

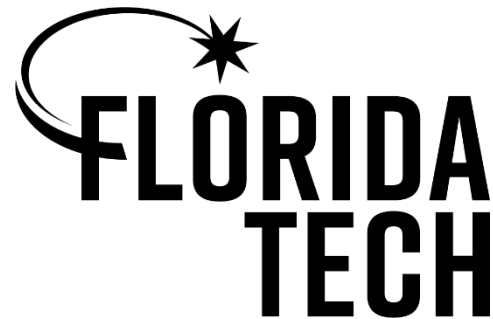
# SYS 5460: Stakeholders

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How the customer explained it



How the project leader understood it



How the analyst designed it



How the programmer wrote it



What the beta testers received



How the business consultant described it



How the project was documented



What operations installed



How the customer was billed



How it was supported



What marketing advertised



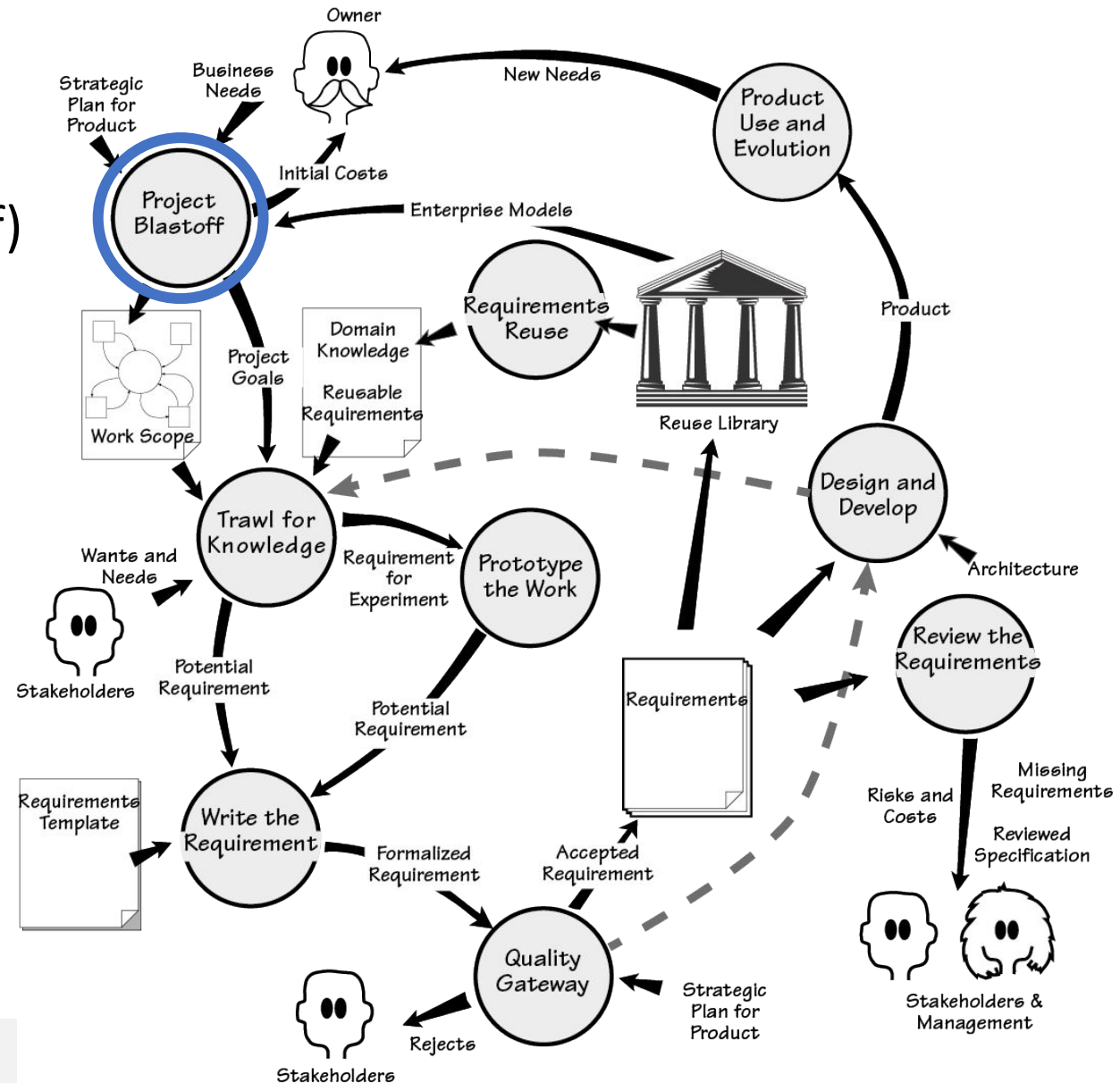
What the customer really needed

Requirements ultimately begin and end with people-Stakeholders (Alexander)

# Volere Requirements Process (Robertson)

A requirements elicitation process is recommended

## Project Blastoff (Kickoff)



We need to keep in mind the life cycle



# Project Blastoff (kickoff)

- The key purpose of project blastoff is to build the foundation for the requirements discovery, and to ensure that all the needed components for a successful project are in place.

- Involvement:

- Principal Stakeholder (sponsor)
- Key users
- Lead requirement analyst
- Technical business experts

- ▶ The **sponsor** provides development funding for a project
- ▶ The **champion** provides political support for a project

- ▶ Discussions:

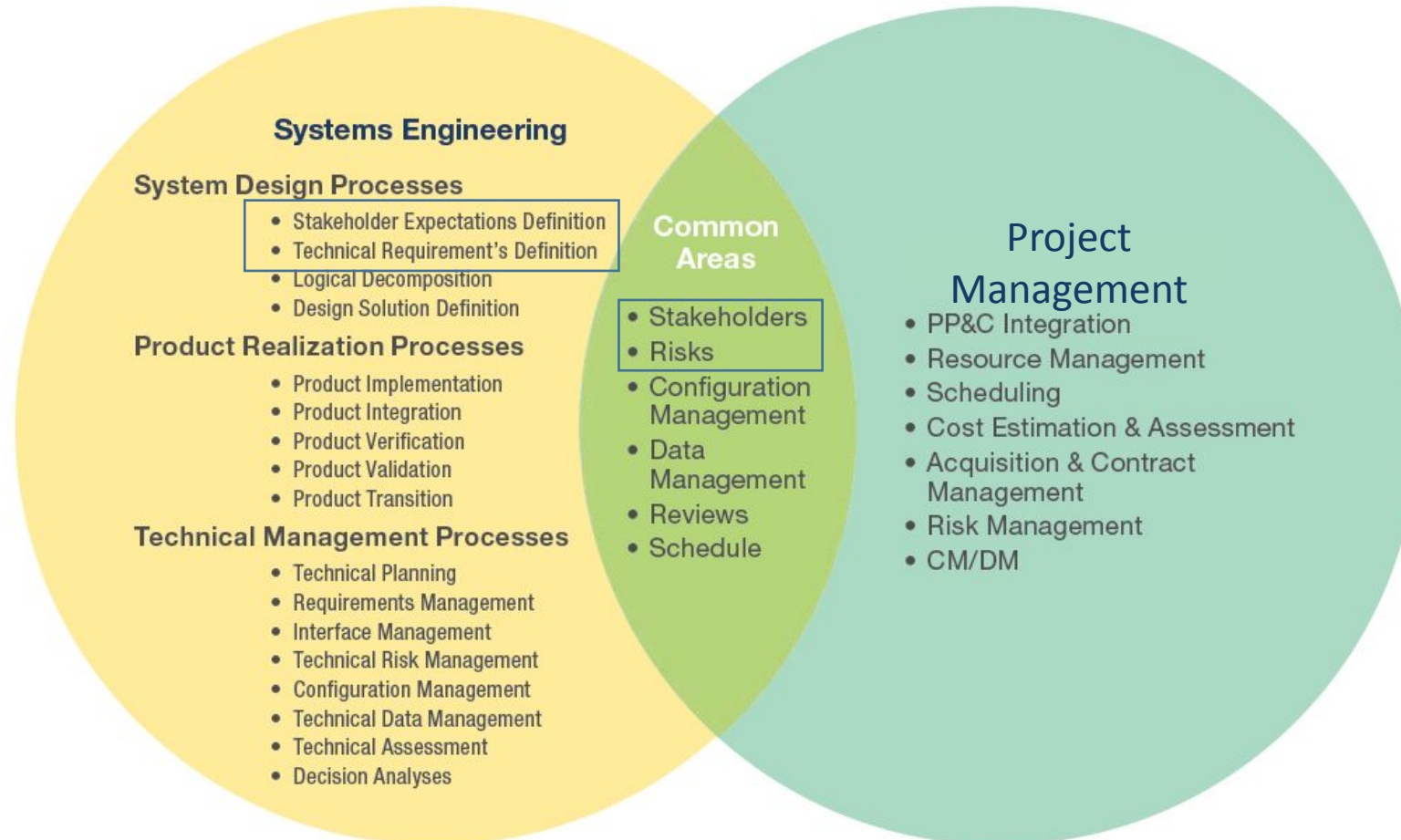
- < Purpose of the project
- < Scope of the work
- < Stakeholders
- < Constraints
- < Special terminology
- < Facts & Assumptions
- < Cost estimates
- < Risks

