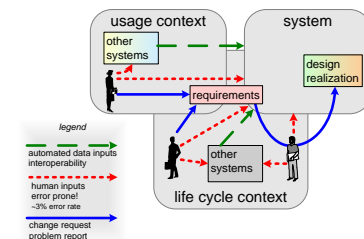
Abstract

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.

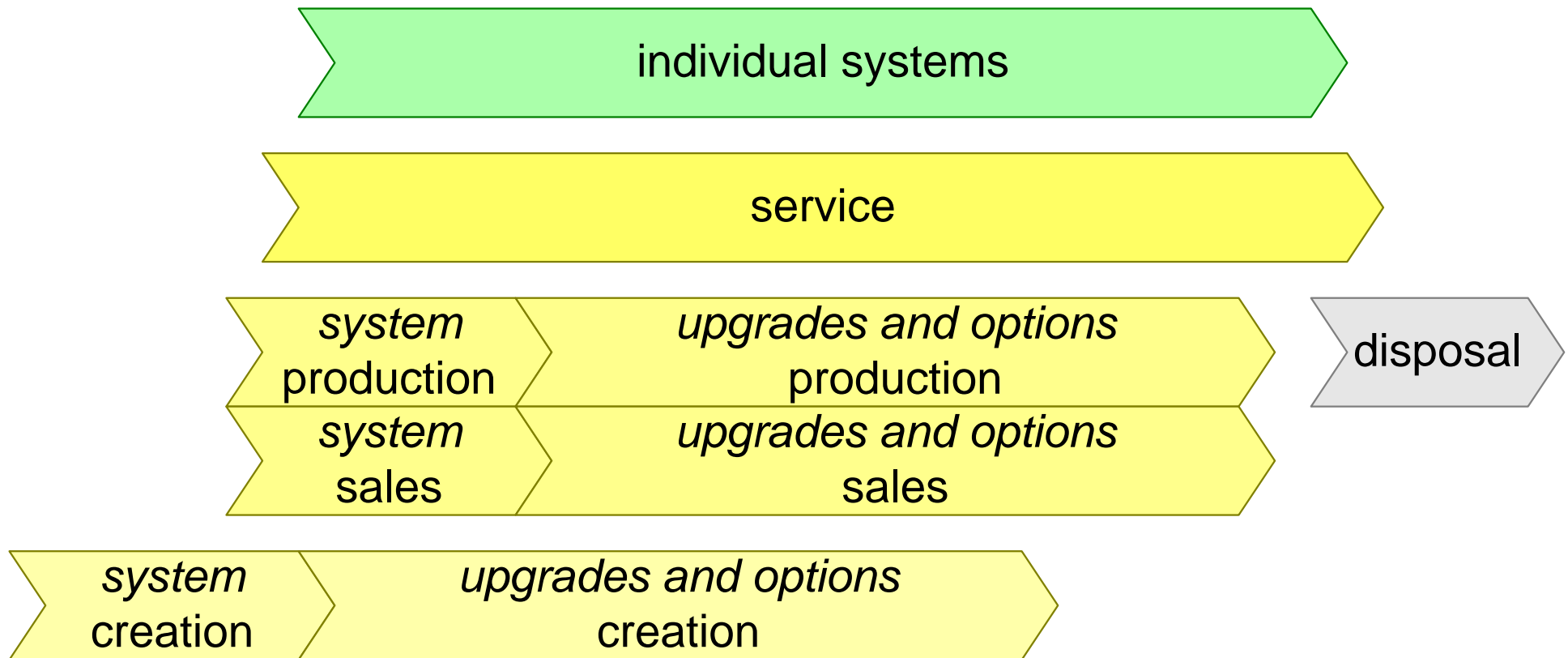
