

Modeling and Analysis: Life Cycle Models

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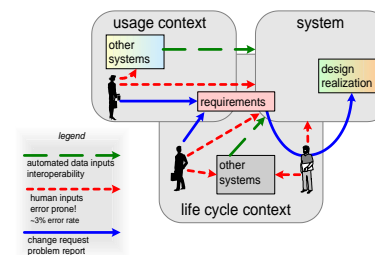
Abstract

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.

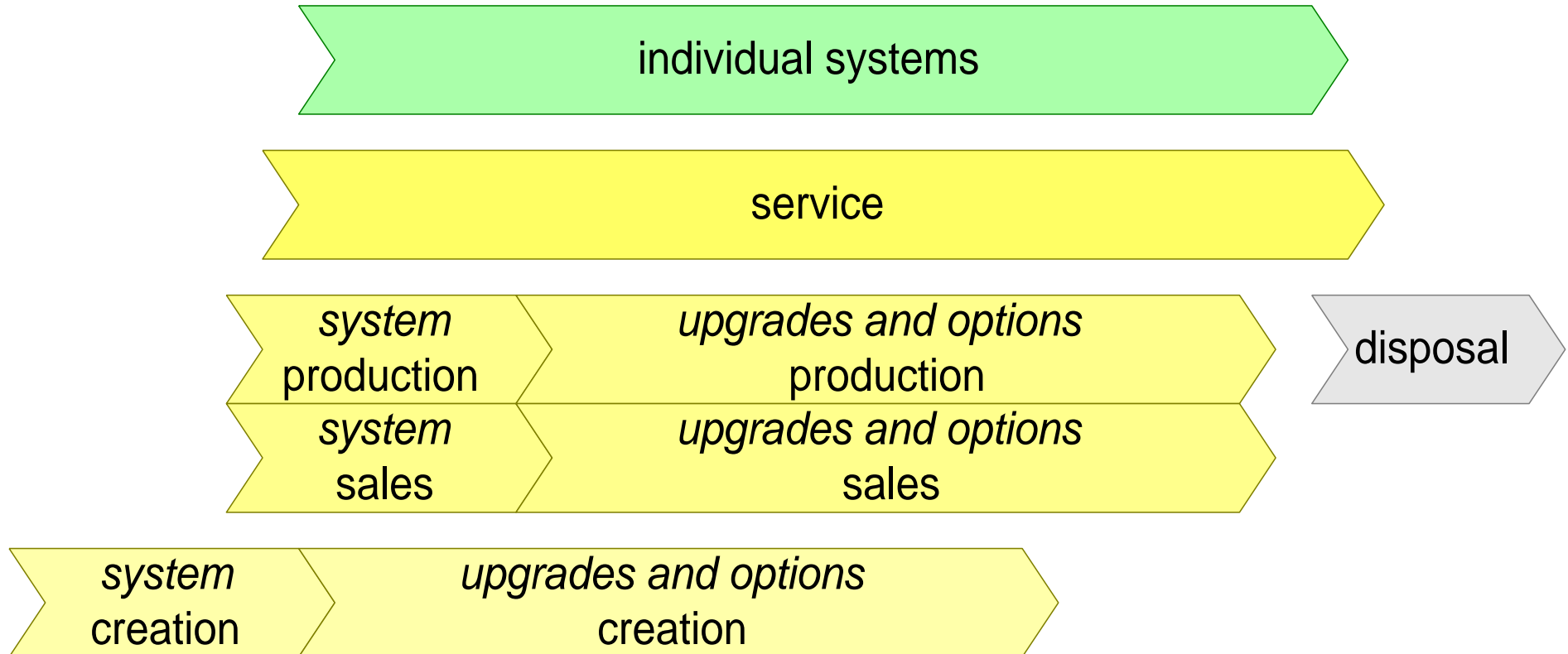
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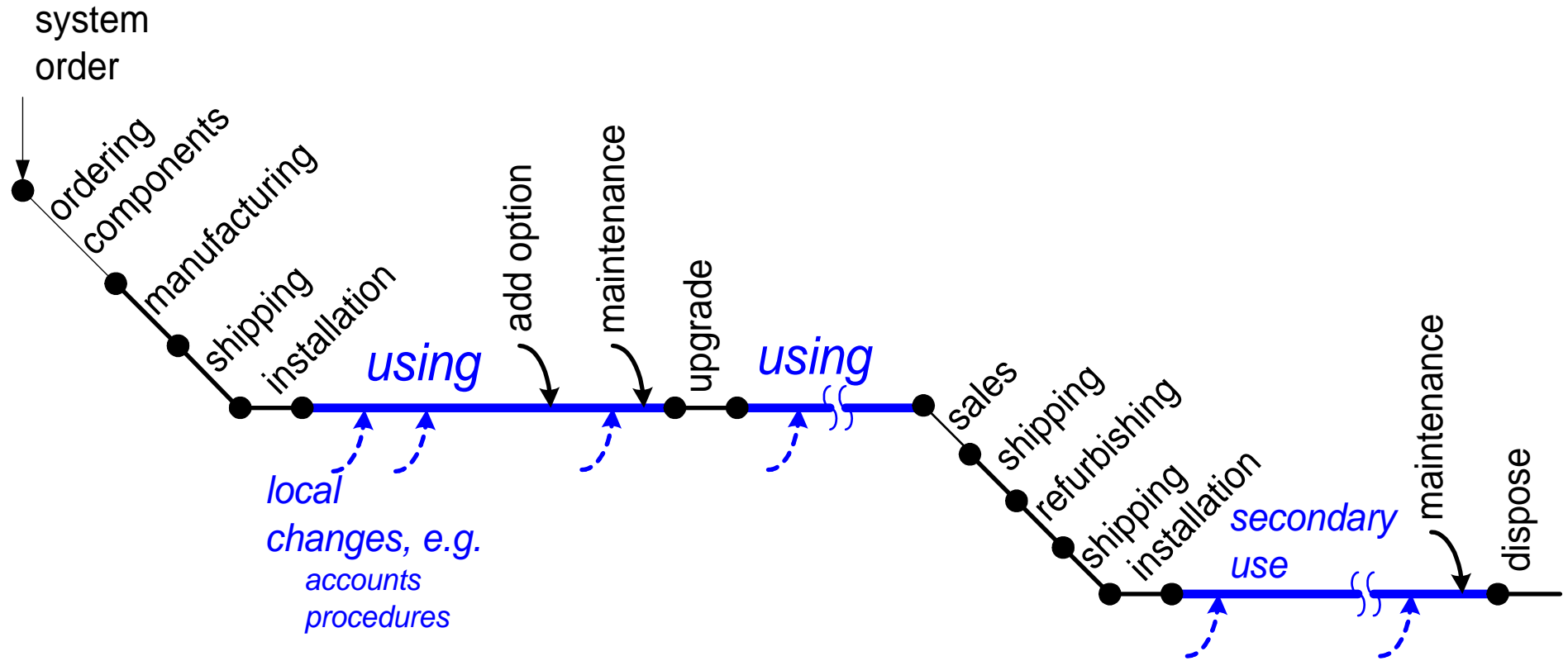
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status: preliminary
draft
version: 0.7