Outcomes:

- < Stakeholders
- < Project goals
- < Preliminary assessment of risk and costs
- < “go/no” go decision

# Requirements Process and SE (NASA)

- SE and project management are coupled
- Requirements is part of that intersection



# Systems Engineering Processes (NASA)

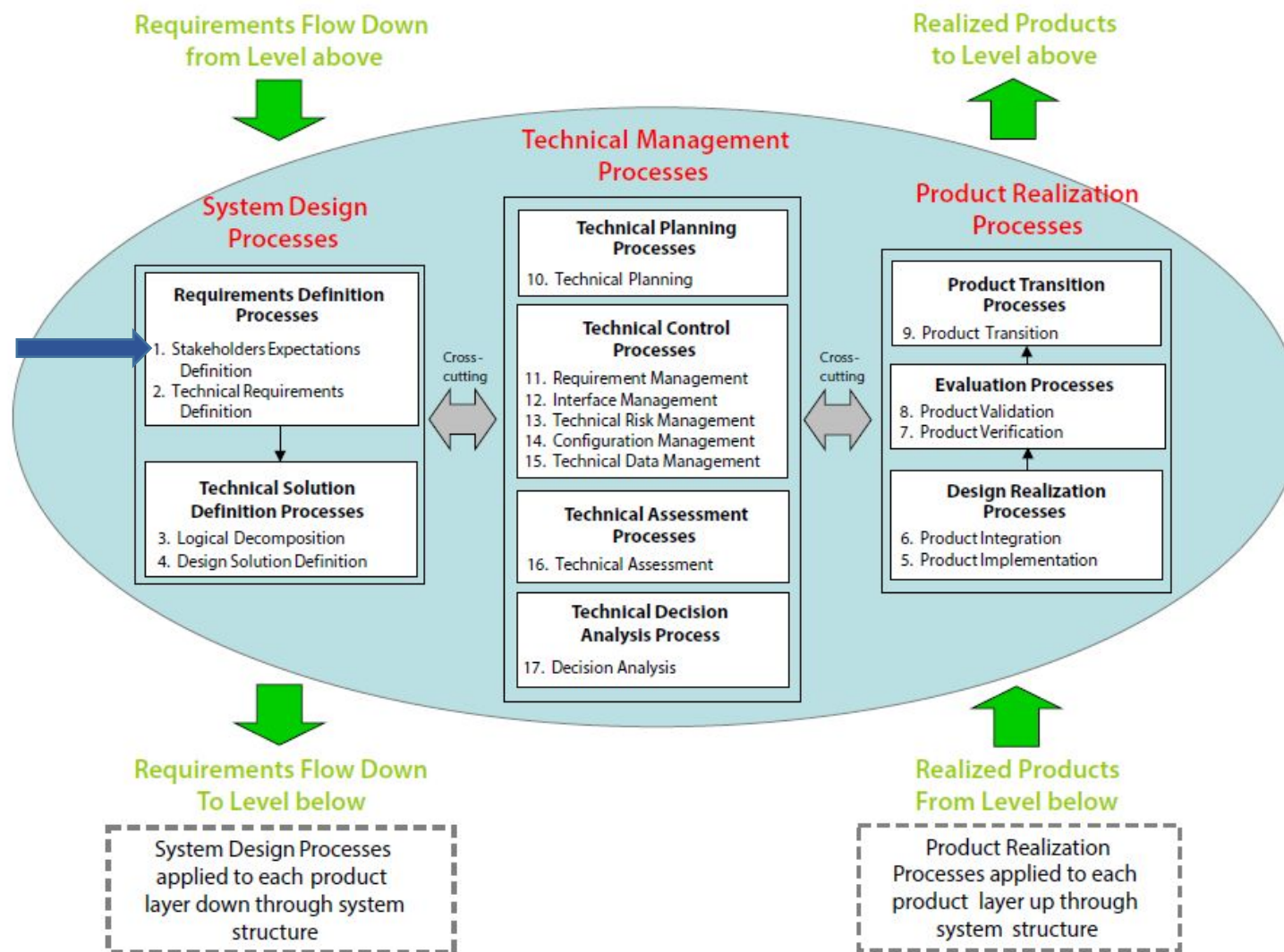


FIGURE 2.1-1 The Systems Engineering Engine (NPR 7123.1)

