Scenario Brain Storming

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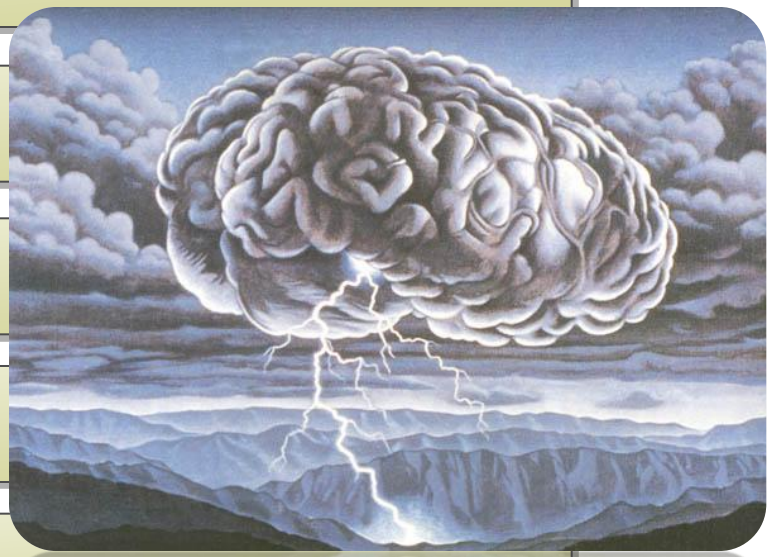
1. Prepare seed scenarios
2. Scenario brainstorming
3. Scenario consolidation
4. Scenario prioritization
5. Scenario refinement



Prepare seed scenarios

Facilitator prepares sample scenarios to illustrate the concept of scenarios.

Aim for roughly a dozen scenarios

The scenarios may or may not be useful in actual evaluation.

Seed scenarios

1	When content is tagged with a user defined tag or controlled vocabulary term, during peak usage, the system responds by making the content available via the appropriate RSS feed within 2 minutes. (use case scenario, quality attribute: performance)
2	When content is published with a user defined tag or controlled vocabulary term that one or more user has subscribed to, during peak usage, the system will send a notification email to each subscriber within 2 minutes of publishing the content. (use case scenario, quality attribute: performance)
3	When a user chooses to limit access to a document, the system will control access to the document by restricting access to the designated user(s) or users within the designated group(s). (use case scenario, quality attribute: security)
4	When a content server experiences a hardware or software malfunction that results in an inability to provide the designated service, the system will reroute service requests to an alternate server within 1 minute of the detection of the failure resulting in downtime of no more than two minutes. (exploratory scenario, quality attribute: availability)

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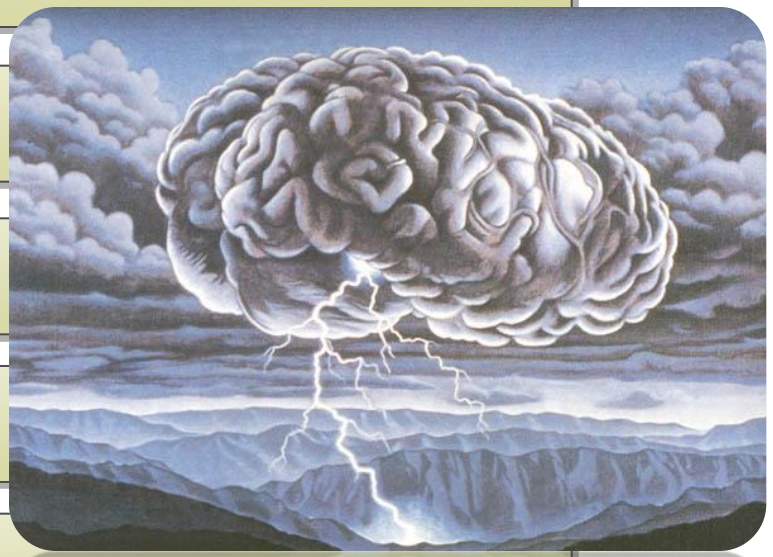


Scenario Brainstorming

Puts stakeholders in the same room and Elicit raw scenarios from the stakeholder community in round-robin fashion.