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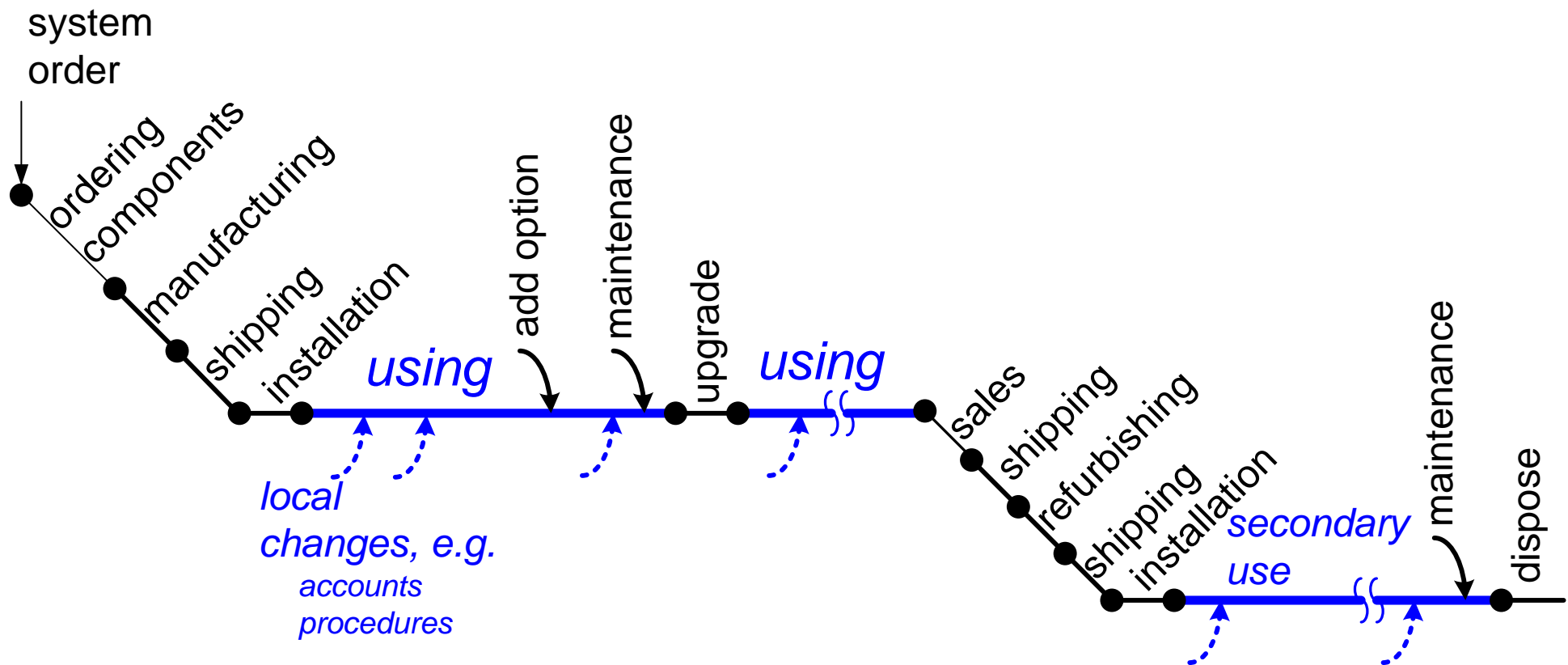
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draft
version: 0.7