# System Design Process (NASA)

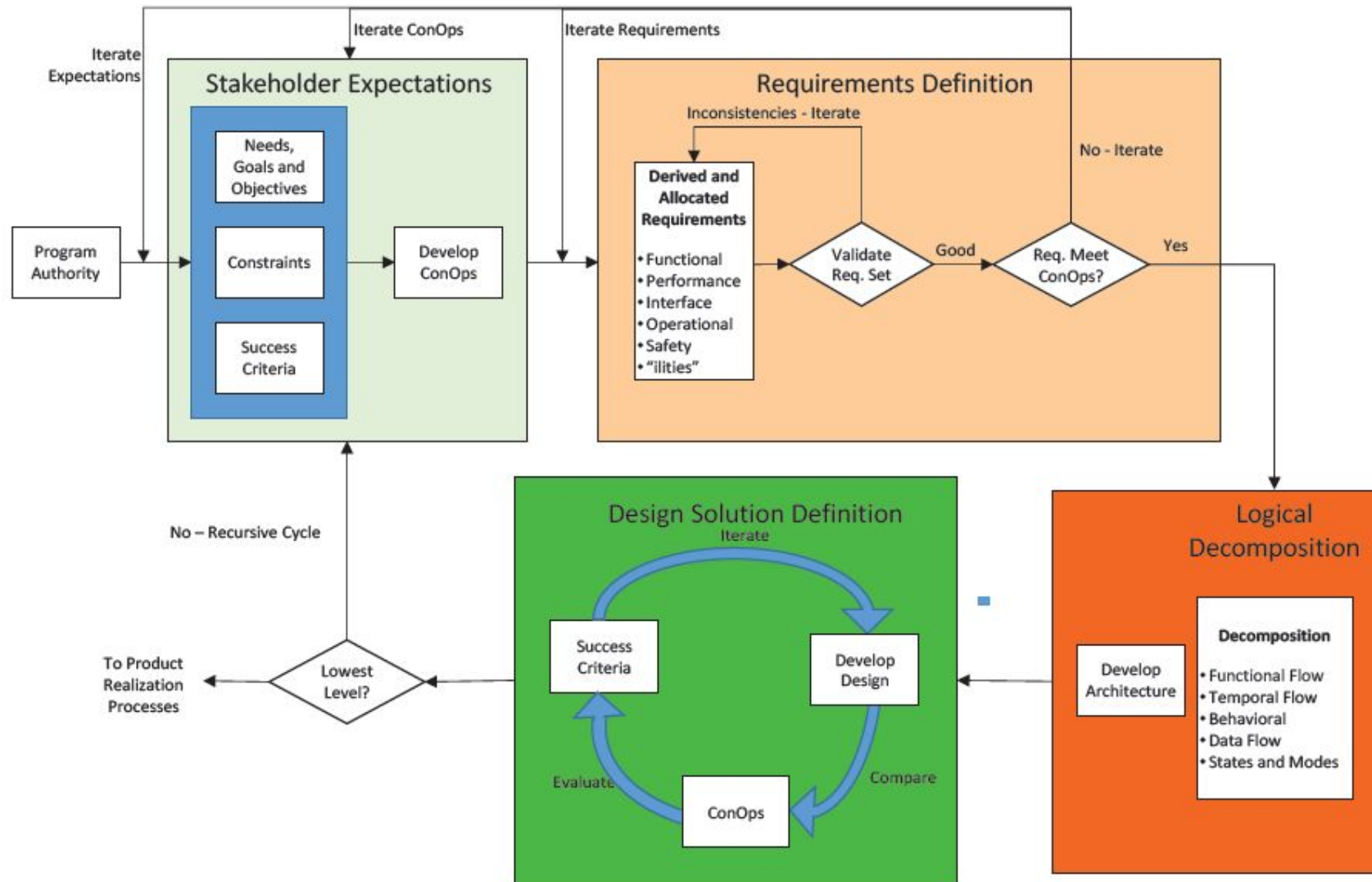
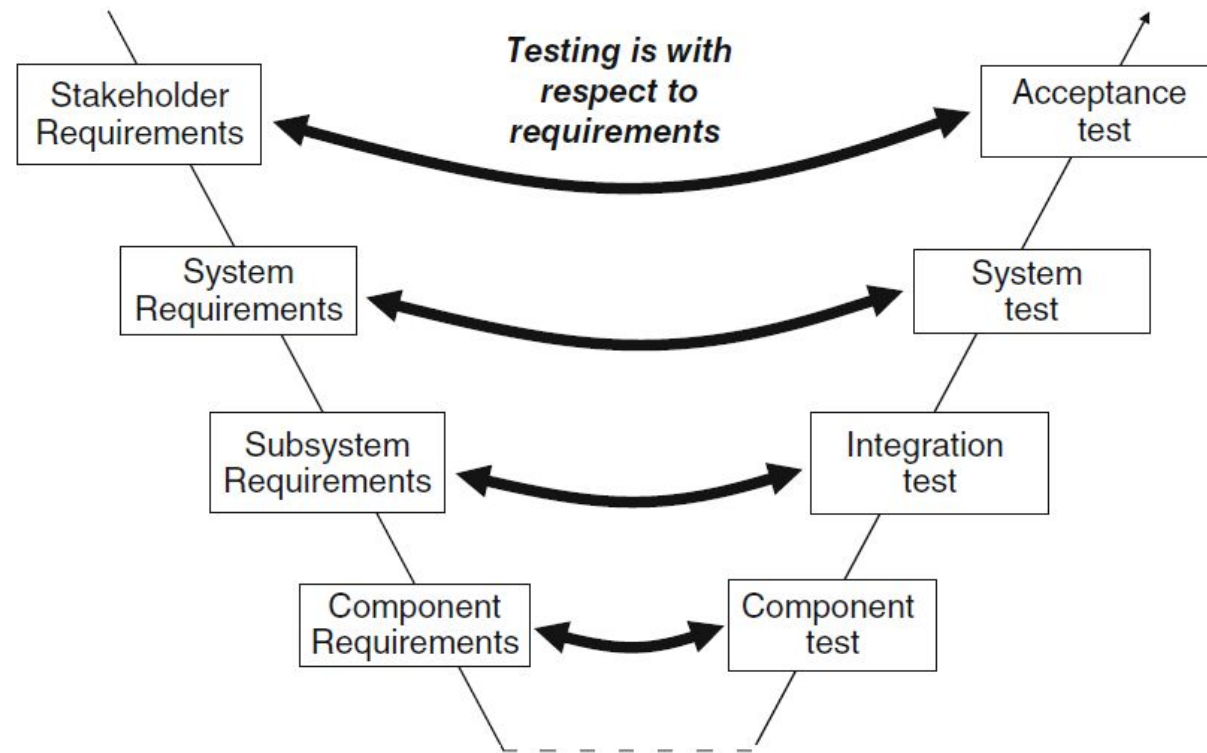


FIGURE 4.0-1 Interrelationships among the System Design Processes



**Requirements engineering:** the subset of systems engineering concerned with discovering, developing, **tracing**, analyzing, qualifying, communicating and managing requirements that define the system at **successive levels of abstraction** (Dick et. al.)



