Applying “Manufacturing Innovation” to Software Development

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Fujitsu Limited

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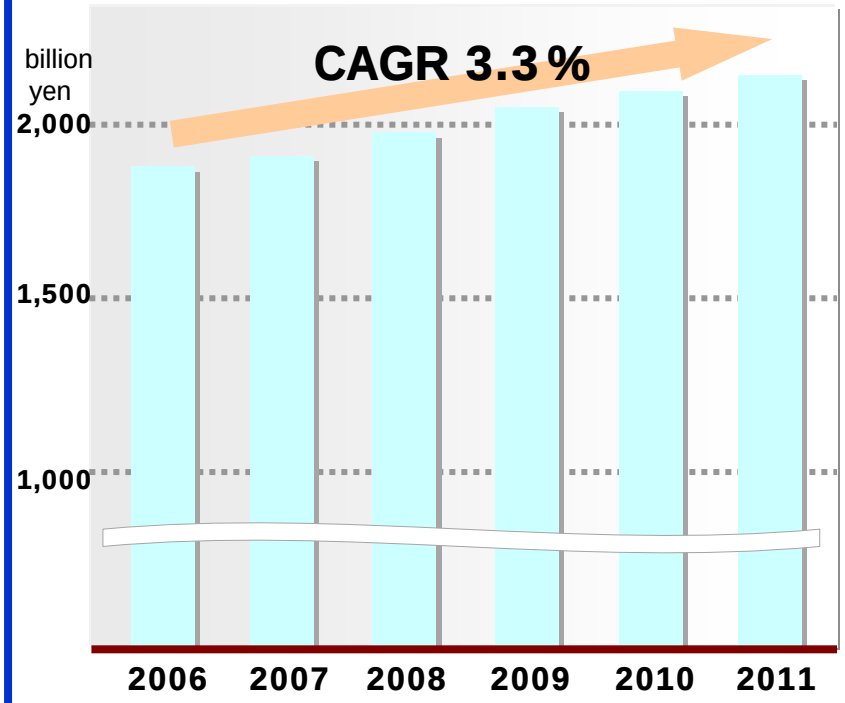
1. Current Status of Fujitsu's SI Business and IT System Challenges

SI Market Size and Fujitsu's Position

- **Fujitsu Group ranks #1 in SI sales in Japan**
- **Average Japanese market growth through 2011 forecasted at 3.3%**

Size of SI Market in Japan*



Source: IDC Japan 9/2007 "Japan IT Services Market 2006 Industry-based Analysis and 2007 – 2011 Projections: 2007 First-half Update" (Doc#J72440107)

Ranking of SI Vendors in Japan by Sales

	Vendor
1	FUJITSU
2	Hitachi
3	NEC
4	NTT Data
5	IBM

Source: IDC Japan 9/2007 "2007 Japan Services Market Vendor Competition Analysis: March 2007" (Doc#J7240106)

* "Project-base" data as defined by IDC

Fujitsu SI Business: On Recovery Path

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- **Reduced losses through risk management**

  FY ’04: 40 bn yen loss ⇒ FY ’06: under 10 bn yen loss

- **Improving margins through better project management**

Solutions/SI operating profit margins (Rough est., excludes FC*)	FY ‘04	FY ‘05	FY ‘06
	2％	4％	5％

- **Promoting split contracts (under 100 man-months)**

Sales Ratio	FY ‘04	FY ‘05	FY ‘06
	43％	44％	47％

- **Achieve business recovery through improved management**
- **Further promote QCD** improvement in mfg. innovation**