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
Analyse risks	business

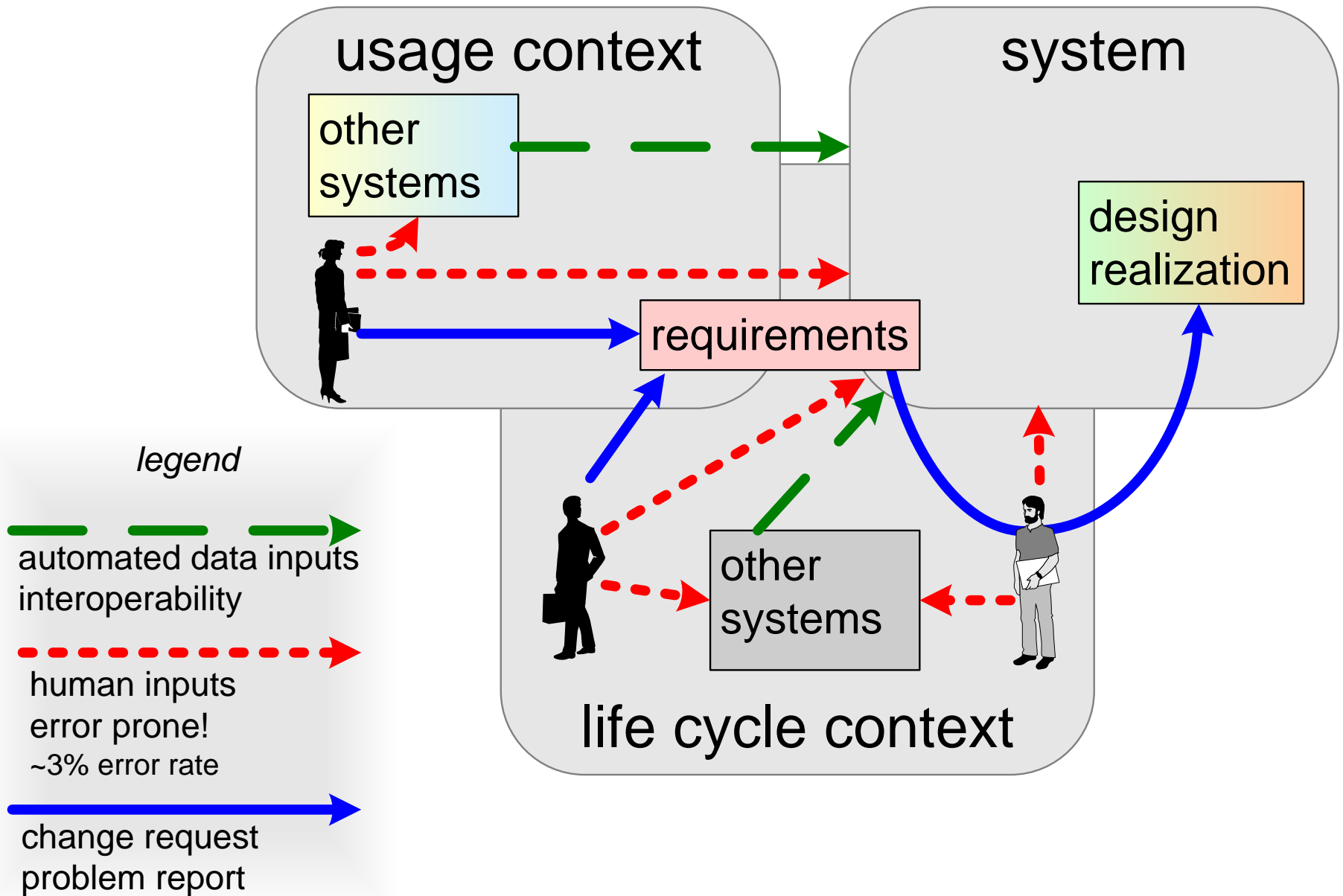
see reasoning

What May Change During the Life Cycle?