Identify: tracing and abstraction

Fig. 1.2 Requirements in the V-Model

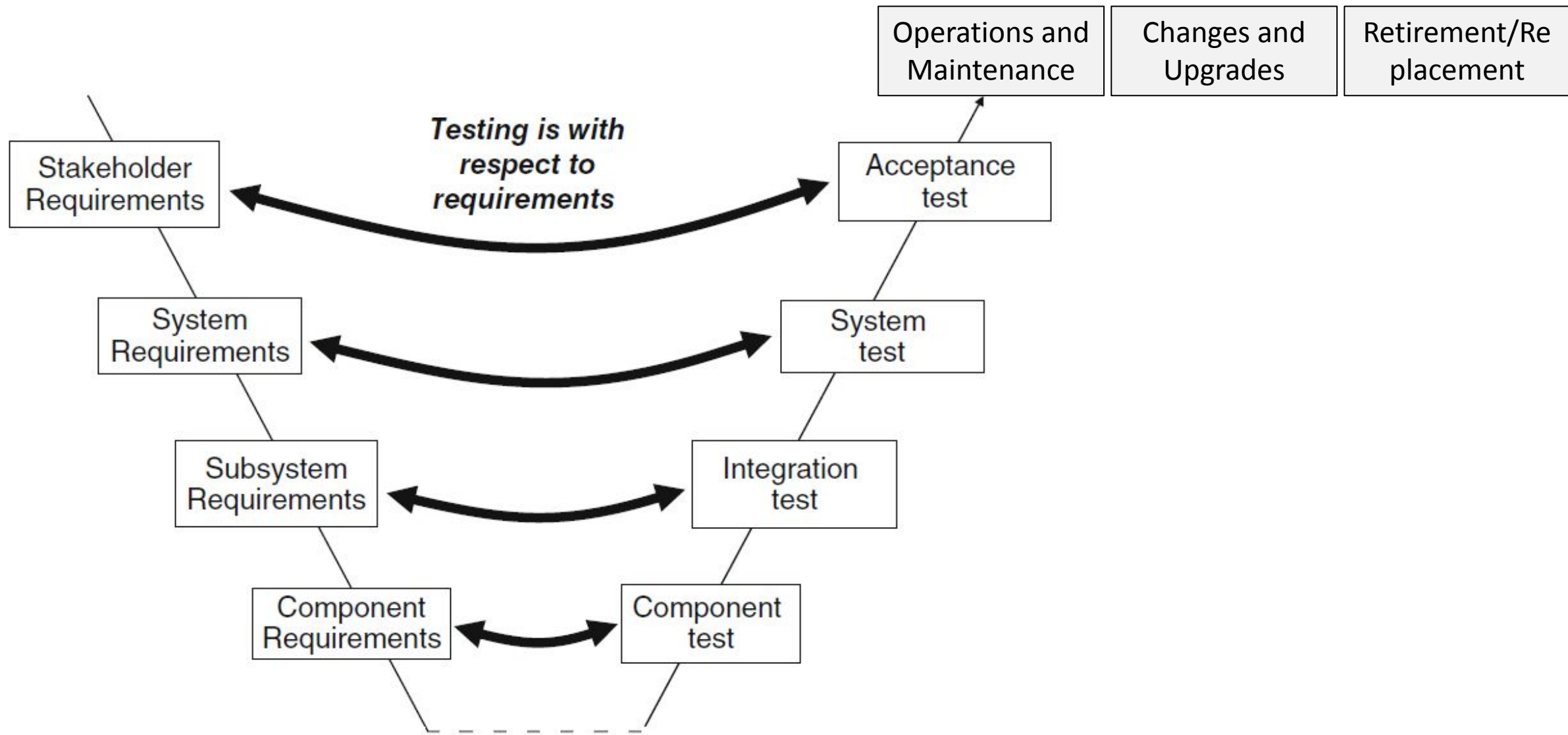
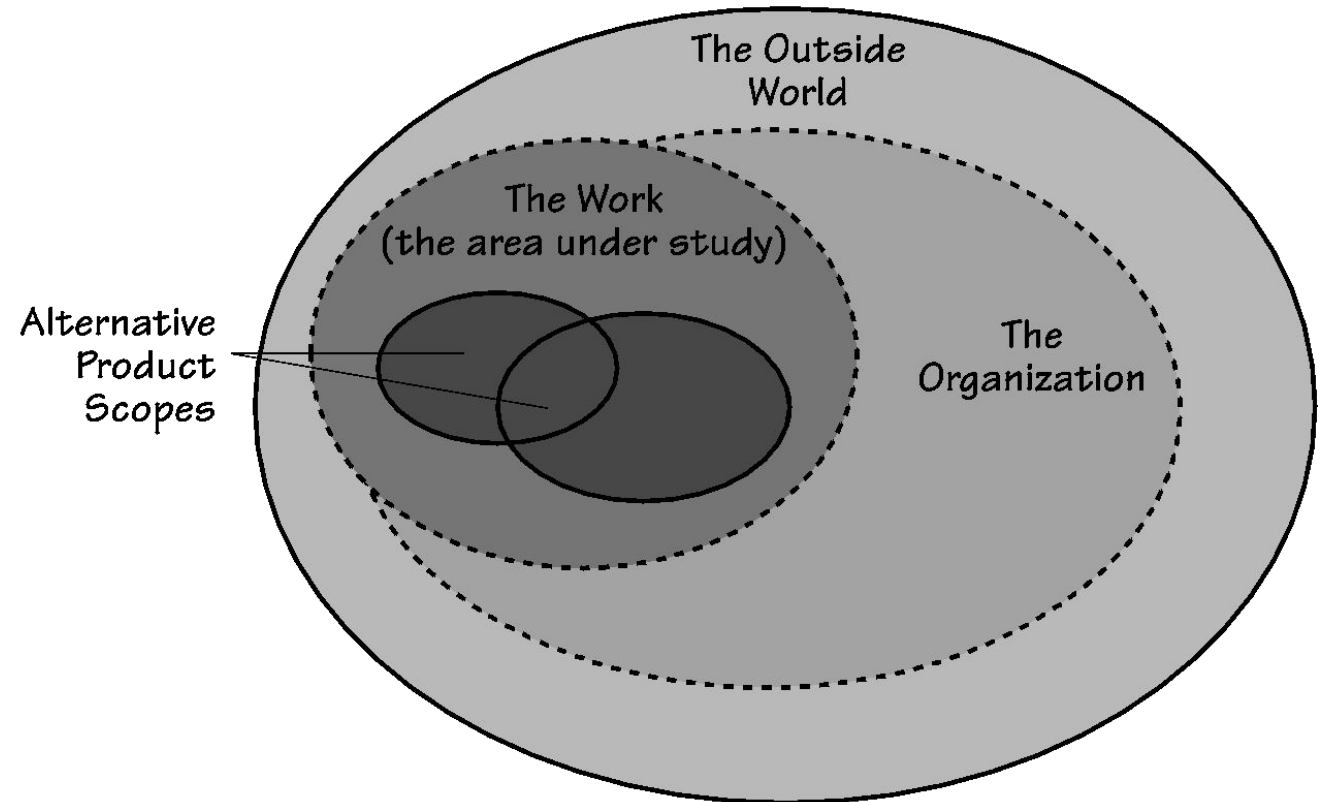


Fig. 1.2 Requirements in the V-Model

# System Scope (Robertson)

- The work is the part of the organization that you need to study to discover the requirements.
- The work is usually connected to other parts of the organization and to the outside world.
- You must study the work well enough to understand how it functions.
- This understanding will enable you to come up with alternative scopes for the product and eventually choose the one to build



# EXERCISE 1

- Think of a product that predicts where ice will form on roads and to schedule trucks to treat the roads with de-icing material
- Be prepared to tell the class what your idea is.