We ask the stakeholders to help us write them down the scenarios that satisfy their concerns.

A system is secure with respect to a specific kind of threat.

A system is modifiable with respect to a specific kind of change.

A system is reliable with respect to a specific kind of fault occurrence.

An architecture is buildable with respect to specific time and budget constraints.

A system performs well with respect to specific performance criteria.

When creating scenarios, it is important to consider all stakeholders

How the architecture should be re-used for a second product in a product line.

Customer

Scenario might talk about using the architecture to build the system or predict its performance.

Developer

Making a change to the system, such as upgrading the operating system or adding a new function.

maintainer

Different types of scenarios are used to probe a system from different angles, optimizing the chances of surfacing architectural decisions at risk.

For each quality attribute,
think of some scenarios
(*quality attribute scenarios)*.

Quality Attribute Scenario

Scenario	Description	Quality Att.
4	Dynamically replan a dispatched mission within 10 minutes.	Performance
27	Split the management of a set of vehicles across multiple control sites.	Performance, Modifiability, Availability
10	Change vendor analysis tools after mission has commenced without restarting system.	Integrability
12	Retarget a collection of diverse vehicles to handle an emergency situation in less than 10 seconds after commands are issued.	Performance
14	Change the data distribution mechanism from CORBA to a new emerging standard with less than six person-months' effort.	Modifiability

Scenarios should be as specific as possible

“The system shall be modifiable”

vs.

“The user interface of … is changed to different look & feel in two person days”

1. Anticipated uses of the system
   - use case scenarios
2. Anticipated changes to system
   - growth scenarios
3. Unanticipated stresses to the system.
   - exploratory scenarios

Example Use Case Scenarios

1. User changes graph layout from horizontal to vertical and graph is redrawn in one second. (performance)

2. The caching system will be switched to another processor when its processor fails, and will do so within one second. (reliability)

3. The user wants to examine budgetary and actual data under different fiscal years without re-entering project data. (usability)

Example Growth Scenarios

1. Migrate to a new operating system, or a new release of the existing operating system in less than a person-year of work.

2. Double the size of existing database tables while maintaining 1 second average retrieval time.

3. Add a new data server to reduce latency in use case Scenario 5 to 2.5 seconds within one person-week.

4. Change the Underlying Unix Platform to Macintosh

5. Add a new three dimensional map feature and a virtual reality interface for viewing the maps in less than five person months of effort