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

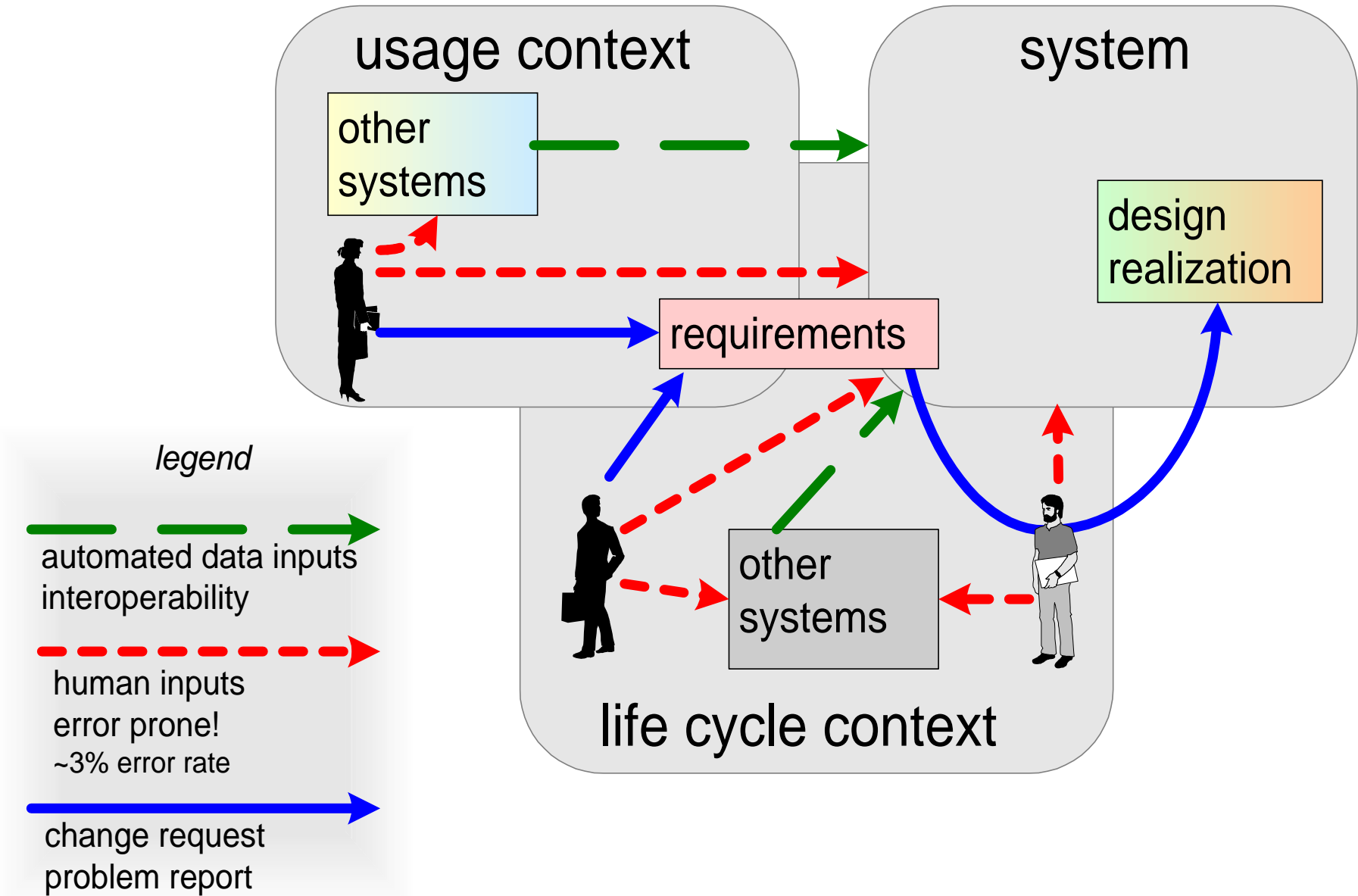
www.nokia.com

stock market

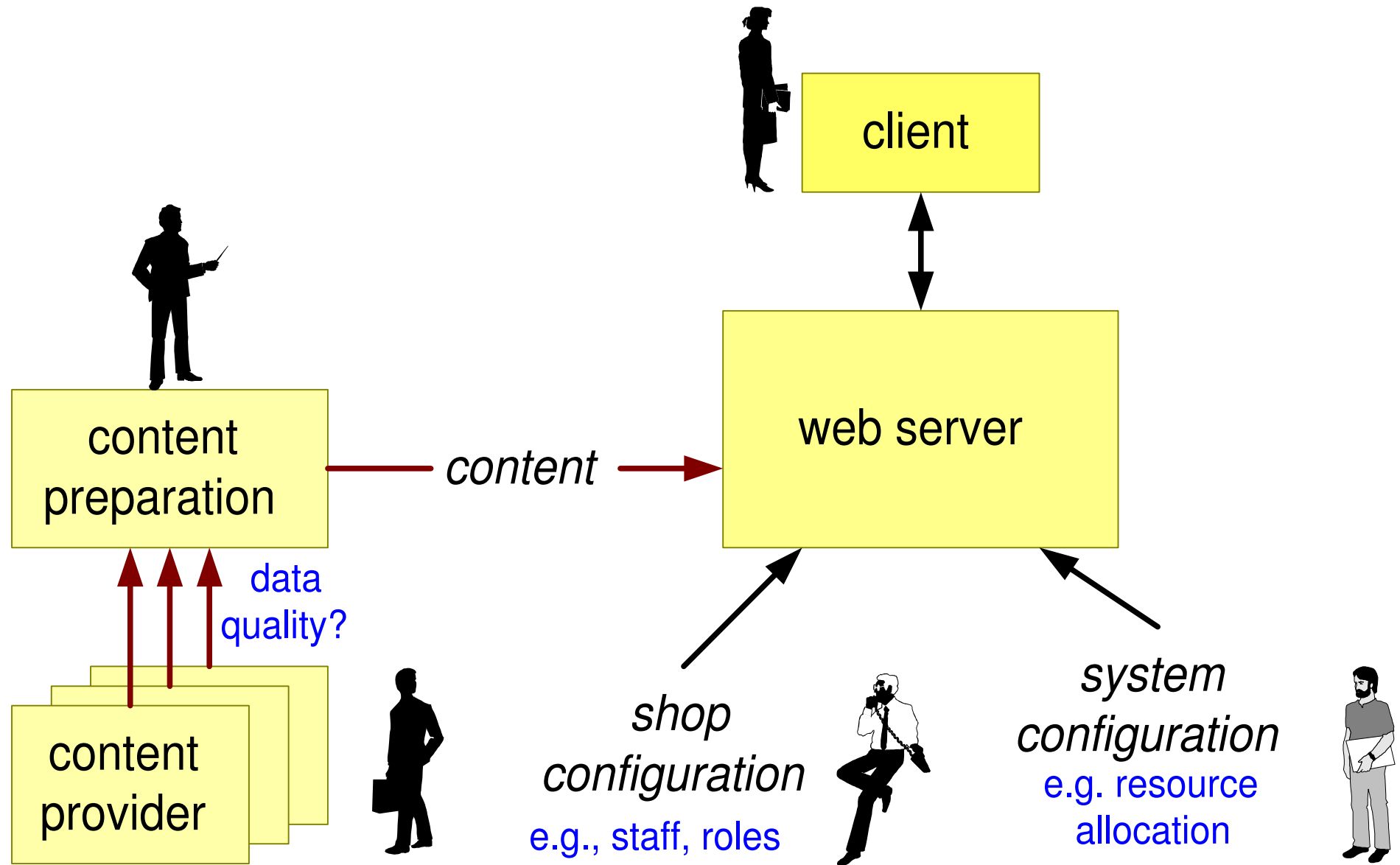
insurance company