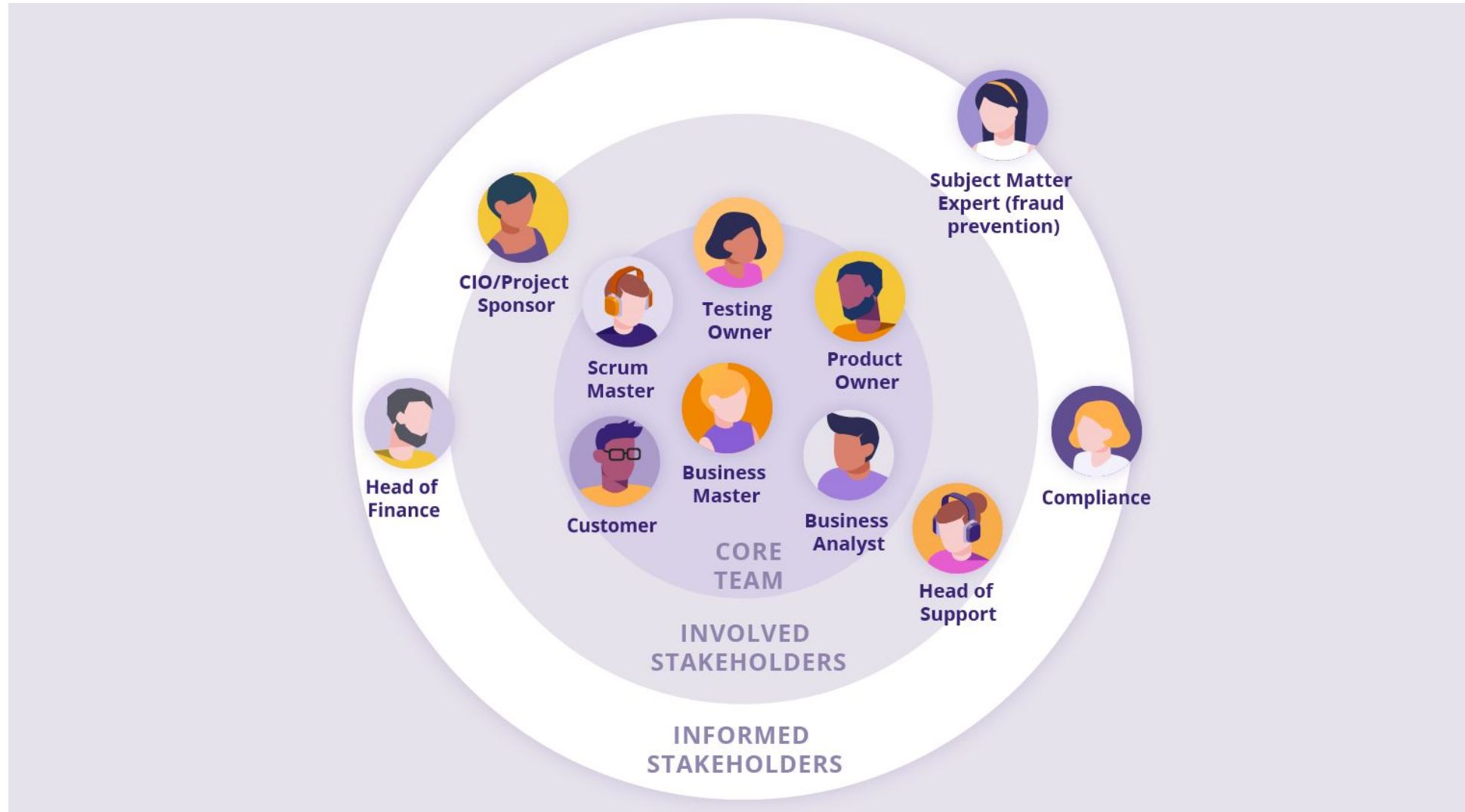




- **Stakeholder**: An individual, group of people, organization or other entity (system) that has a direct or indirect interest (or stake) in a system
- A stakeholder's interest in a system may arise from (Dick et. al.):
  - **using** the system,
  - **benefiting** from the system (in terms of revenue or other advantage)
  - **being disadvantaged** by the system (in terms, for instance, of cost or potential harm)
  - **being responsible** for the system
- Identify stakeholders by:
  - Asking sponsor or client
  - Examining and organization chart
  - Using a template (onion model)
  - Comparison with similar projects
  - Analyzing the context of the project

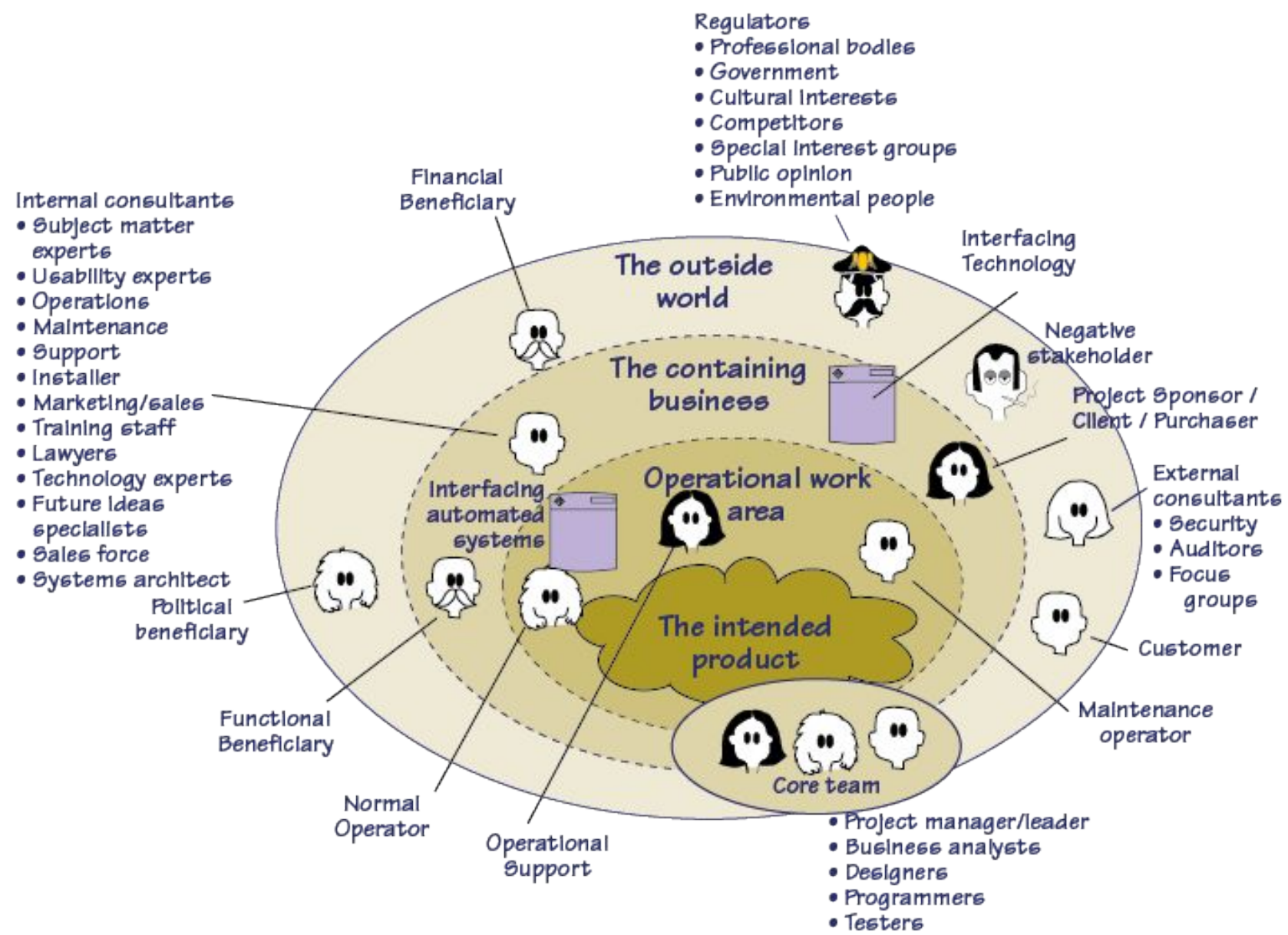
- Identify Stakeholders. ...
- Analyze Stakeholders. ...
- Map Stakeholders. ...
- Prioritize Stakeholders. ...
- Be Inclusive. ...
- Communicate Clearly. ...
- Be Open and Honest. ...
- Remain Available.

