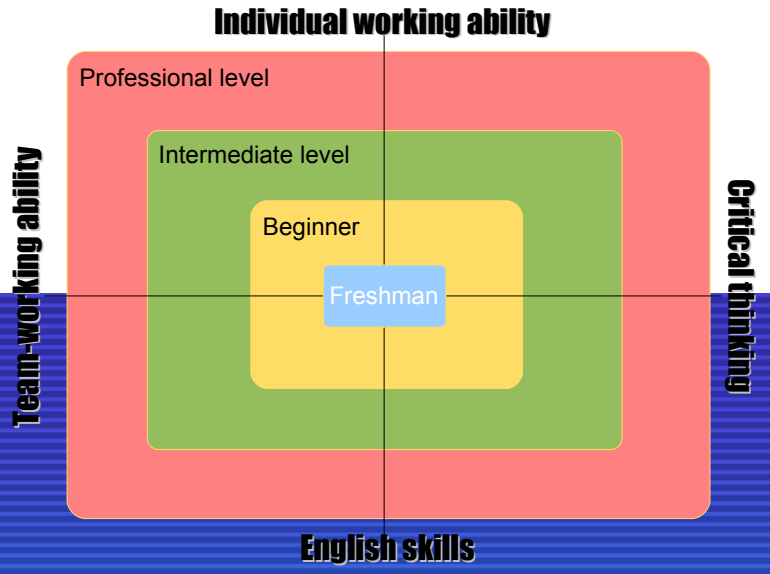
Basic Training

Essential Competences
As Design Engineers

- Beginner level -



Renesas Design Vietnam Co., Ltd.
Design Engineering Division
Mobile Software Platform Section
Vuong Cap

July 28, 2011

v01r00, Mar 13th, 2009
v02r00, Sept 16th & 17th, 2009
v03r00, Mar 23rd & 24th, 2010
v04r00, Sept 30th & Oct 11th, 2010

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Agenda - Aug. 03 AM

08:30 ~ 09:00	Objectives, expectations, agenda
09:00 ~ 09:30	Investigation methodology
09:30 ~ 09:45	Break
09:45 ~ 10:00	Communication
10:00 ~ 10:30	Making solutions - exercise
10:30 ~ 10:45	Break
10:45 ~ 11:00	Critical thinking
11:00 ~ 11:30	5why analysis - example

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Objectives & expectations

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Objective of this presentation

To give new engineers an understanding of *some essential competences* (basic level) which latter be used in engineering context as an aid to accomplish *engineering targets* and *company objectives*.

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The company objectives

Renesas Design Vietnam Co., Ltd. will

- Provide *the best quality design technology* and *innovative design methodology* for system solution business in semiconductor field.
- Contribute to activity of global design center in Renesas Group.

Accuracy

Assertion

RVC 's missions are

- Hardware/Software design of SoC
- Core competence of Renesas
- Customer satisfaction