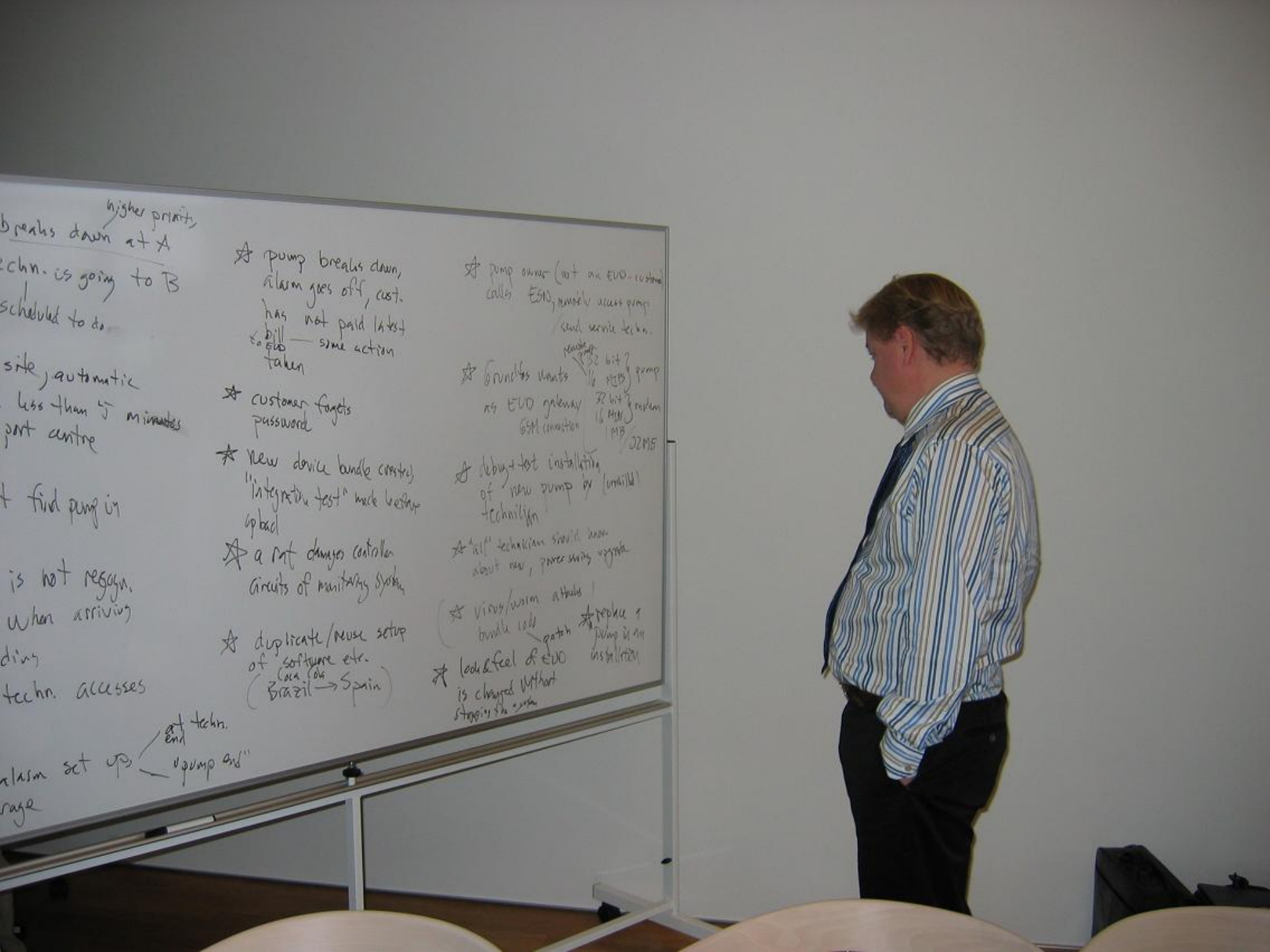
Example Exploratory Scenarios

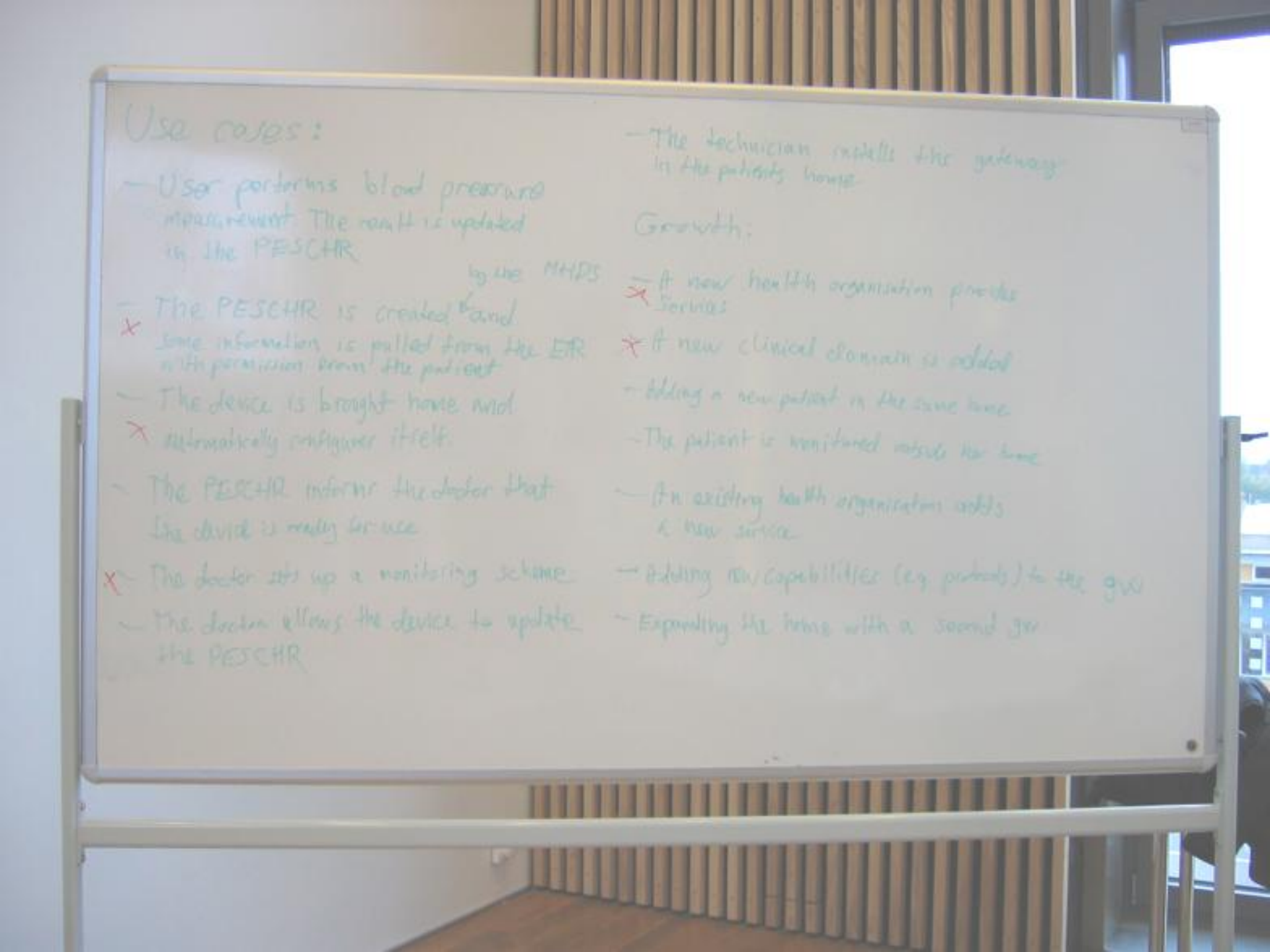
1. Tenfold increase in the number of bids processed hourly while keeping worst-case response time below 10 seconds.