# Stakeholder Map

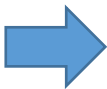
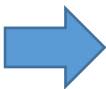




# Example: IceBreaker Stakeholders



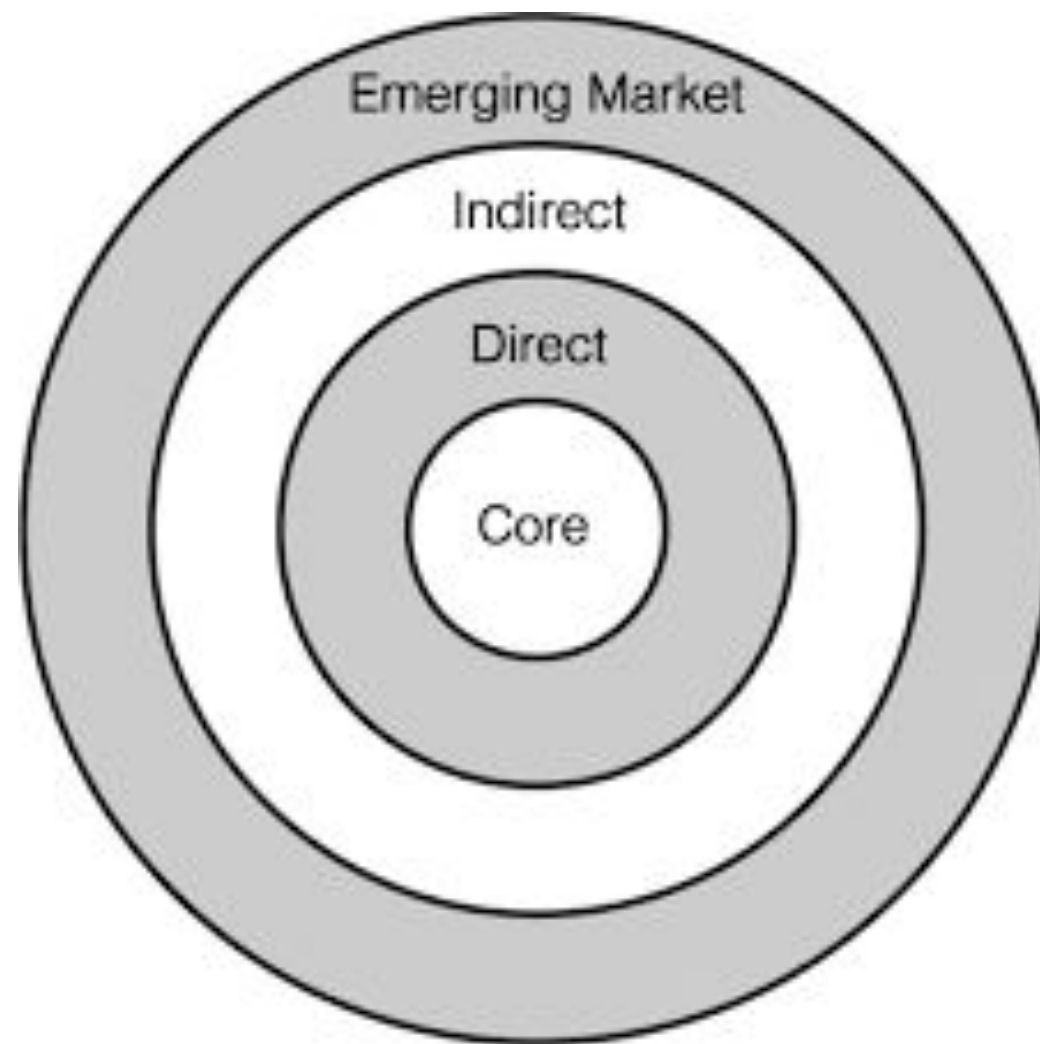
<b>Stakeholder Class</b> (Class of stakeholders who share a particular stakeholding in the project)	<b>Stakeholder Role</b> (The job title, department or organisation that might indicate a role for this class of stakeholder)	<b>Stakeholder Name</b> (The name(s) of the responsible stakeholder(s) or their representatives)	<b>Stakeholder Rationale</b> (Why does this stakeholder need to be involved? Consider benefits and Impacts)	<b>Necessary Involvement</b> (Estimate of when and how much time)
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Goals	Business Constraints	Technical Constraints	Functionality	Look and Feel	Usability	Performance	Safety	Operational Environment

# EXERCISE 2

- In your groups, Identify as many stake holders as possible for the proposed system
- Identify as many interactions as possible
- Prepare to share with the class





# Surrogate Roles

- Many roles including paid work are surrogates (on behalf of someone else):
  - Company director represents shareholders
  - Lawyer represents a plaintiff
  - User interface designer represents human operator
- In some cases the requirements engineer may not be able to talk to the actual users (large multi-year projects)
- Multiple groups of user for the product
- **Surrogacy can be dangerous** if people are wrong about the needs and wishes of the people they claim to represent