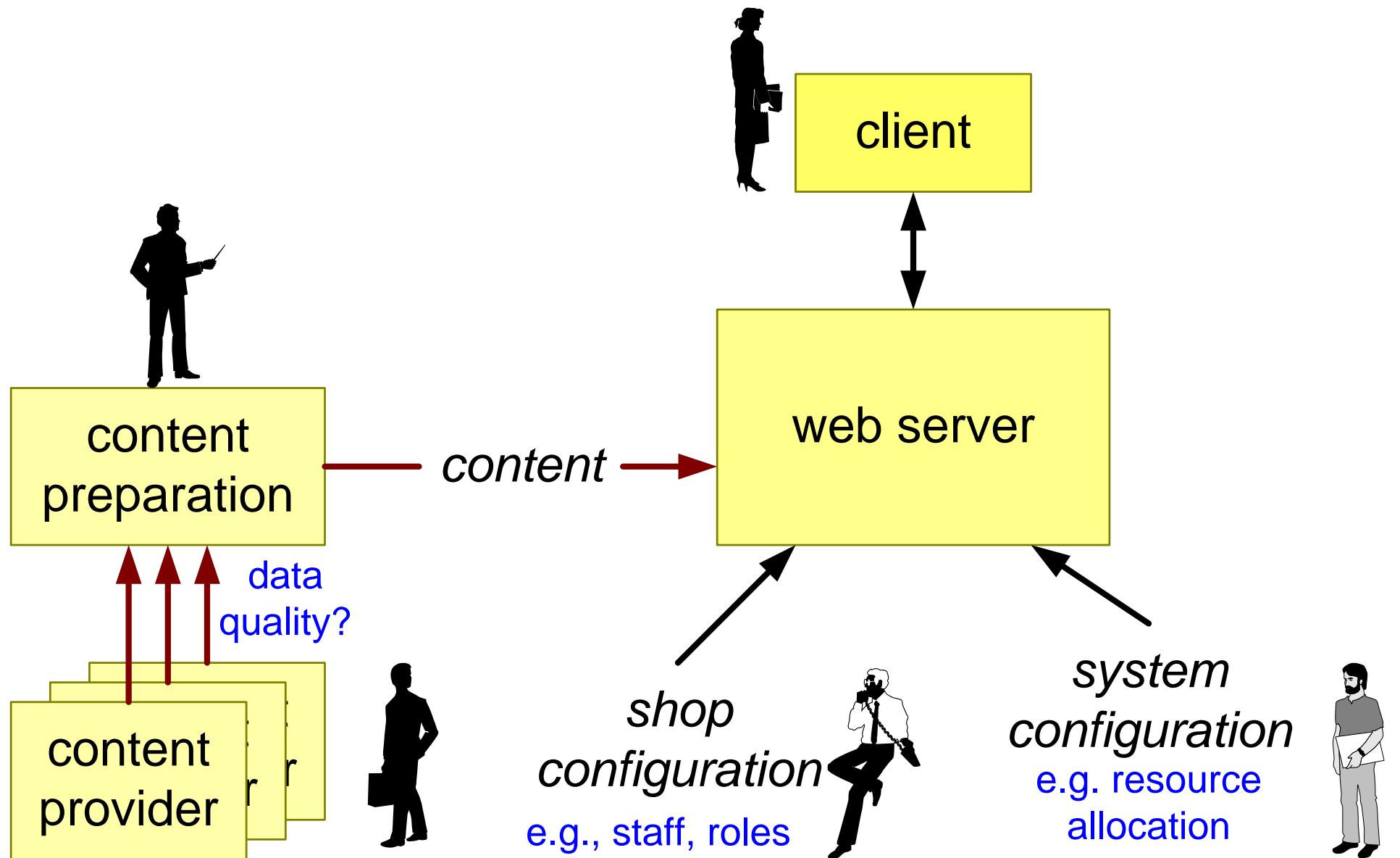
business volume
product mix
product portfolio
product attributes (e.g. price)
customers
personnel
suppliers
application, business processes
et cetera