Quality

Ambition

Innovation

Attention

Fairness

Compliance

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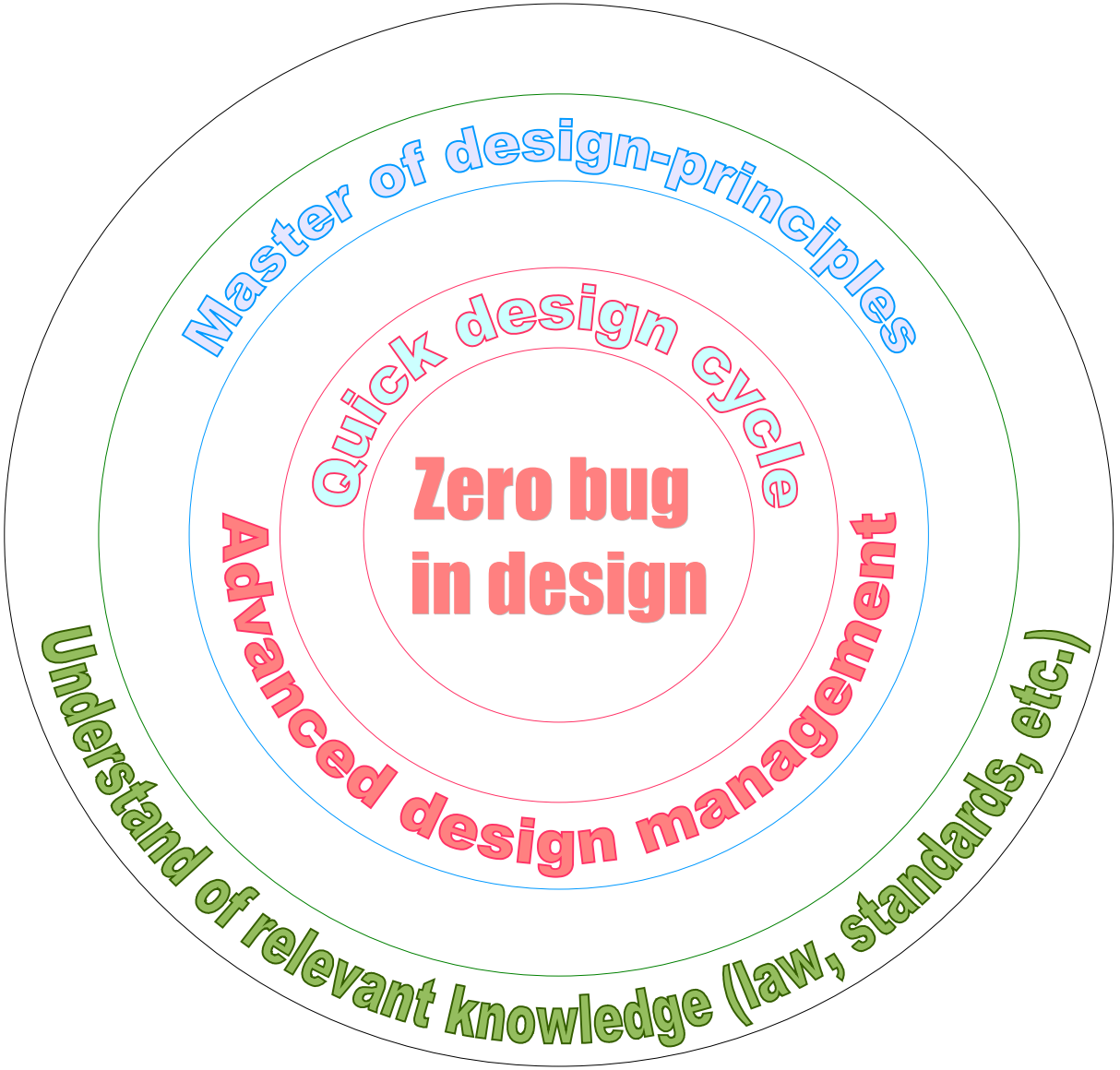
The engineering targets



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Investigation methodology

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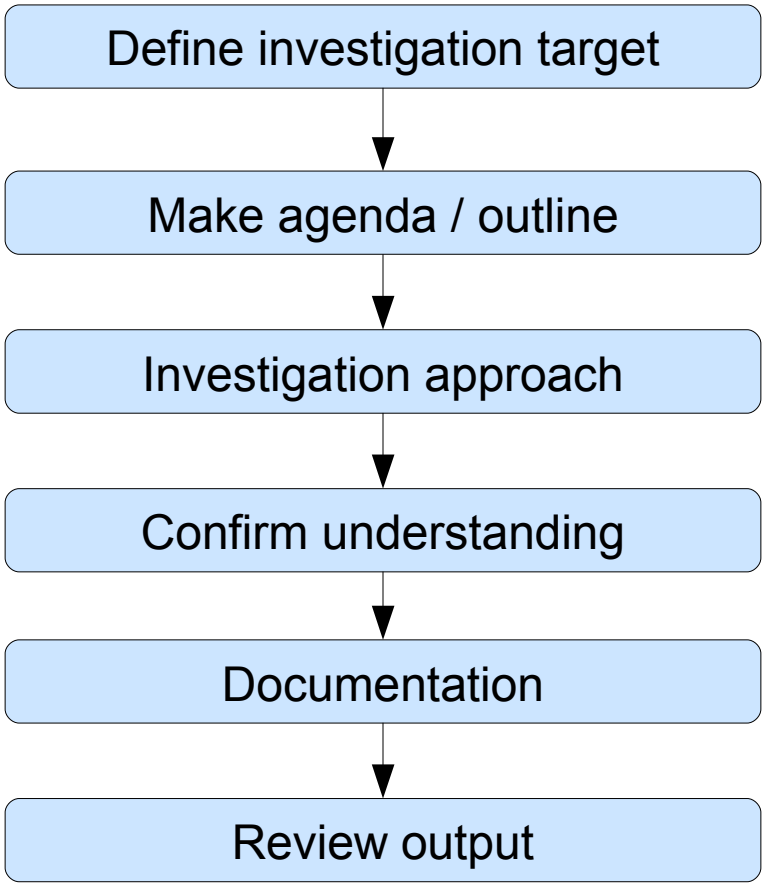
Investigation process