*FC: Fujitsu Consulting **QCD: Quality, Cost, Delivery

IT System Challenge: Customers Not Satisfied with Results of IT Investment

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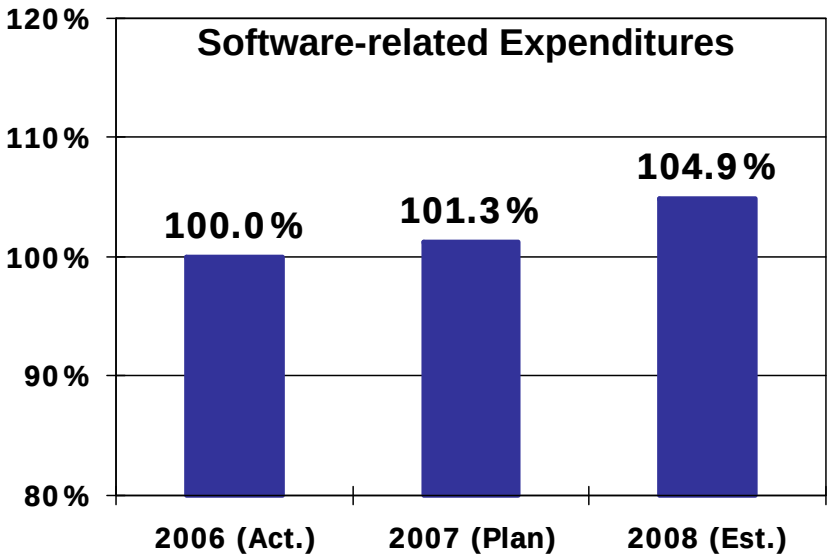
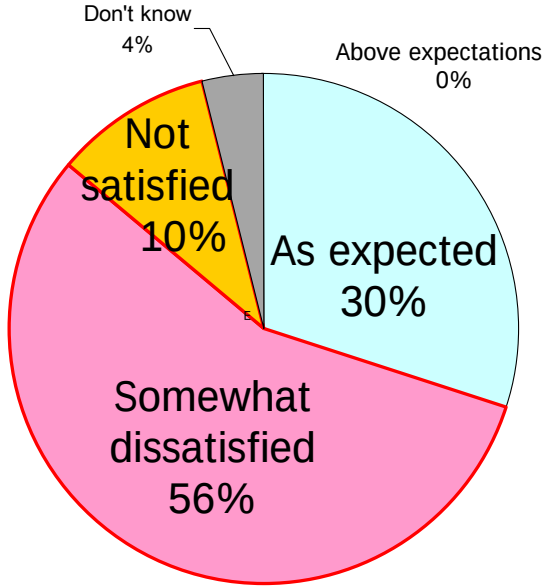
Growth in Fujitsu users' software expenditures expected to taper off



Source: 29th IT Survey, LS Research* IT White Paper, 2007 edition

70% of user co. CIOs not satisfied with IT investment



Source: Nikkei Computer, Oct. 30, 2006; Data: Abeam Consulting, "Awareness Survey of CIOs of Japanese Listed Companies," 141 valid responses, Feb.-March 2006.

- IT investments are not contributing to expansion of new markets and business opportunities (60%) – Responses from sales planning divisions of user companies （Source: JUAS** Corporate IT Trend Survey, 2007)
- Top reasons for dissatisfaction with IT vendor were insufficient new offering capability (61%), and insufficient technology (55%) – Responses from sales planning divisions of user companies (**Source: JUAS Corporate IT Trend Survey)

* LS Research: Fujitsu Family User Group LS Research Commission **JUAS: Japan Users Association of Information Systems

Structural Problems with System Integration and Countermeasures

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- Difficulty in determining user requirements
  - Senior management, end-users, and information system specialists all have different viewpoints
  - During system integration, system requirements are not transparent (“black box”)

  - Prevent wasted expenses caused by postponing the determination of requirements
  - Train employees to talk with customers from a business perspective

- System vendors’ lack of manufacturing innovation capability
  - Appropriateness of estimates unclear
  - Poor approach to development

  - Reform subcontracting structure, an area where there is little know-how development currently
  - Implement a disciplined work style where manufacturing responsibility is clear