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

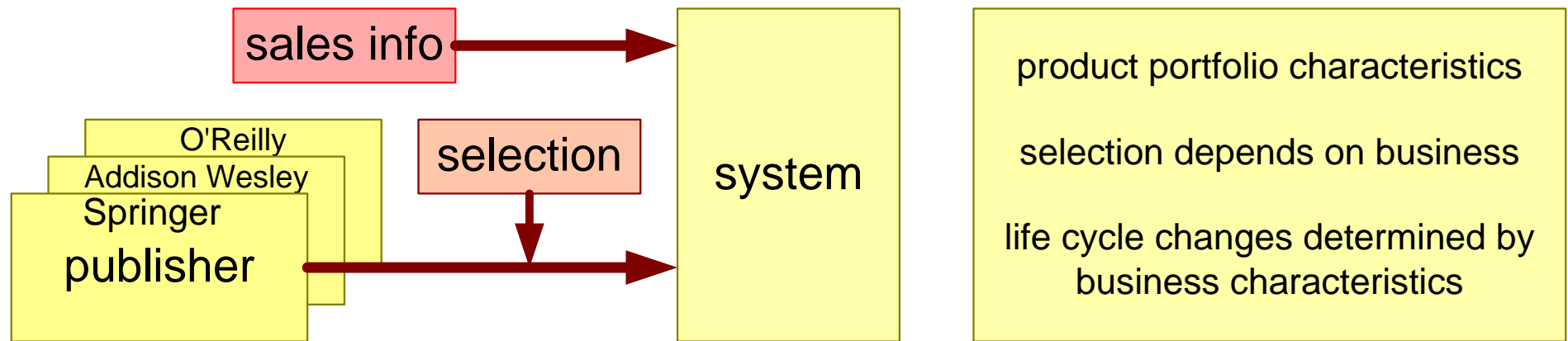
Simple Model of Data Sources of Changes



Data Sources of Web Server



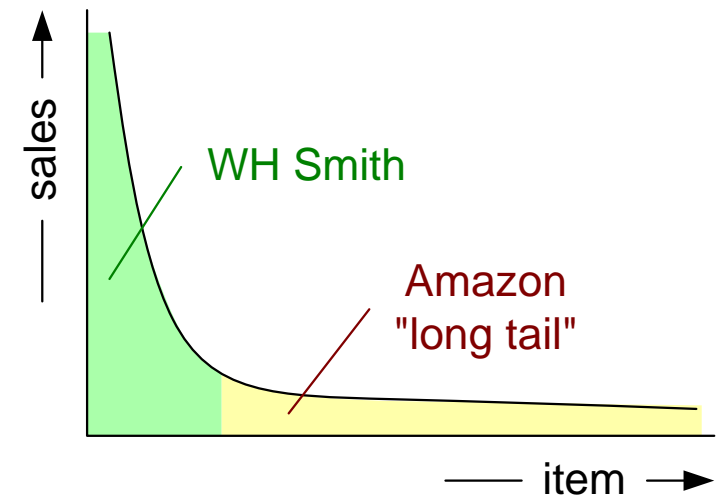
Example Product Portfolio Change Books



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

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/Books_published_per_country_per_year