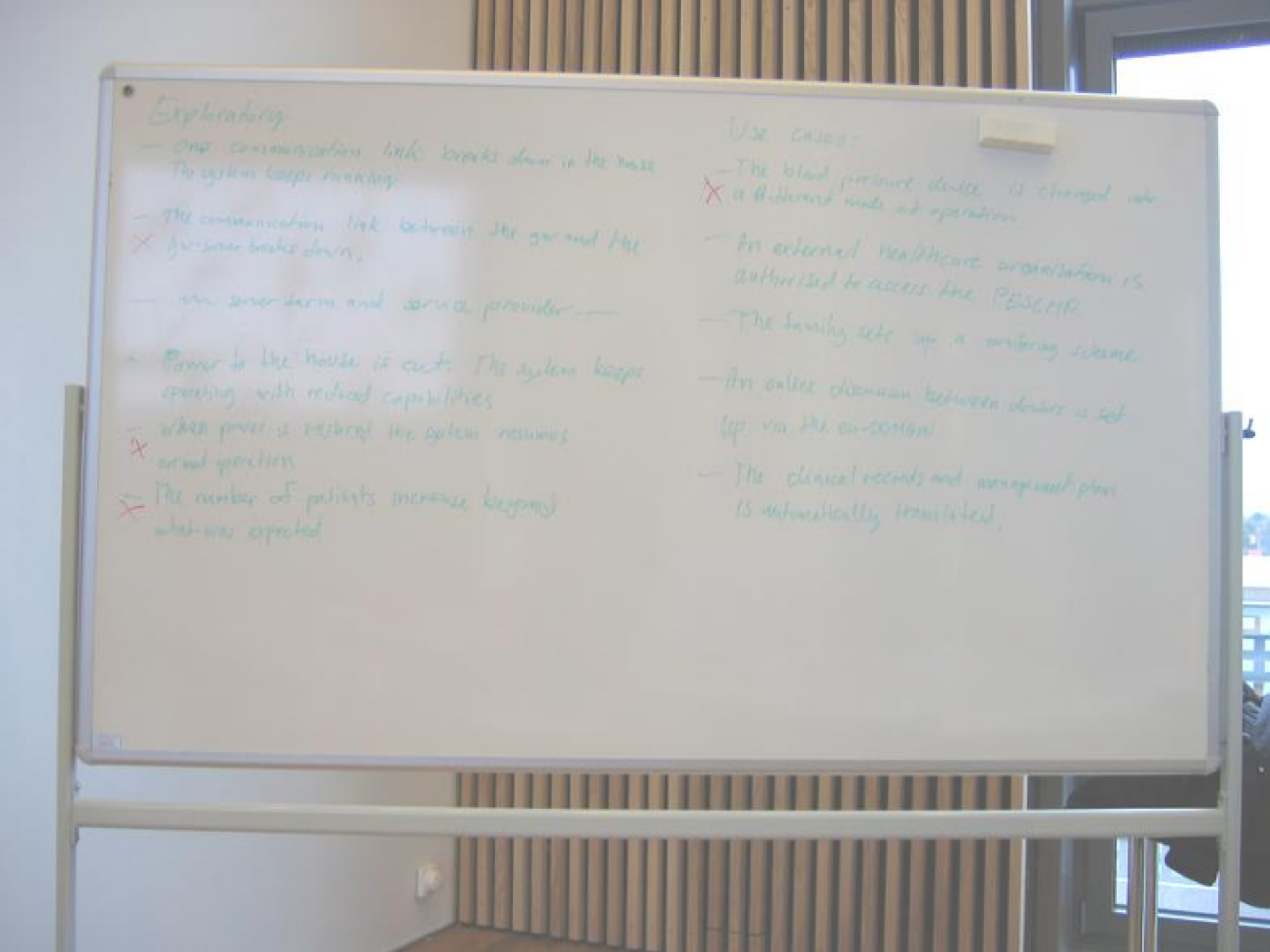
2. Change the underlying Unix platform to a Macintosh.

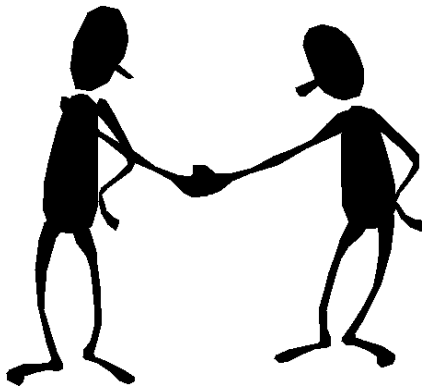
3. Improve the system's availability from 98% to 99.999%.

4. Add a new 3-D map feature, and a virtual reality interface for viewing the maps in less than five person-months of effort.