2. Four Innovation Initiatives

Four Innovation Initiatives

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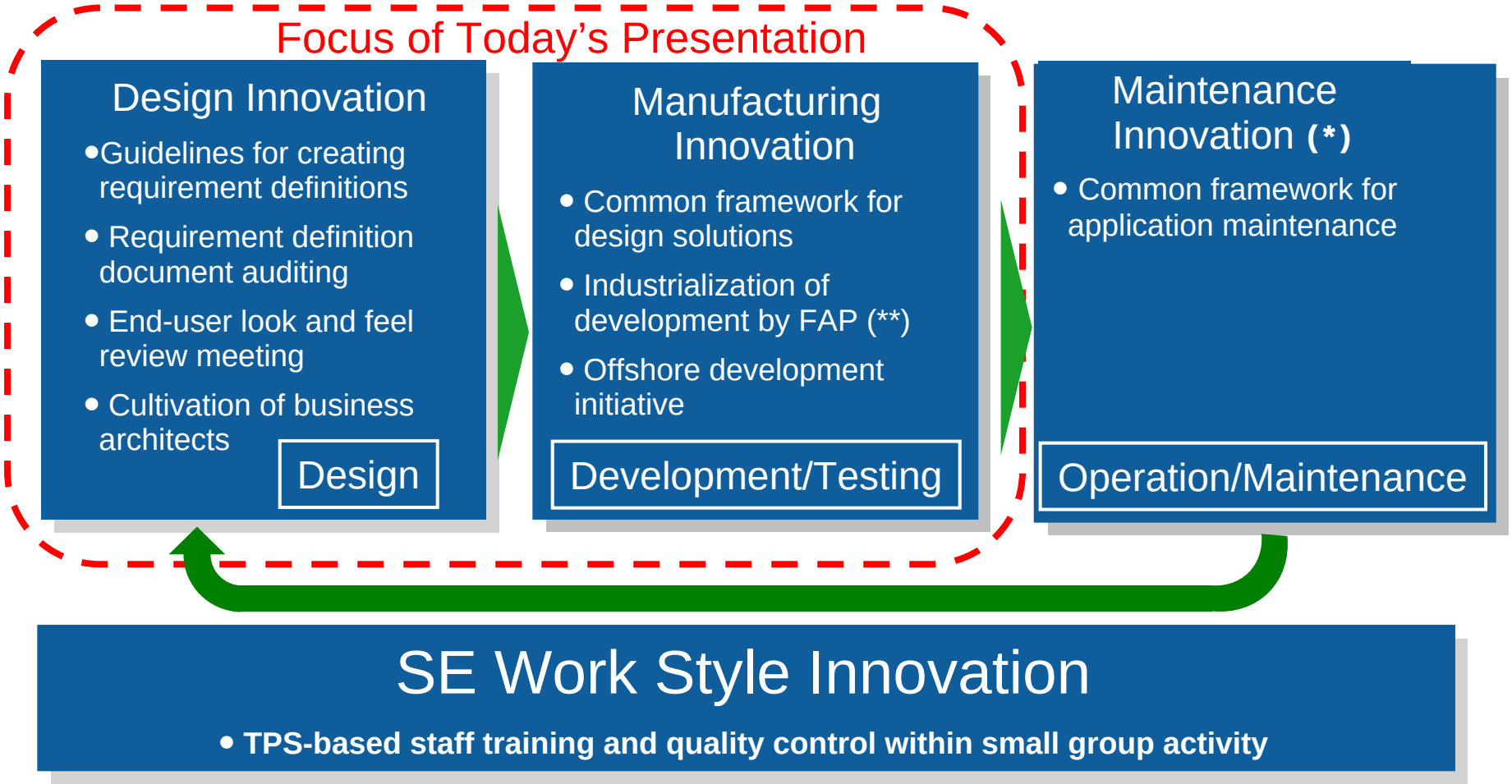
- **Eliminating structural problems that cannot be solved with traditional development technology**



*: Establishment of service and work scheme in support of system operation and maintenance (announced May 14, 2007)