Example Customer Change

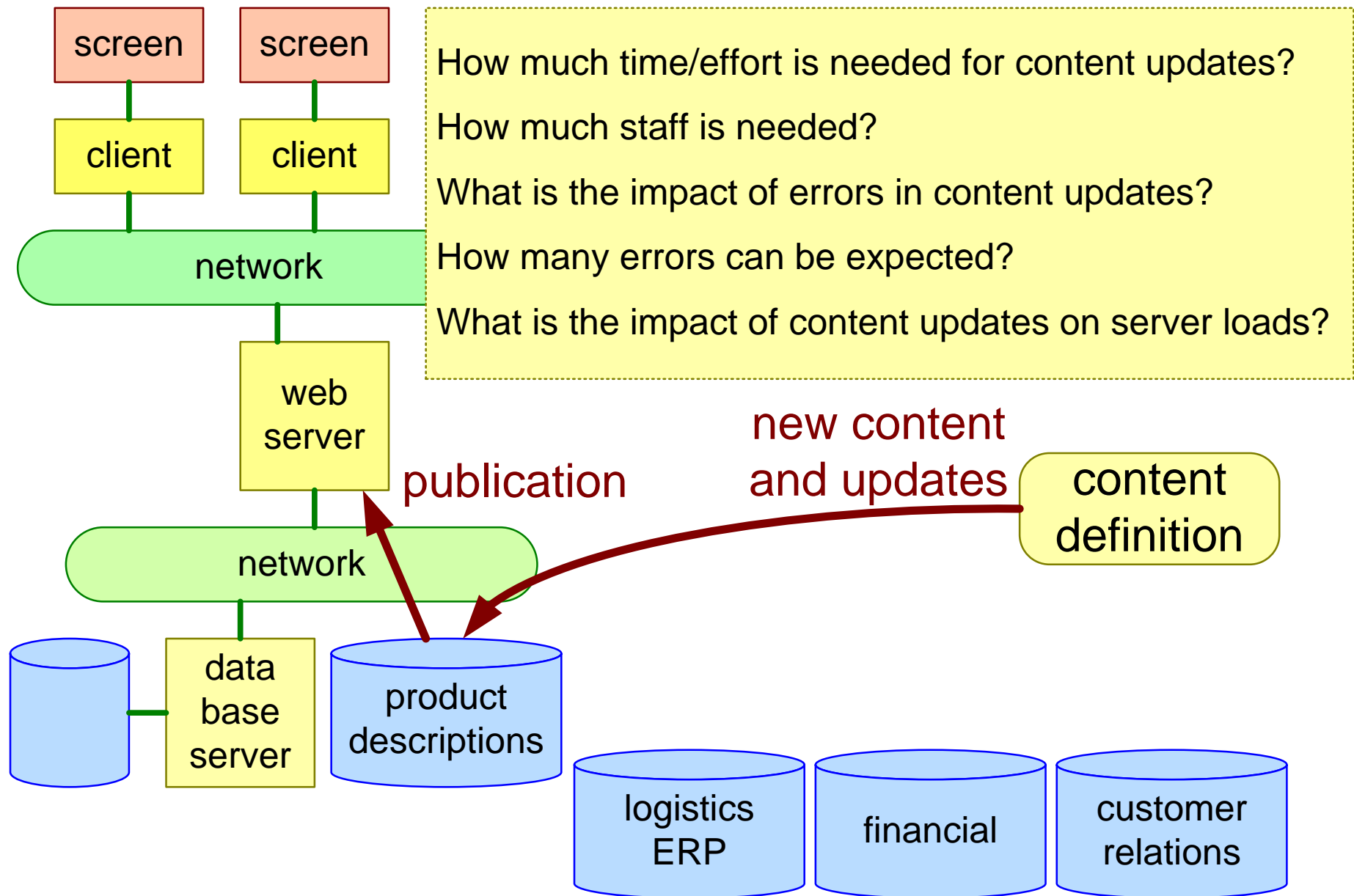
internet: broadband penetration

	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%

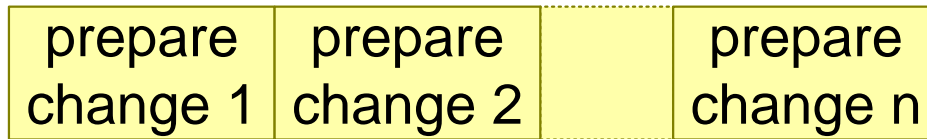
http://www.apira.org/download/world_broadband_statistics_q2_2004.pdf

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?