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Define investigation target

Make agenda / outline

Investigation approach

Confirm understanding

Documentation

Review output

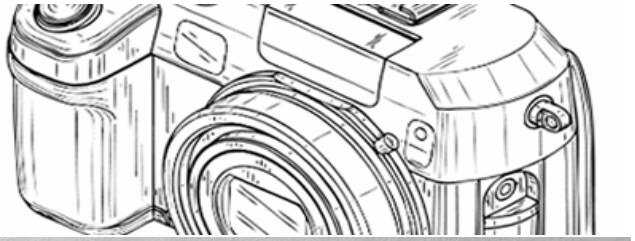
How to finish investigation within limited time?

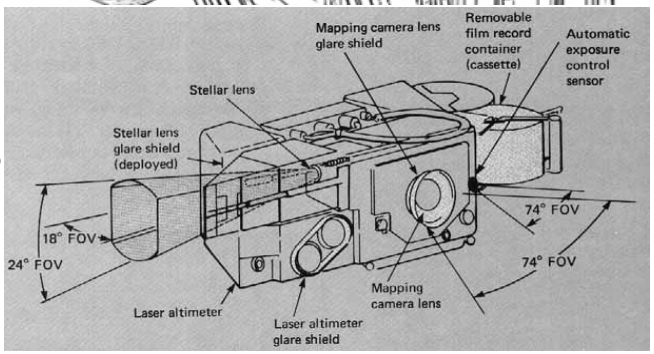
Verification purpose:

- What is its functionality?
- How to use it?

Development purpose:

- Internal structure?
- How many components?
- Relationship among components?





If you have any trouble to know what target for you to investigate, please discuss directly with leader or whom assign you the task.

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Define investigation target

Make agenda / outline

Investigation approach

Confirm understanding

Documentation

Review output

How to keep direction of investigation?

What will I investigate & what will I write?

List-up input/reference material for each item

Example:

1. Introduction
2. System architecture
3. System characteristics
4. Components intro
5. Components interface
6. Components communication
7. Detail processing of each component
8. Other resources

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Define investigation target

Make agenda / outline

Investigation approach

Confirm understanding

Documentation

Review output

How should I limit level of investigation?

- Widely first: Try to find basic information on your target

Example:

+ What's Analog-to-Digital Converter?

+ How to do this conversion?

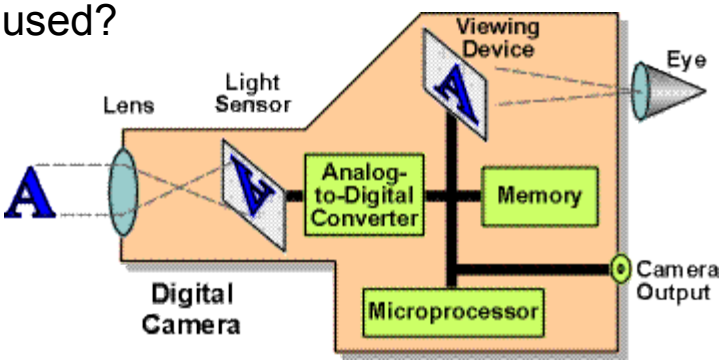
+ Where is this component in processing flow?

- Deeply later: For each item, please ask why? for what?

Example:

+ Why do we need to convert from Analog to Digital?

+ For what, “Digital” is used?