**: Fujitsu Applications, Ltd.

System Development Cost Structure: 1:6:1:2 Rule

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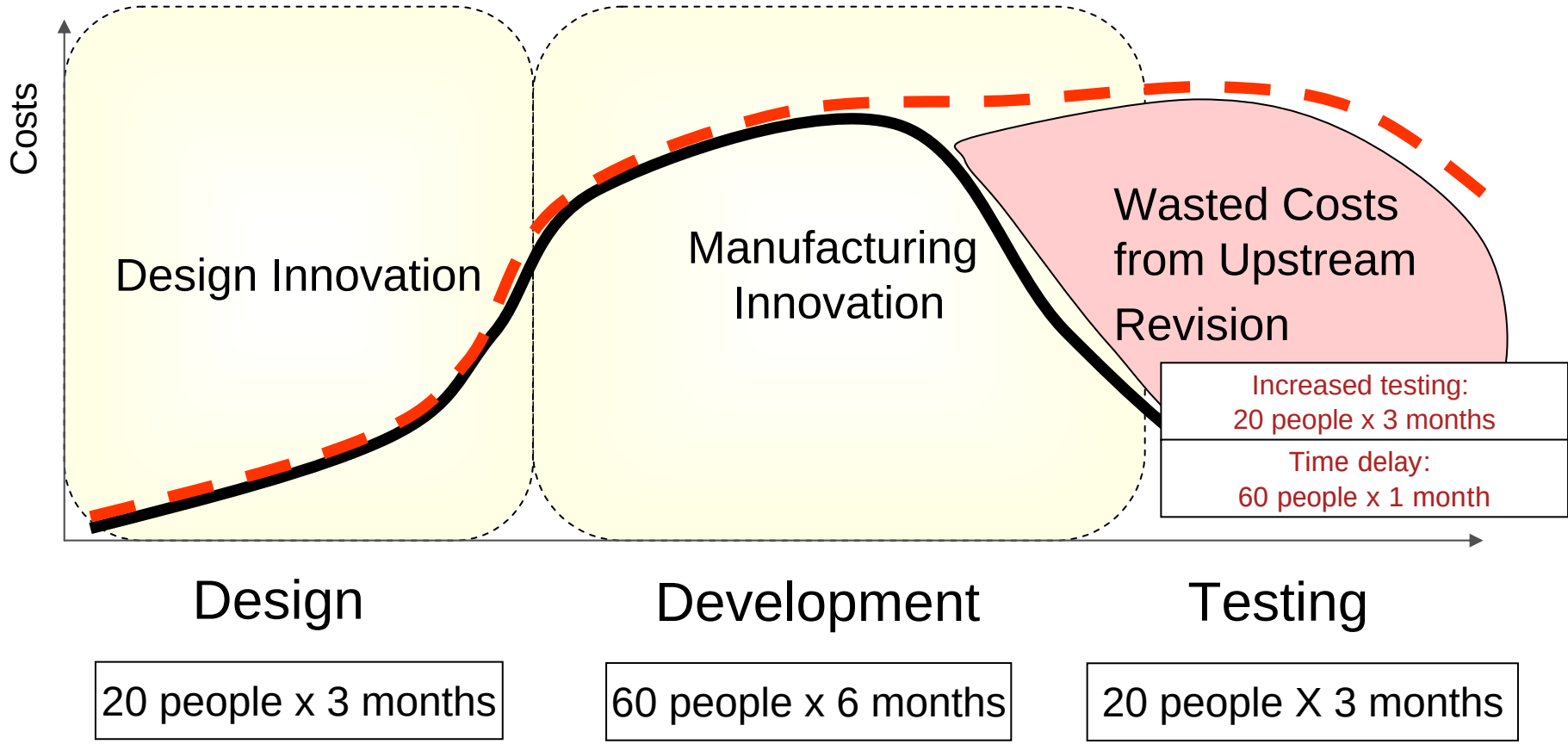
- **Postponement of final specification during design process results in revision during test stage (wasted costs), adding cost without creating value.**



3. What is Design Innovation?

What is Design Innovation?

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- **Improving design quality and preventing delays by requiring third-party review (SI assurance)**
  - **Devise written guidelines for determining requirements**
    - **Based on IPA-SEC (*) index, create guidelines for proper upstream processes**
    - **Disseminate and inculcate importance and description of determining requirements to in-house SEs (4,000 people completed training in most recent year)**
    - **Three viewpoints: Availability of Documents, Consistency, Affordability**
  - **Requirement Definition Auditing**
    - **Evaluate quality of requirements document from third-party perspective and suggest improvements to project**
- **Training staff to support above-upstream process**