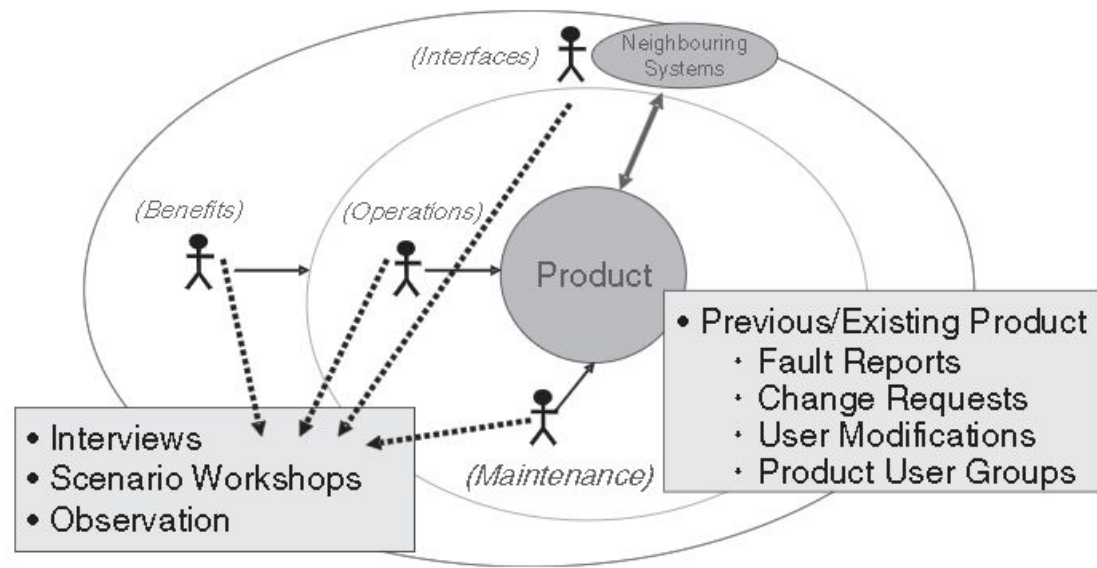
# Operational Roles in the System

Stakeholder role	Type of requirement	Discovery technique
Normal operators (possibly in many different roles)	Scenarios (Chapter 5) Usability (Chapter 6)	Interview (Chapter 10) Apprenticing (Chapter 10) Observation (Chapter 10) Workshops (Chapter 11) Data modelling (Chapter 8) Prototyping (Chapter 12) Archaeology (Chapter 12)
Interfacing	Interface definitions (Chapter 4)	
Maintenance	Maintenance functions/scenarios (Chapter 5) Diagnostics, built-in test	
Support	Support functions	
Functional beneficiary	Product functions/scenarios (Chapter 5) Performance targets (Chapter 9)	
Financial beneficiary	Mission, objective (Chapter 3)	Interview (Chapter 10) Read policy documents
Regulator	Regulations, laws, standards, guidance Responses to safety case, compliance statements, etc	Legal advice on regulations, etc Negotiate compliance
Experts, specialists in disciplines	Safety, security, reliability, usability, etc (Chapter 6) Constraints (Chapter 6)	Analysis, simulation, modelling, standards
Manufacturer	Producibility	Interview (Chapter 10) Workshop (Chapter 11) Prototyping (Chapter 12)
Marketing (surrogate, on behalf of mass-market customers)	Mass market (consumer) Preferences by group (age, income, etc)	Market survey, Field trials Observation (Chapter 10) Prototyping (Chapter 12) Analogous products (Chapter 12) Competitor analysis
Product manager, purchaser	Priorities Programme, schedule Budget (cost)	Prioritisation (Chapter 13) Trade-offs (Chapter 14)
The public	(Lack of negative impact)	Public meetings, Focus groups, Consultation, Roadshows

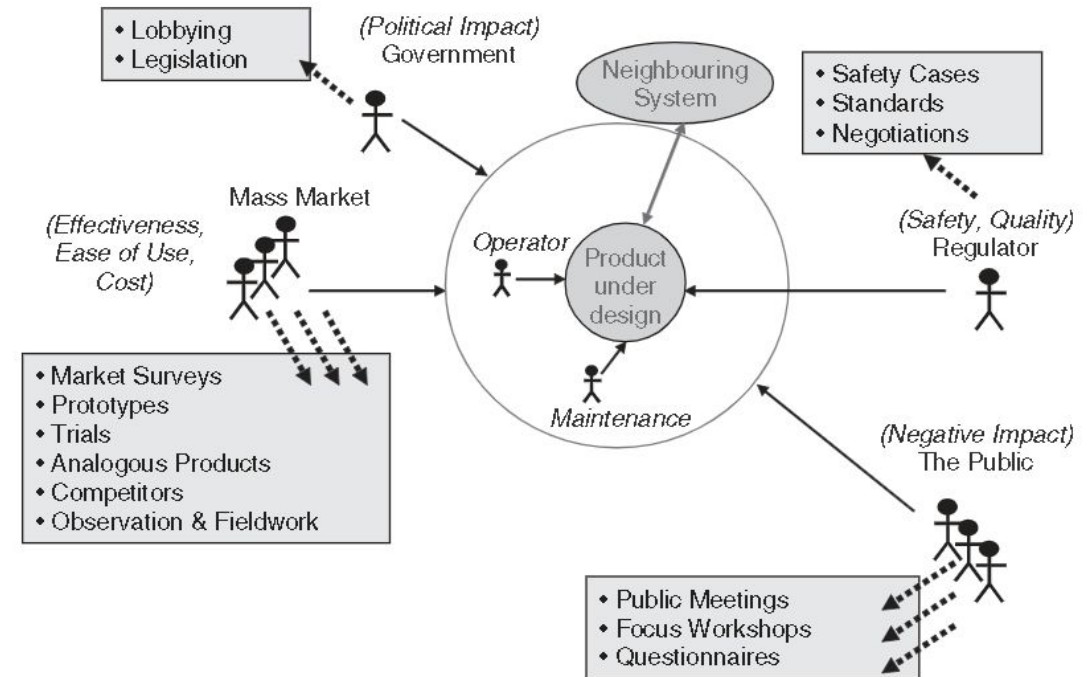
- Requirements can be discovered by the analyst based on existing systems or mathematical modeling
- Other requirements are coming from stakeholders
- The most likely roles that may contribute with the majority of the requirement is listed in the table

# Deriving Requirements from Stakeholders

- Goal and scenario modeling are useful tools to obtain requirements from stakeholders
- Surveys, public meetings are the recommended tools for non-operational stakeholders



**Figure 2.6:** Requirements from operational stakeholders.



**Figure 2.7:** Requirements from non-operational stakeholders.

- A goal is something that the stakeholder wants to achieve
- Goals are permitted to be neither fully achievable nor measurable (at the beginning)
- Requirements are achievable and measurable
- Goals!=requirements
- Requirements analysis function refines the goals into realistic and measurable target
- Goals may be in conflict (examples)
- Project without goals are vulnerable to pressure to add requirements
- Unstated conflicts lead to tension and confusion
- Stated conflicts can be used in tradeoff analyses

(Stakeholder) goals	(Product) requirements
Belong to different stakeholders	Agreed by all
May conflict, indicating design trade-offs; these often drive project design activity and the choice of life cycle (e.g. iterations with analysis or prototypes of competing options, to reduce risk)	Must not conflict in the chosen technology; therefore, design envelope must be known to a sufficient degree (leaving as much freedom inside that envelope as possible)
May be an ideal, unattainable, indicating what is hoped for	Must be realisable within limits of budget, timescale, technology, and skill available



# Goals

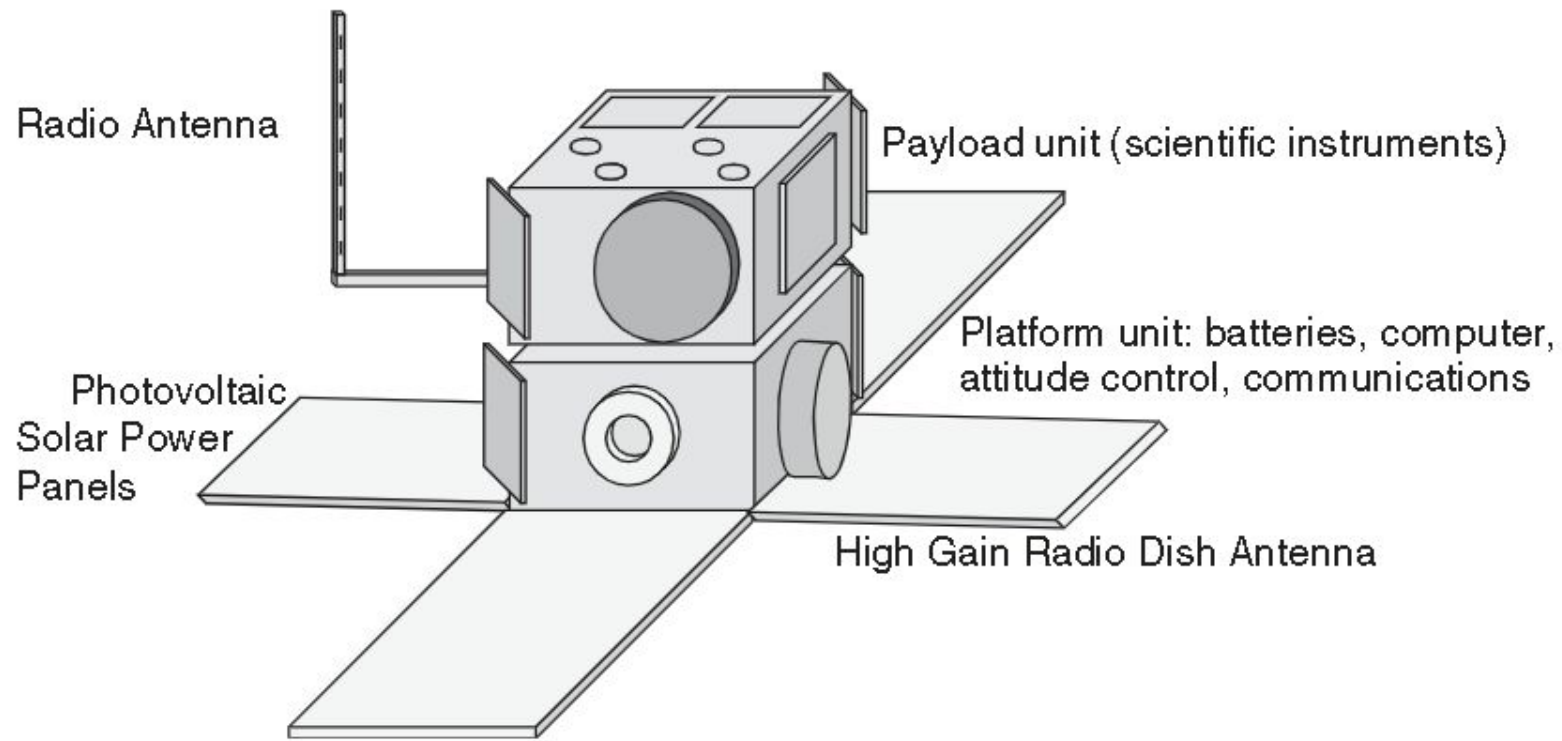
- Definition
- Goal diagrams
- Goal conflicts
- Examples