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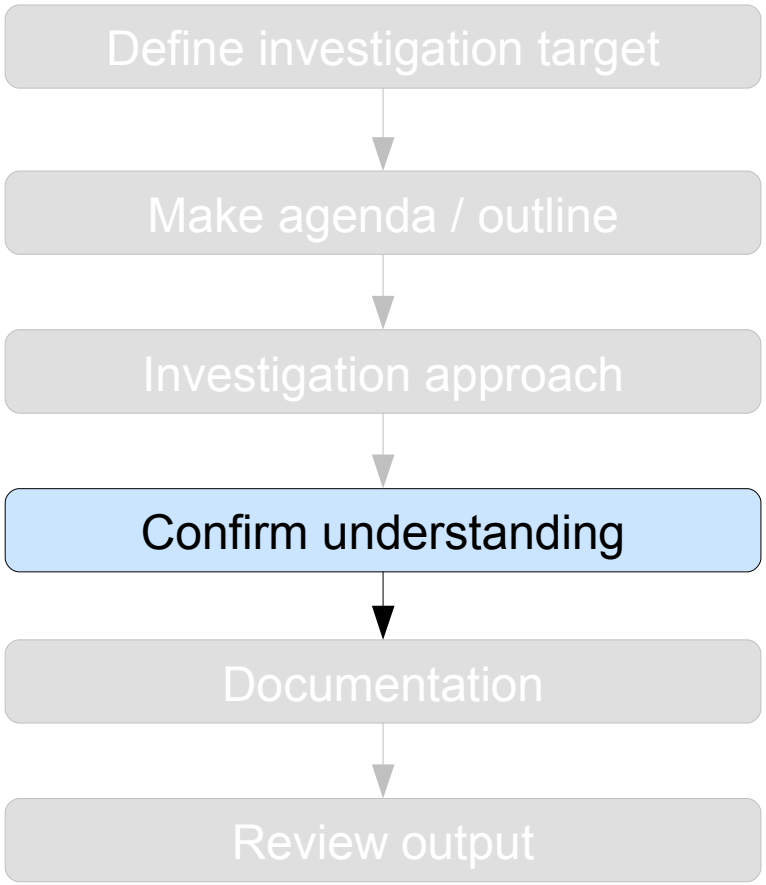

How should I know whether is it right or wrong?

Please ask, whenever completing investigation of 1 item or you have an unclear point.

Q&A style 1:

What is operation of A?

Q&A style 2:

In “doc ...” page ... the description is that: A does like B

But in “doc ...” page ... it said that: A might do like C

My understanding: in normal operation, A works like B.

But, in abnormal case, A may work like C. Is this correct?

It shows that you did investigation before asking

Please don't trust all existed doc / spec is perfect

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Define investigation target

Make agenda / outline

Investigation approach

Confirm understanding

Documentation

Review output

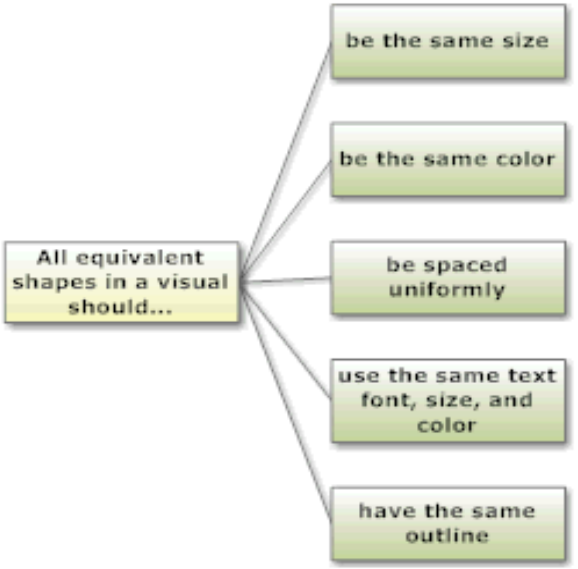
How to create good document?

- Please always give definition for not common terms because your reader is not only current colleague but also next newcomer

- Please keep consistency in your document:

  + Keep same view point will help to reduce misunderstanding

  + From experience, person who create a consistent document will make less defects in design/source code



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Define investigation target

Make agenda / outline

Investigation approach

Confirm understanding

Documentation

Review output

Do I need to review created document by myself?