***IPA-SEC: Information-Technology Promotion Agency, Japan - Software Engineering Center**

Requiring Third-party Review Process

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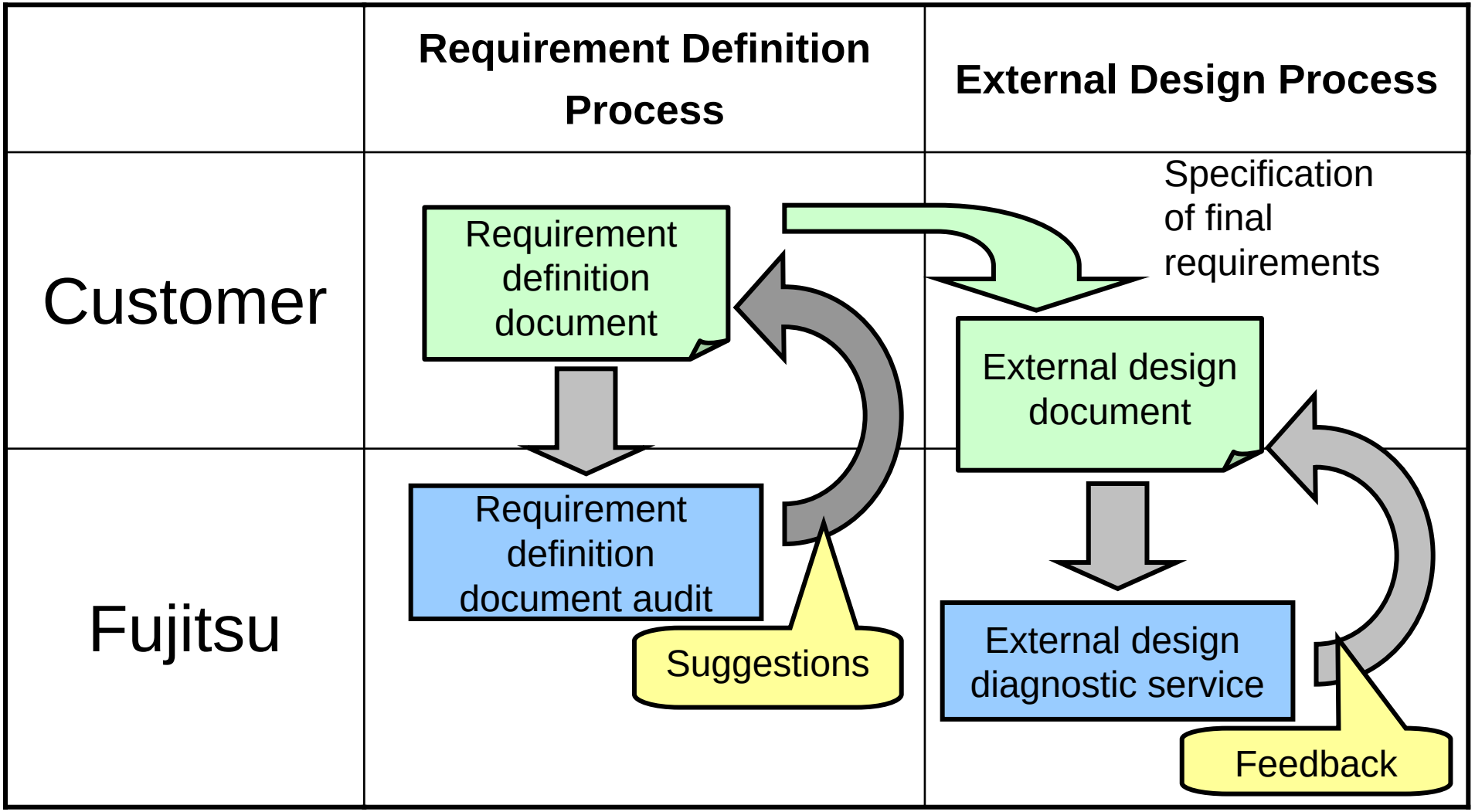