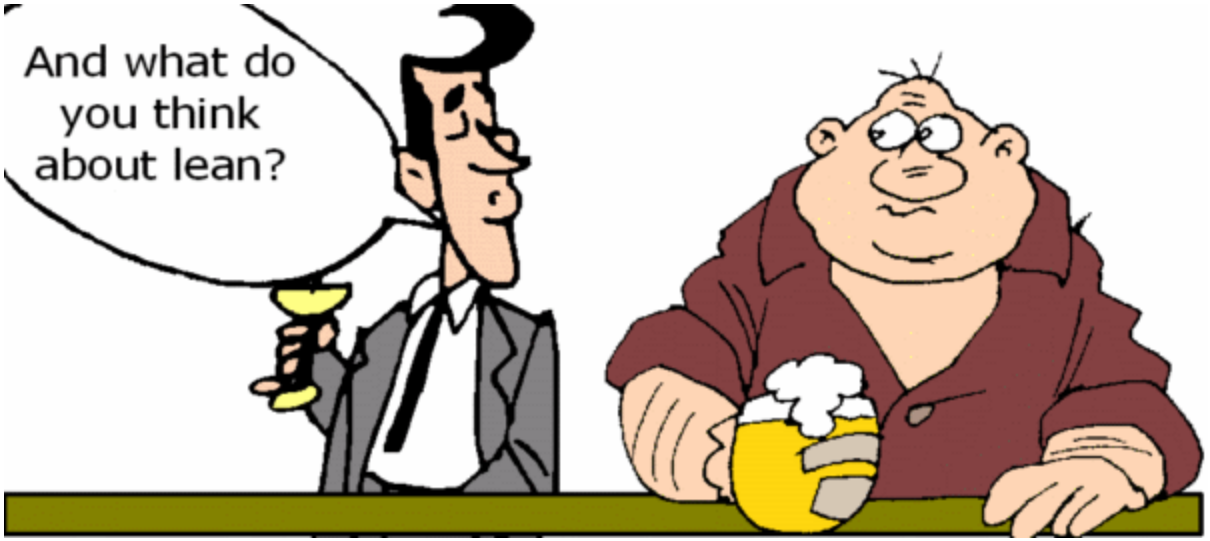

higher priority
breaks down at A
techn. is going to B
scheduled to do
site, automatic
less than 5 minutes
part centre
t find pump in
is not regogn.
when arriving
ding
techn. accesses
alarm set up
end techn.
"pump and"
rage
pump breaks down, alarm goes off, cust. has not paid latest bill — some action taken
customer forgets password
new device bundle created "integration test" made before upload
a nt changes controller circuits of monitoring system
duplicate/reuse setup of software etc. (Brazil → Spain)
pump owner (not an EVO-customer) calls EVO, remotely access pump, send service techn.
Grundfos wants pump as EVO gateway GSM connection
debug + test installation of new pump by (unskilled) technician
"all" technician should know about new, power saving upgrade
virus/worm attacks! bundle sold
look & feel of EVO is changed without
replace pump in installation


Use cases:
- User performs blood pressure measurement. The result is updated in the PESCHR by the MHDS
- The PESCHR is created and some information is pulled from the EHR with permission from the patient
- The device is brought home and automatically configures itself
- The PESCHR informs the doctor that the device is ready for use
- The doctor sets up a monitoring scheme
- The doctor allows the device to update the PESCHR
- The technician installs the gateway in the patients house
Growth:
- A new health organisation provides services
- A new clinical domain is added
- Adding a new patient in the same home
- The patient is monitored outside the home
- An existing health organisation adds a new service
- Adding new capabilities (eg protocols) to the gw
- Expanding the home with a second gw


Exploratory
Use cases:



When we compare the **quality** and **quantity** of ideas generated in group brainstorming sessions with those generated by individuals working in isolation which would be better?



According to the researchers, it’s more effective to ask team members to generate ideas individually or in pairs before a group meeting at which ideas are shared and compared.