YES, ALWAYS

Re-read your document after completing 1 part to:

- detect simple mistakes (format, unification, typo)

- re-think about the idea (any other solutions?)

- check under reader point of view whether there is unclear description or lack of information

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Break (15 minutes)

Communication

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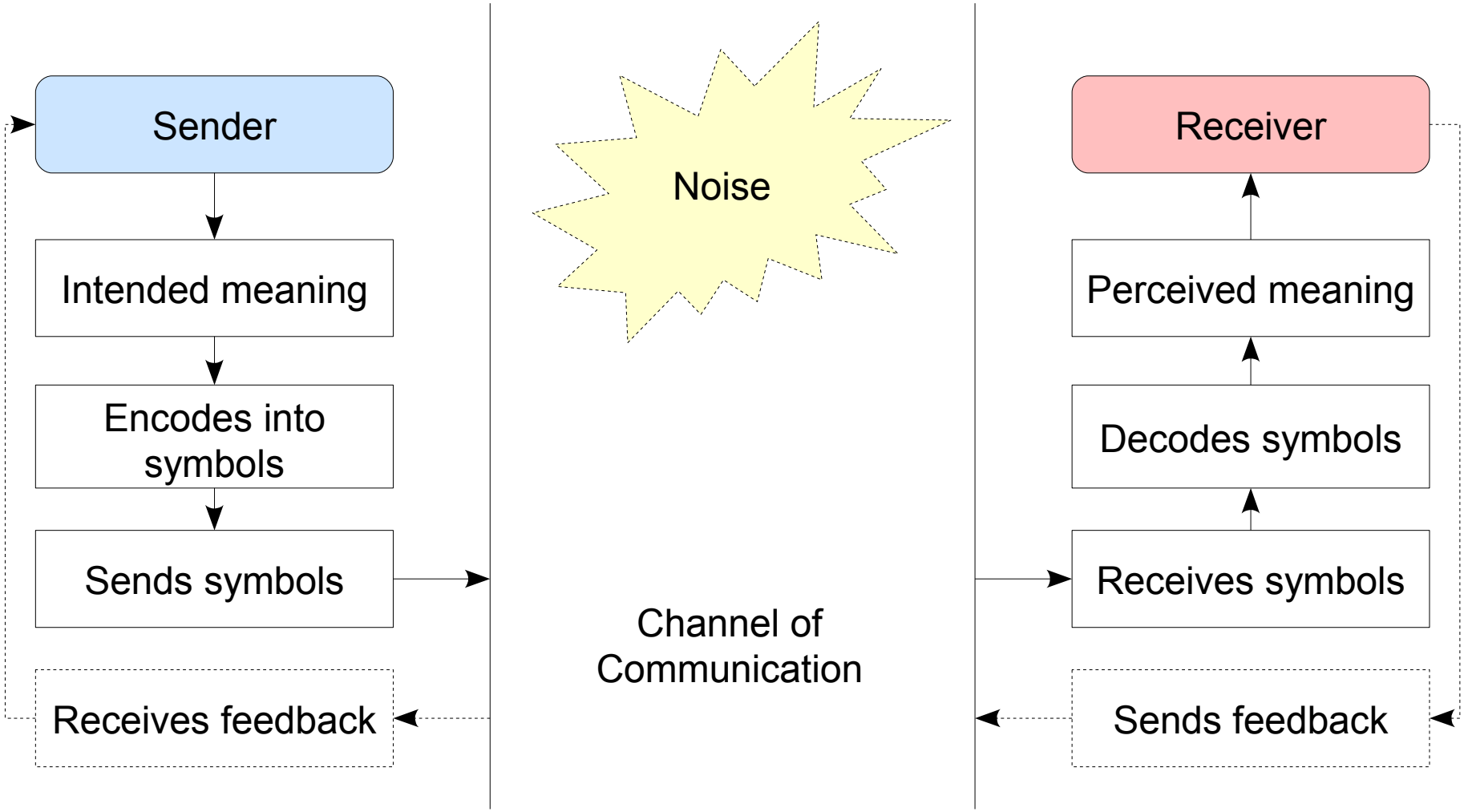
Communication process