- **Making audit of requirement definition document obligatory for SI proposals exceeding a certain scale**



Above-upstream Process Defined by IPA-SEC

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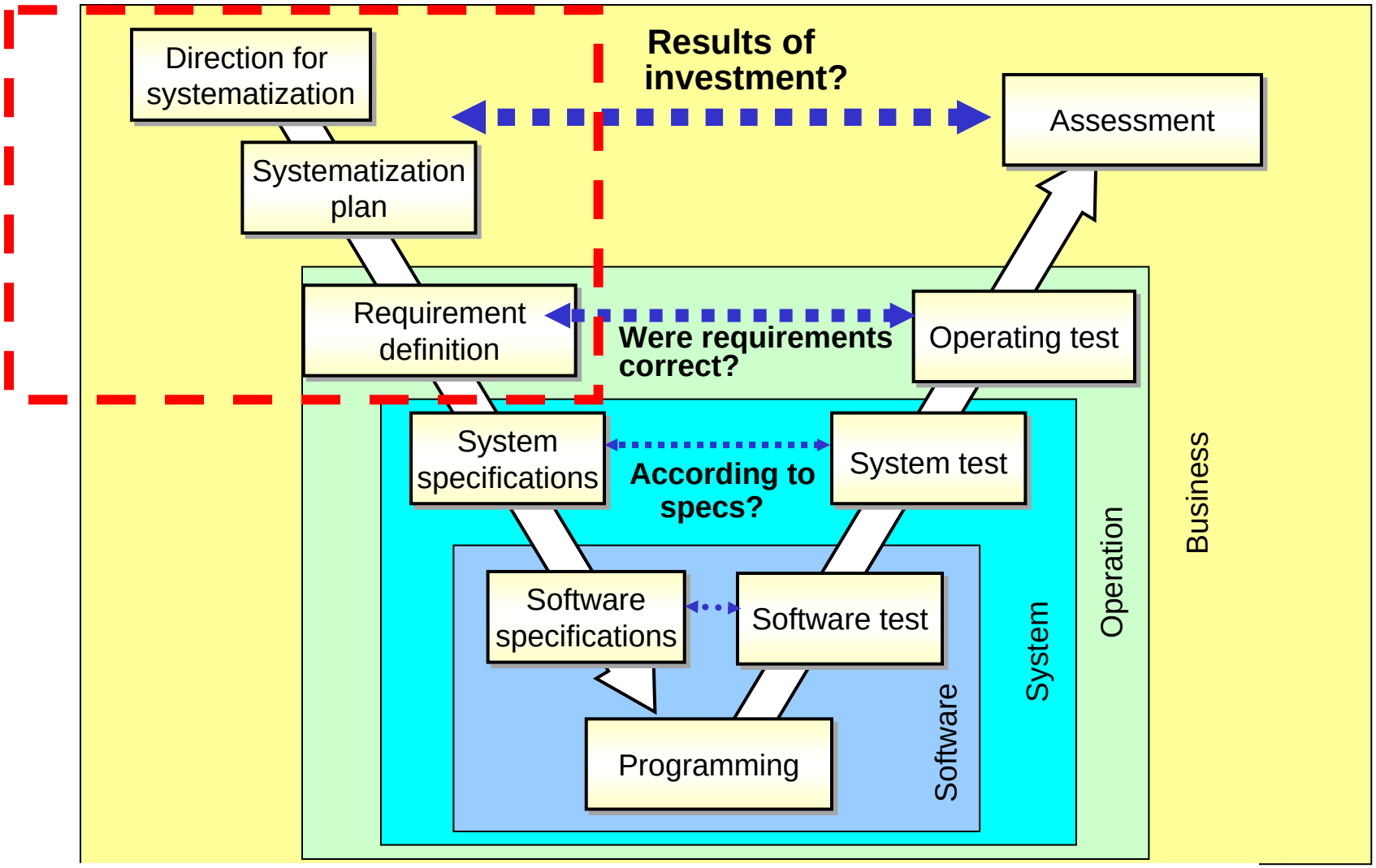
Above-upstream Process