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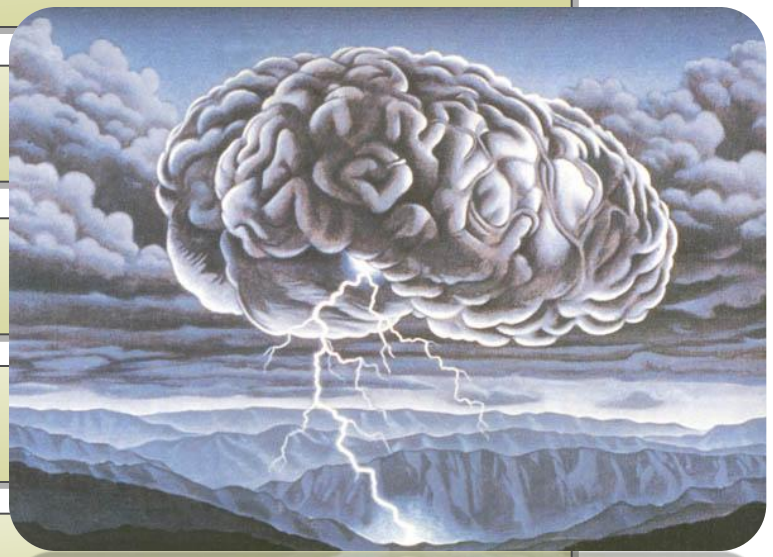

Consolidate Scenarios

Merge similar and duplicate scenarios using stakeholders' input.

Consolidation is important

Consolidation helps to prevent “dilution” of votes during the prioritization of scenarios

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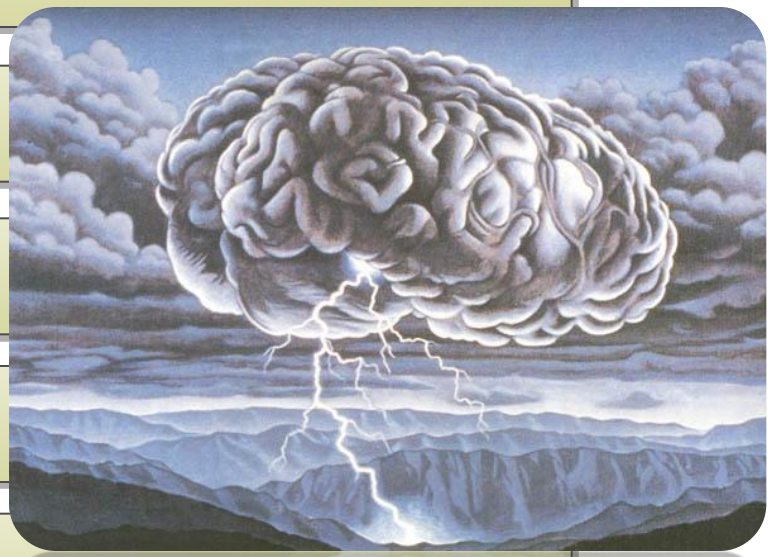
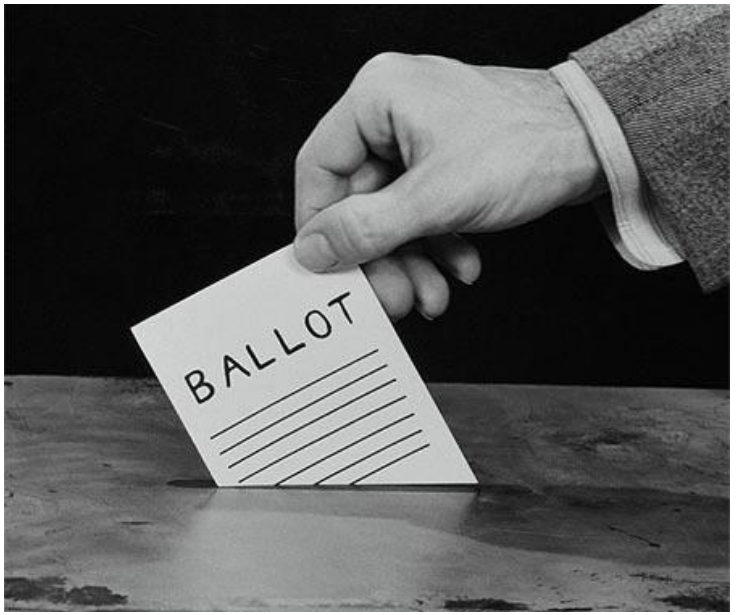