local Dutch cheese shop

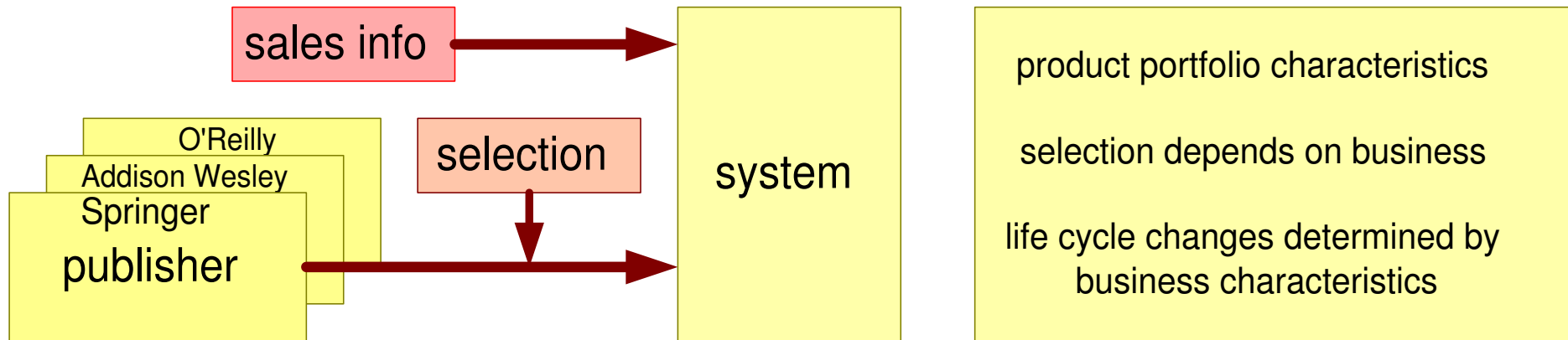
Simple Model of Data Sources of Changes



Data Sources of Web Server



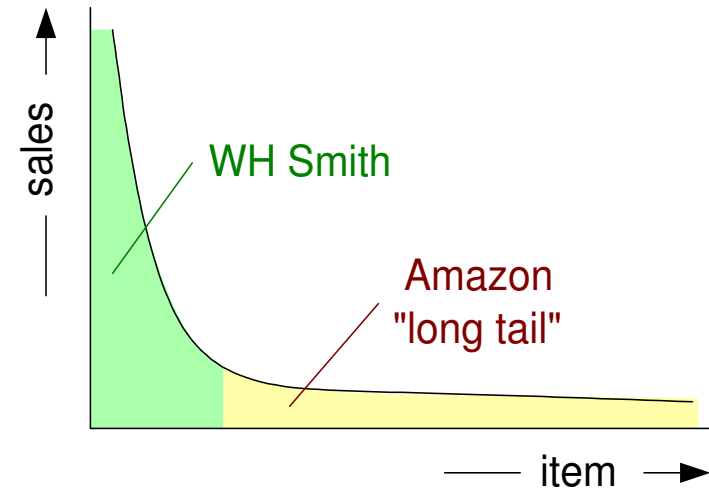