From “”Ensuring Required Quality, with the Planning Involvement of Senior Management” (SEC-BOOKS)

Training Employees to Support Above-upstream Process

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What is a Business Architect (BA)?

- Offers high added value by identifying and analyzing the customer's needs and defining operating requirements that reflect their essence
- Commenced training program in 2006; expecting to train 300 people in 3 years (six-week group training)

Role of Business Architect

Process	IT planning	Request for Proposal	
		Business requirement definitions	System requirement definitions
View-point	Senior managers' viewpoint	End-user viewpoint	Developer viewpoint
People in charge	Customer and consultant (Why)	Customer and business architect (What)	Upstream SE (How)

Above-upstream Process

4. What is Manufacturing Innovation?

What is Manufacturing Innovation? (1/3)

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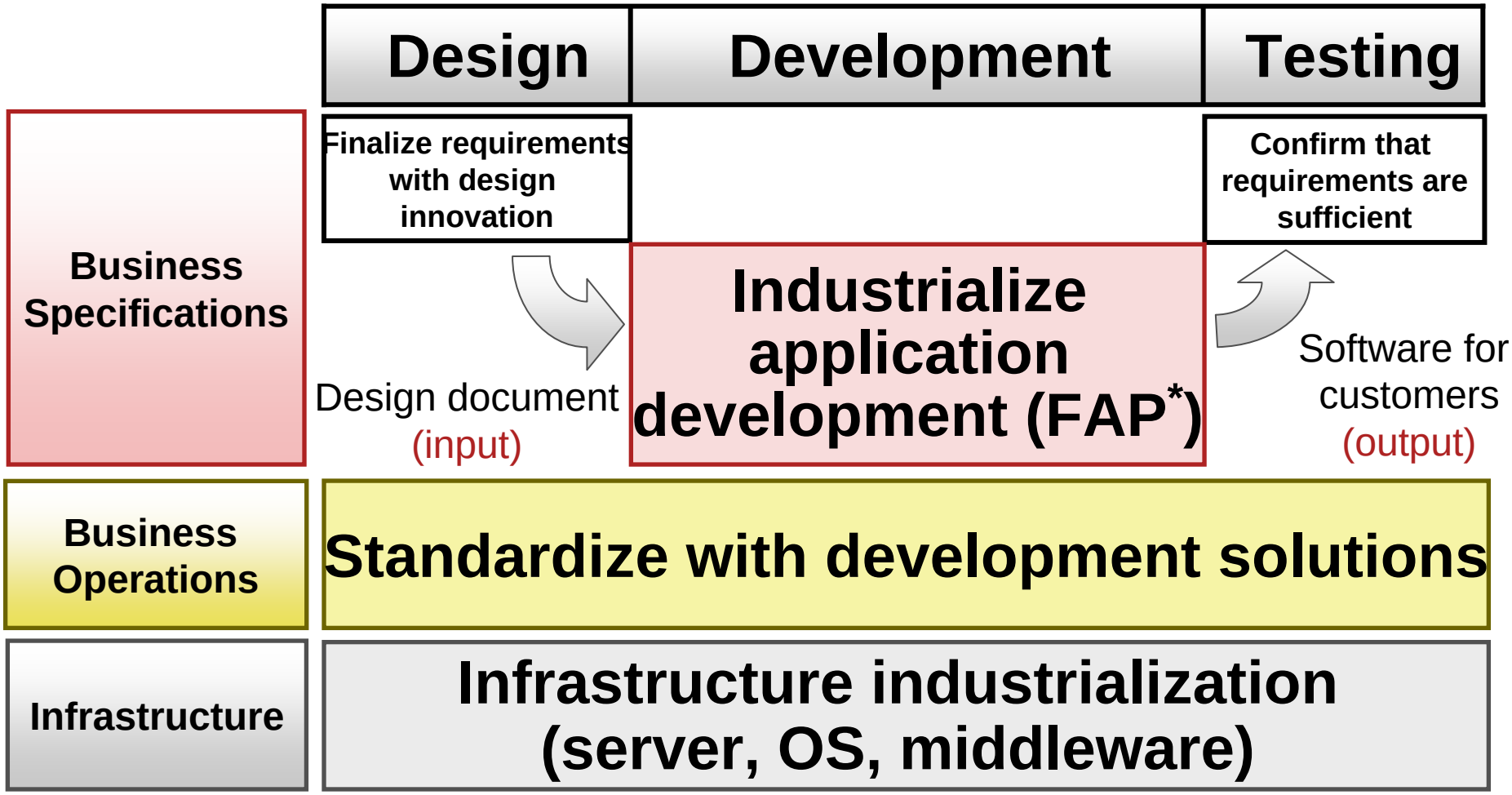
- **Industrialize development of business specification layer which is tailored to meet each customer's order**



∗ FAP: Fujitsu Applications, Limited

What Is Manufacturing Innovation? (2/3)

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Ensure efficiency and quality by industrializing application development

- Common framework initiatives (use of development solutions)

  - Automate programming through the standardization of application architecture and development processes as well as design documents
    - For Java (EZDeveloper, Topjax, QuiQpro)
    - For .NET (QuiQpro, WebAS, eProad)

- Initiatives to industrialize application development process
  - FAP will implement application development industrialization and internal manufacturing initiatives
  - Autonomous improvement activities will take root based on “Four Rules” and “Six Mechanisms”

What Is Manufacturing Innovation? (3/3)

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Offshore development initiatives

- In order to compensate for shortage of engineers in Japan, procurement will be made offshore based on the FAP model, and human resources, including those of partners, will be concentrated in design activities.
- Accumulate and utilize production know-how by repetitive development based on improved design precision and use of common framework for design and production.
- Use China as principal base for off-shoring from Japan.

(India to be mainly used by Fujitsu overseas subsidiaries in the short term, and by Japan in the medium to long term)