- Highest level ,large scale goals are mission statements
- Long lived goals are usually policies
- Low-level goals are functions
- Goals turn into requirements when:
  - Fully verifiable
  - Prioritized

- Goals can be functional or quality
- Functional is to do something (carry passengers)
- Quality goal refers to the way something is done (e.g. comfort)

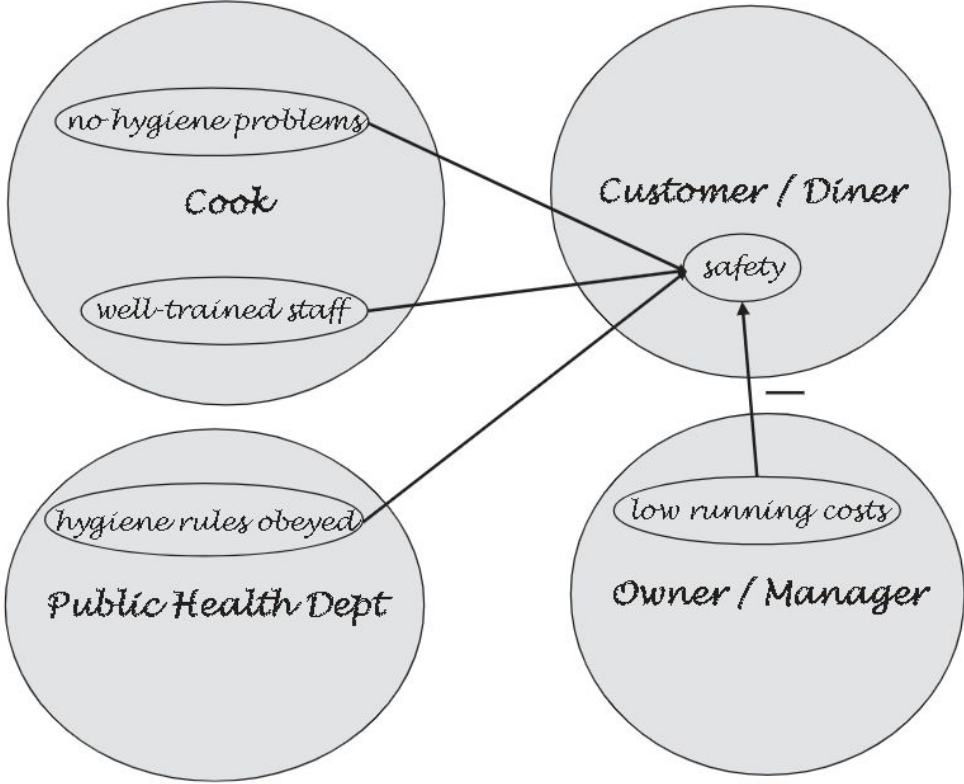
# Example: Spacecraft

- To fly in space
- To do worthwhile science
- To send the results back to earth



# Example: Restaurant

Role	Cook	Owner/ manager	Customer/ diner	Supplier	Public health department	Taxman
Goals	Good pay Reputation No staff absences ...	Profit Top chef Low running costs ...	Good food Value for money ...	Paid on time, in full	Hygiene rules obeyed	Correct tax paid on time



# Tips for Discovering Goals

- Start with the people you know
- Identify stakeholders
- Use interviews and workshops to find out what their goals are
- Listen carefully for signs that goals may in conflict
- For specific feature request , ask why?
- Play back what you have heard to confirm that your interpretation is accurate



# Stakeholders in AGILE

# Stakeholders in Agile Development: Personas

- Story about an invented person that includes:
  - Name
  - Age
  - Job
  - Family
  - Hobbies
  - Residence
  - Favorite food
  - Attitude towards technology, money
  - Include a graphical representation
- Summarize persona in a profile



## Who: Make a Persona

**“Mary”**



### Behaviors

- Has a housecleaner
- Buys take-away 3 nights/wk
- Frequently feels overwhelmed when she “forgets” something

### Demographics

- Working mom
- 34 years old
- Lives in Reading, works in London
- Married, 2 kids
- Household 125k/yr

### Needs & Goals

- Help! Running errands, managing kids, keeping things running
- Time for her girlfriends
- To feel like she “has it sorted”
- “To clone herself”

Excerpt from Luxr.co: <http://www.slideshare.net/clevergirl/luxr-oneday-workshop>






- Create a product vision
  - Use a product vision board template

## Vision Tips:

- **For:** Stakeholders
- **That:** Needs , goals
- **The:** Product
- **Is A:** Description
- **Which:** Function main benefit
- **Differently:** Than current methods/products
- **Our Product:** Additional Benefits

## THE PRODUCT VISION BOARD

 romanpichler

 <b>VISION</b> What is your purpose for creating the product? Which positive change should it bring about?			
 <b>TARGET GROUP</b> Which market or market segment does the product address? Who are the target customers and users?	 <b>NEEDS</b> What problem does the product solve? Which benefit does it provide?	 <b>PRODUCT</b> What product is it? What makes it stand out? Is it feasible to develop the product?	 <b>BUSINESS GOALS</b> How is the product going to benefit the company? What are the business goals?

# EXERCISE 3

- In your groups, identify a product that can be completed within the scope of this class
- Product may be software, or hardware (3D printed Gadgets, small electronic assembly, etc.)
- Create a product vision board
- Prepare a 3 min presentation to share with the group
- You have 15 min

# References Used in this Lecture

- [1] S. Robertson and J. Robertson, *Mastering the requirements process: getting requirements right*, 3rd ed. Upper Saddle River, NJ: Addison-Wesley, 2013.
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- [4]“ISO/IEC/IEEE International Standard - Systems and software engineering -- Software life cycle processes,” *IEEE STD 12207-2008*, no. Generic, pp. 1–138, 2008, doi: 10.1109/IEEESTD.2008.4475826.
- [6] S. NASA, “NASA systems engineering handbook,” *Natl. Aeronaut. Space Adm. NASASP-2007-6105 Rev2*, 2016.