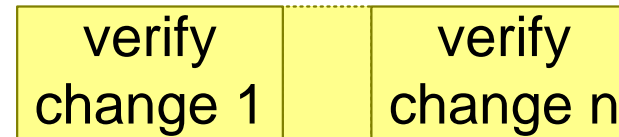
Web Shop Content Update



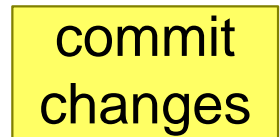
Web Shop Content Change Effort



review input
select info
layout&cosmetics
check-in



inspect source
inspect result



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

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

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

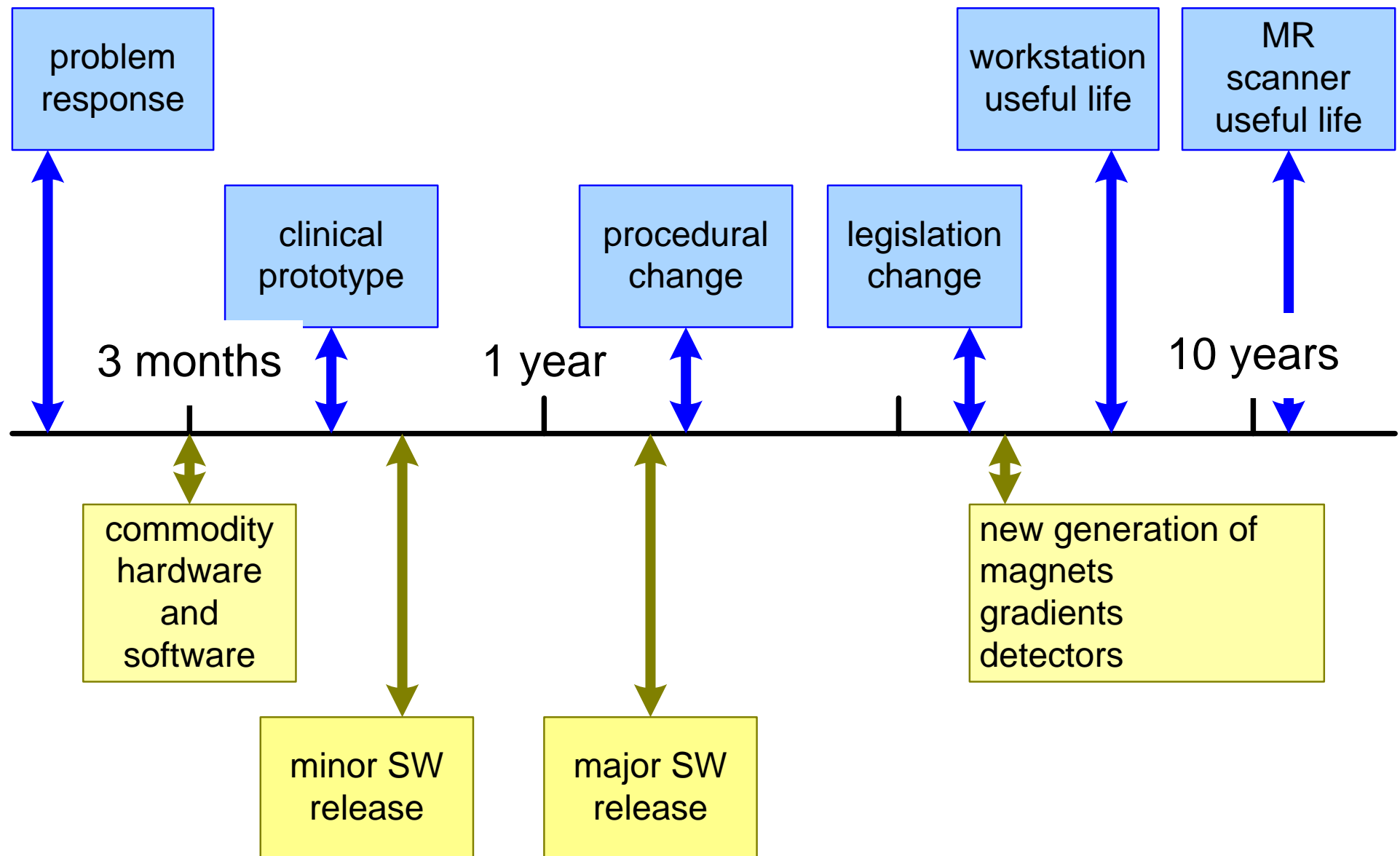
Example of Client Level Changes

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

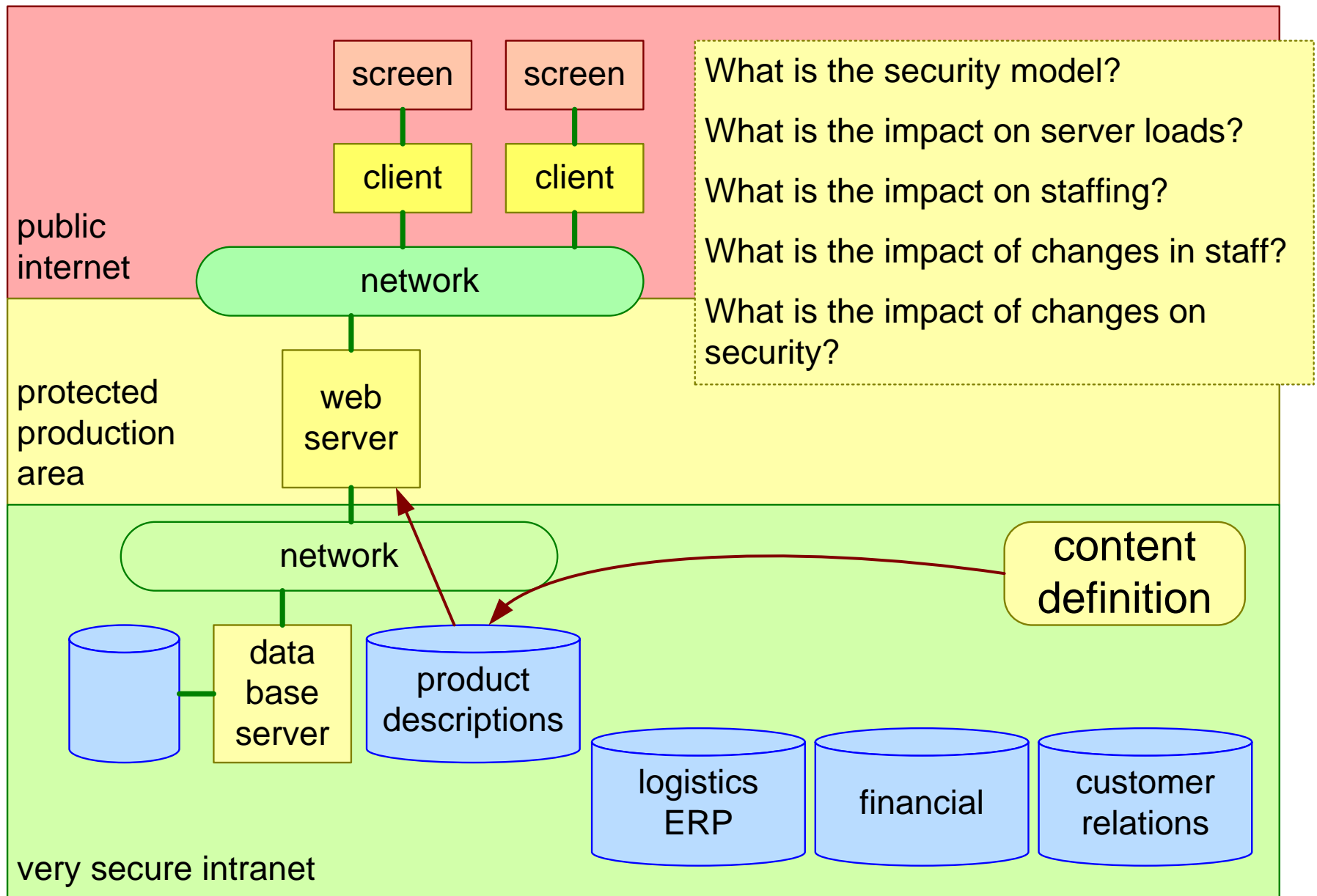
- main access through search**: Points to the search bar at the top of the page.
- personalization**: Points to the text 'Hello. Sign in to get personalized recommendations. New customer? Start here.'
- catalogue entries**: A vertical box on the left side of the page, encompassing the navigation menu.
- styling: frequently updated, fashion!**: A box on the right side of the page, pointing to the promotional banners and advertisements.
- other advertisements**: A vertical box on the right side of the page, encompassing the promotional banners.
- Up-to-date information: Bestsellers What Other Customers Are Looking At Right Now**: A large box in the center of the page, pointing to the 'Books Bestsellers' and 'What Other Customers Are Looking At Right Now' sections.
- standard boilerplate**: A box at the bottom of the page, pointing to the footer area containing links like 'Directory of All Stores', 'Canada', 'United Kingdom', etc.

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