Example Product Portfolio Change Books



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

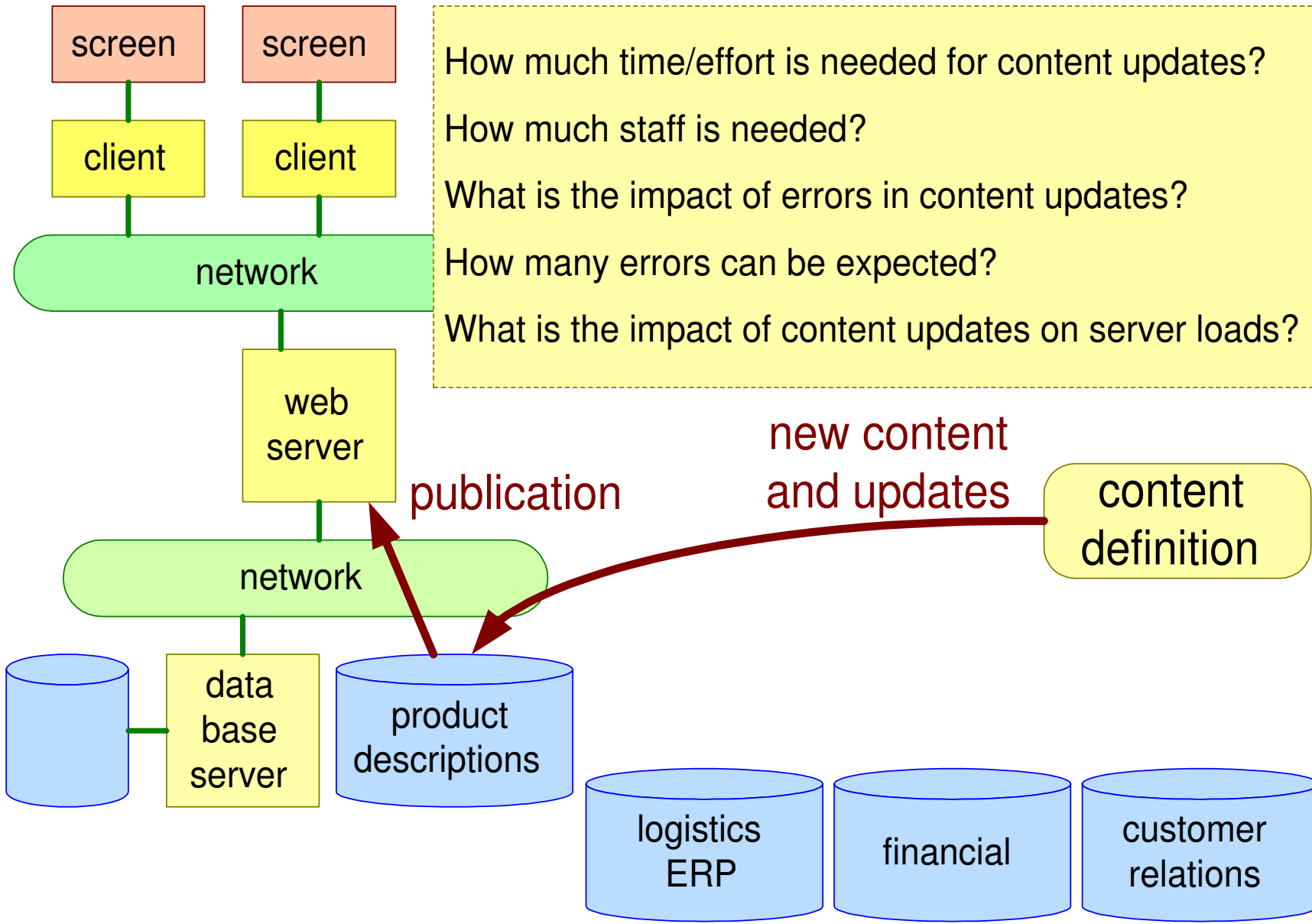
What is the expected growth of # customers?

What is the impact on system and infrastructure?

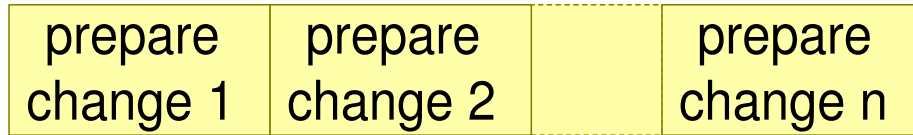
What is the impact on CRM (Customer Relation Management) ?

What is the impact on customer, sales support staff?