Prioritize Scenarios

Scenario	#Votes	Quality Attributes
4	28	Performance
27	26	Performance, Modifiability, Availability
10	23	Integrability
12	13	Performance
14	12	Modifiability



Each stakeholder is allocated a number of votes equal to 30% of the number of scenarios.
(for 18 scenarios 6 votes)

- Votes can be allocated in any way
  - all 6 votes allocated to 1 scenario
  - 2 votes to each of 3 scenarios
  - 1 vote to each of 6 scenarios, etc.

2 passes of Round-robin voting
Each pass allocate ½ of votes

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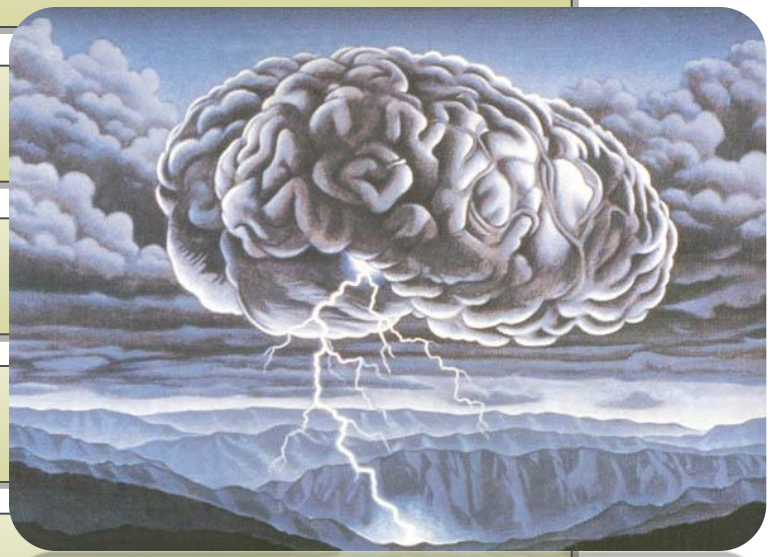

Scenario refinement

Agenda	Fully develop the high-priority scenario (4-5) to include details such as how long, how much, how often, when, environment, who, and so forth. (depending on time).
Goals	Elaborate each one, documenting six parts of the scenario 1. Stimulus 2. Response 3. Source of stimulus 4. Environment 5. Artifact stimulated 6. Response measure.

Scenario Refinement for Scenario N		
Scenario(s):		When a garage door opener senses an object in the door's path, it stops the door in less than one millisecond.
Business Goals:		safest system; feature-rich product
Relevant Quality Attributes:		safety, performance
Scenario Components	**Stimulus:**	An object is in the path of a garage door.
	Stimulus Source:	object external to system, such as a bicycle
	Environment:	The garage door is in the process of closing.
	Artifact (If Known):	system's motion sensor, motion-control software component
	Response:	The garage door stops moving.
	Response Measure:	one millisecond
Questions:		How large must an object be before it is detected by the system's sensor?
Issues:		May need to train installers to prevent malfunctions and avoid potential legal issues.

Scenario brainstorming

↓

Consolidate Scenarios
{ *Merge similar and duplicate scenarios* }

↓

Prioritize Scenarios

↓

Scenario Refinement
{ *Fully develop the high-priority scenario* }

Summary

- Goal
  - Come up with as many well-formed quality attribute scenarios as possible
  - Stimulus, response, response measure
- Stakeholders
  - Come up with quality attribute scenarios
  - At least two round-robin passes
  - No critique as such, only clarification questions
- Facilitator
  - Write scenarios on whiteboard
  - Ensure that scenarios are well-formed
- Either fixed time period or whenever participants run out of good ideas
  - Usually easy to create 20+ scenarios