5. Conclusion

Target Development Model for Manufacturing Innovation

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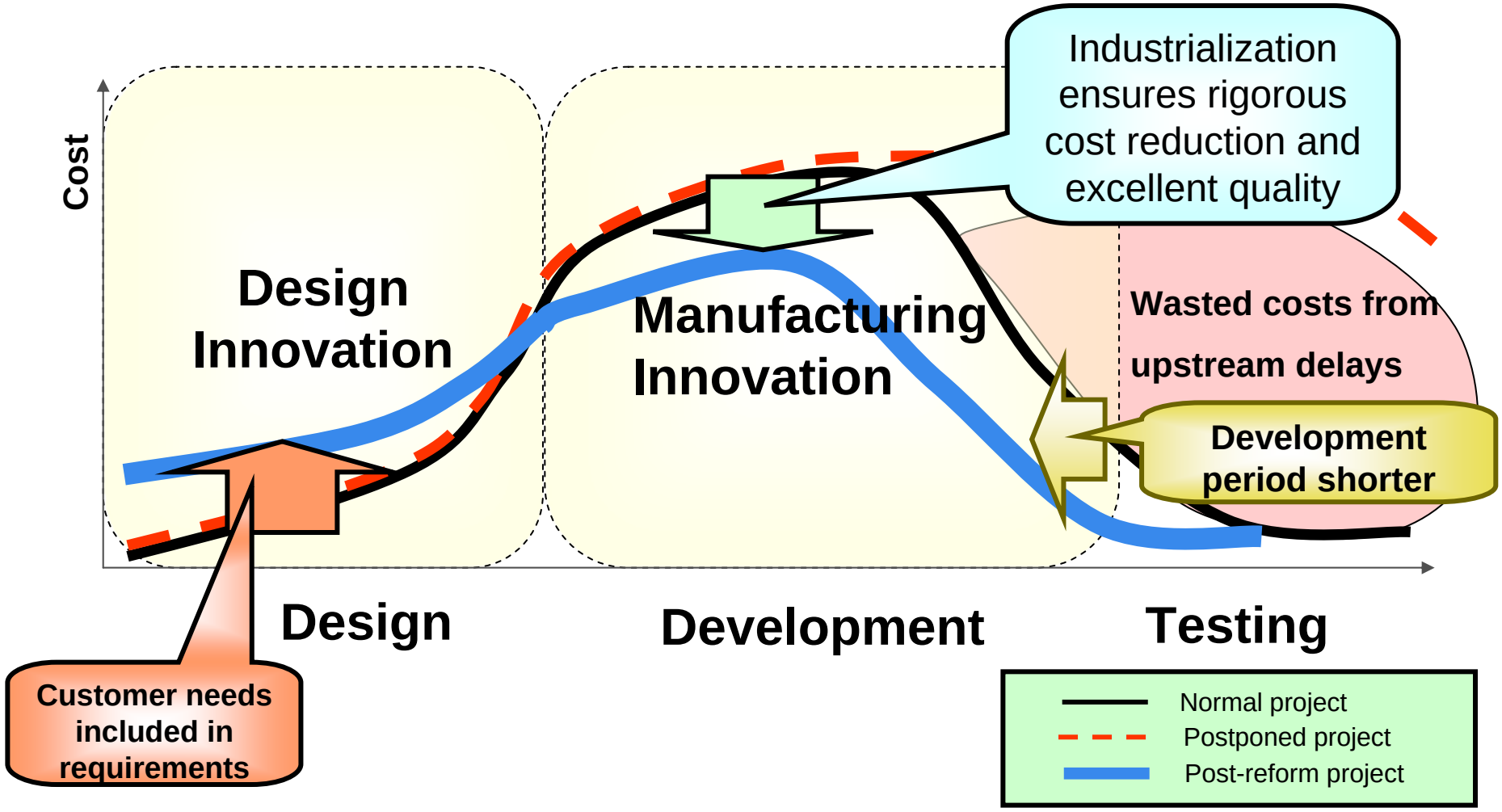
Realization of IT Systems Capable of Solving the Customers' Management Problems



Wrap-up

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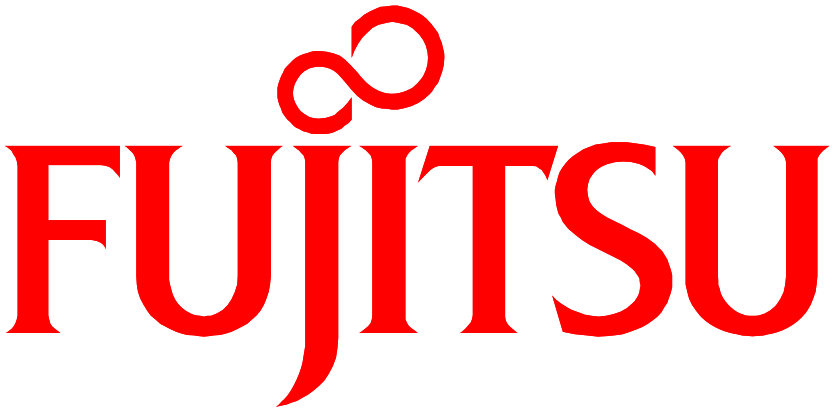
- Stronger risk management and other measures have helped Fujitsu's SI business recover.
- Our customers, however, are not satisfied with the results of their current IT investments.
- By implementing manufacturing innovation, we are reducing dead-weight costs from delays that do not create any value. This will assist the customers in saving cost, time, and human resources.
- Also, by strengthening our relations with customers, we can create IT systems capable of solving the customers' management issues, and improve the profitability of Fujitsu's SI business.

Putting customers' dreams into words, and translating those words into reality.



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