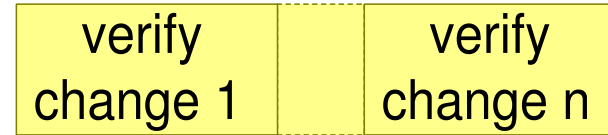
Web Shop Content Update



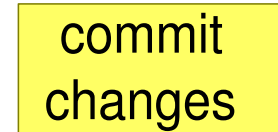
Web Shop Content Change Effort



review input
select info
layout&cosmetics
check-in



inspect source
inspect result



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

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

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

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

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

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

hours per day = 8 hours

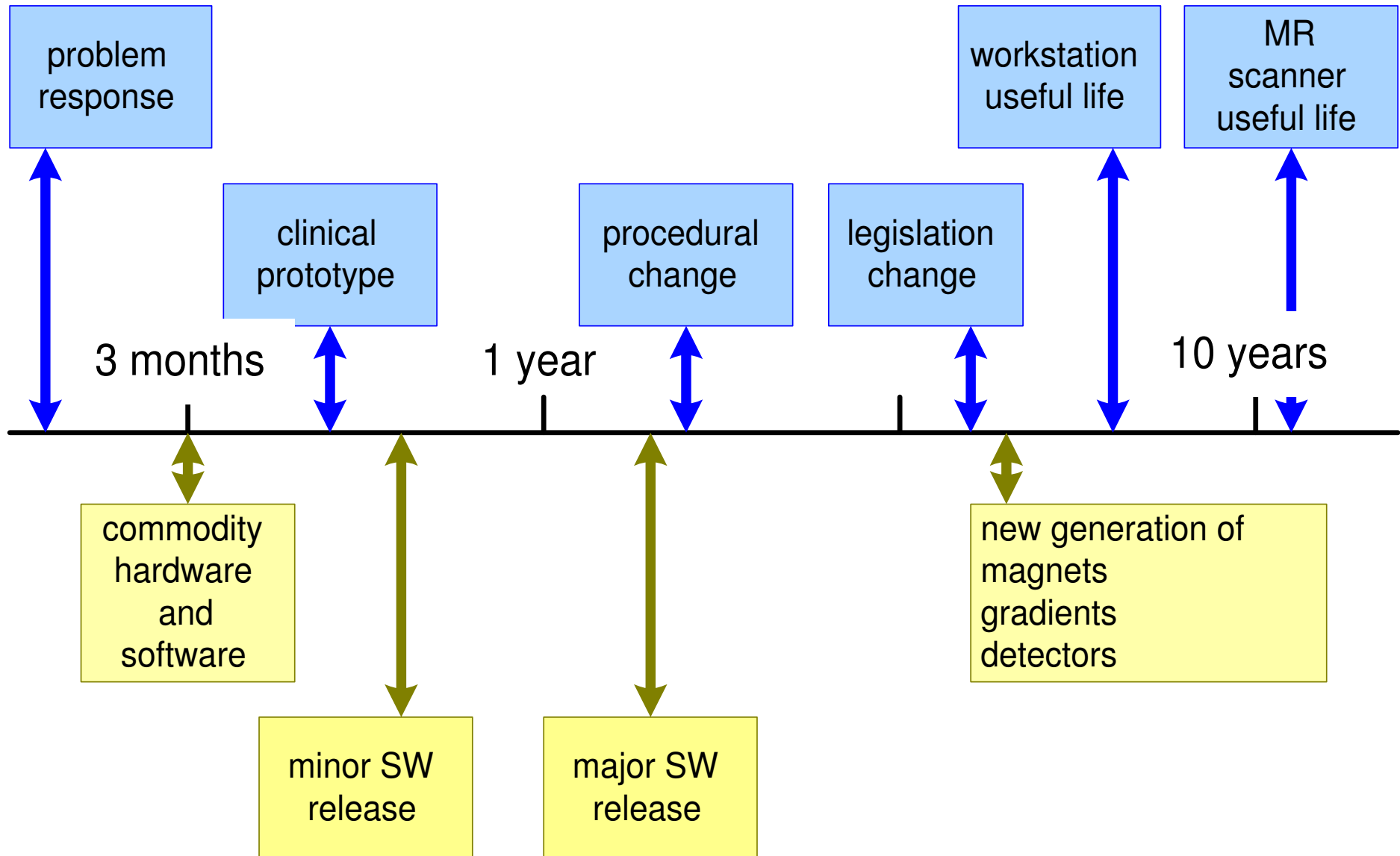
Example of Client Level Changes

The image shows a screenshot of the Amazon.com website in a Mozilla Firefox browser window. The page displays a search bar at the top, a navigation menu on the left, and a main content area with product recommendations. Several yellow callout boxes are overlaid on the image, pointing to specific features:

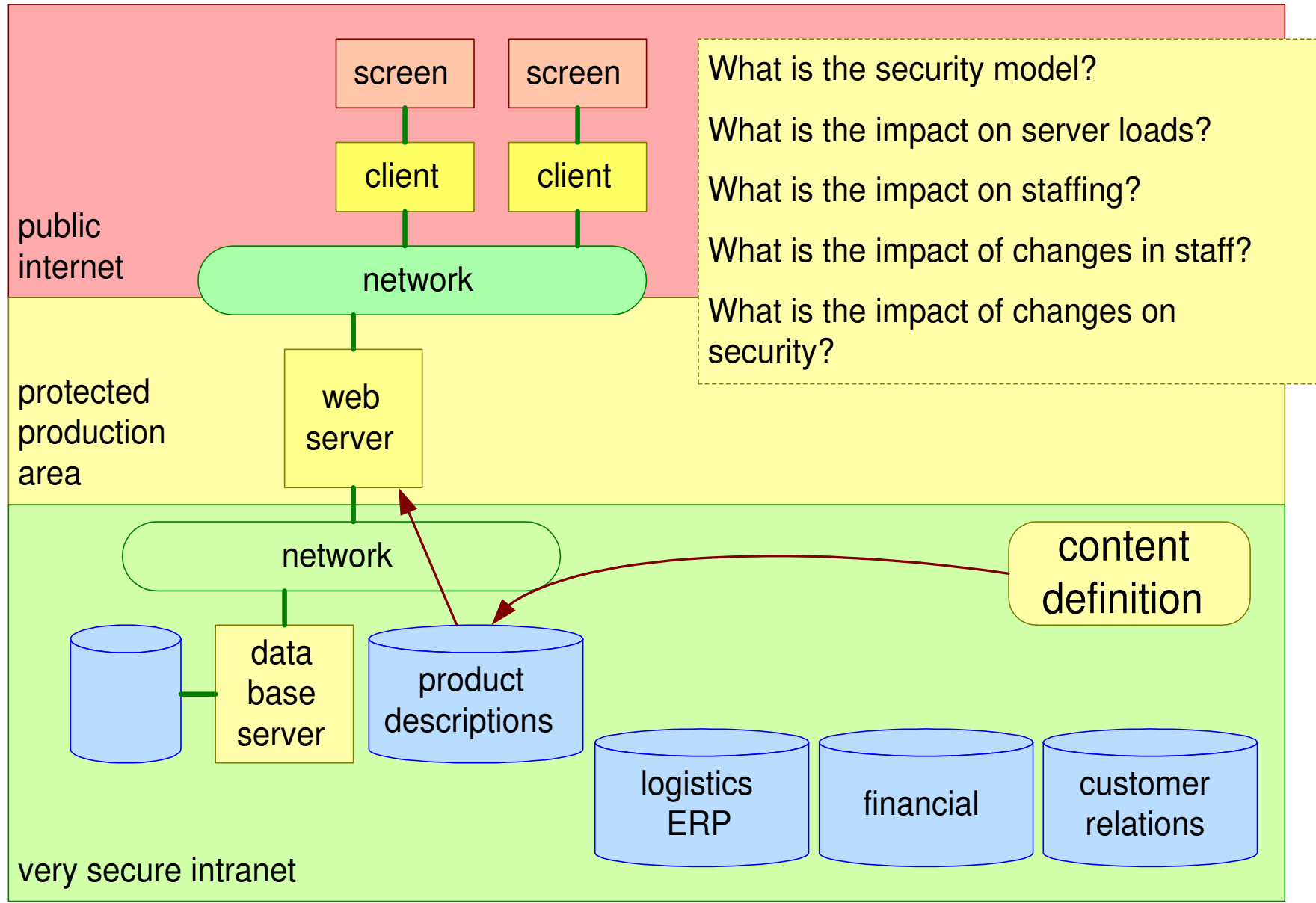
- main access through search**: Points to the search bar at the top of the page.
- personalization**: Points to the text "Hello. Sign in to get personalized recommendations. New customer? Start here." below the search bar.
- catalogue entries**: A vertical box on the left side of the page, pointing to the navigation menu.
- other advertisements**: A vertical box on the right side of the page, pointing to various promotional banners and ads.
- styling: frequently updated, fashion!**: A box on the right side, pointing to the overall layout and design of the page.
- Up-to-date information: Bestsellers What Other Customers Are Looking At Right Now**: A 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", "Investor Relations", and "Press Release".

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