(Source: MBA-IMC/Dr. Joe Nason, 2007)

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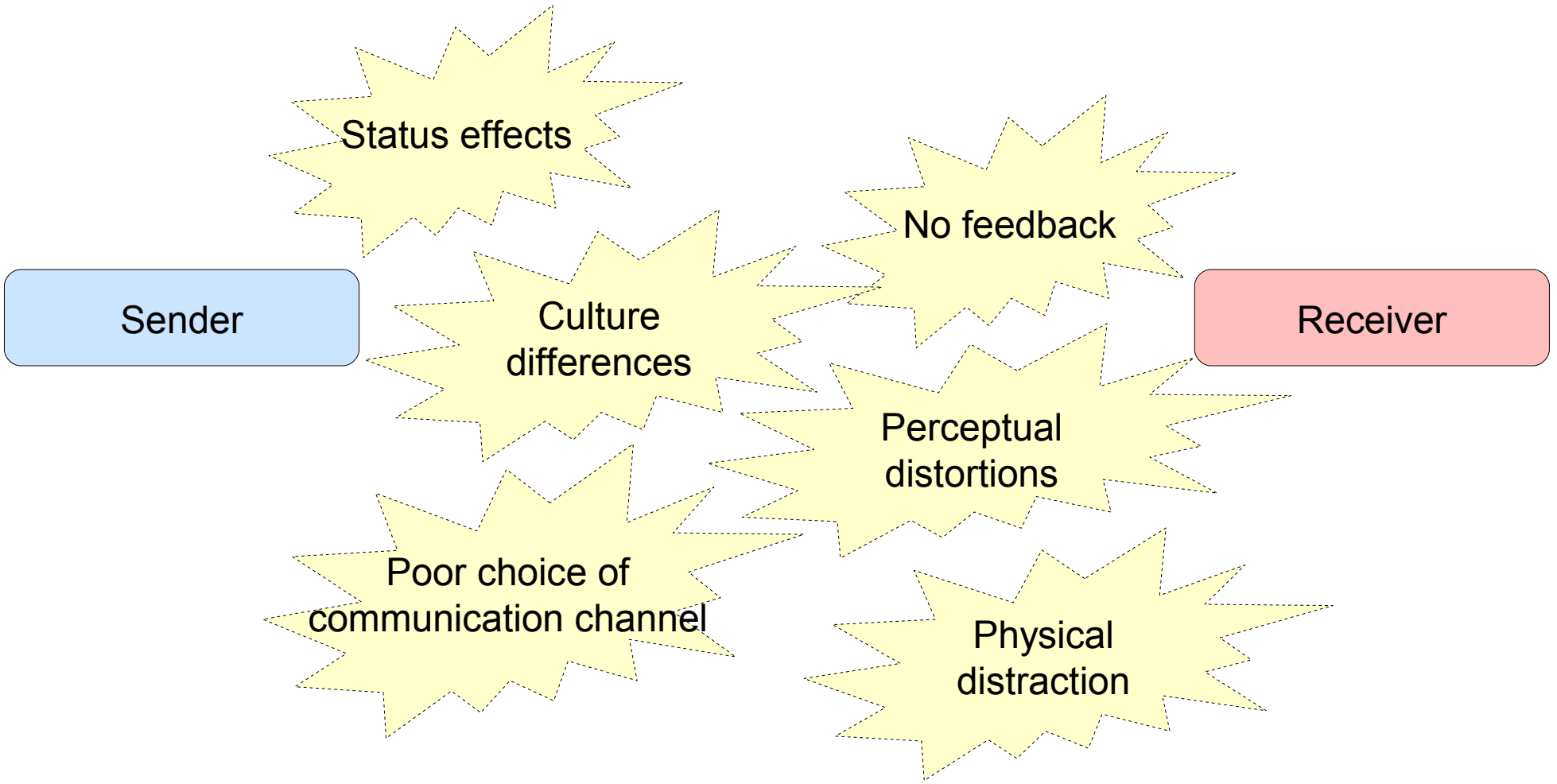
Barriers in communication



(Source: MBA-IMC/Dr. Joe Nason, 2007)

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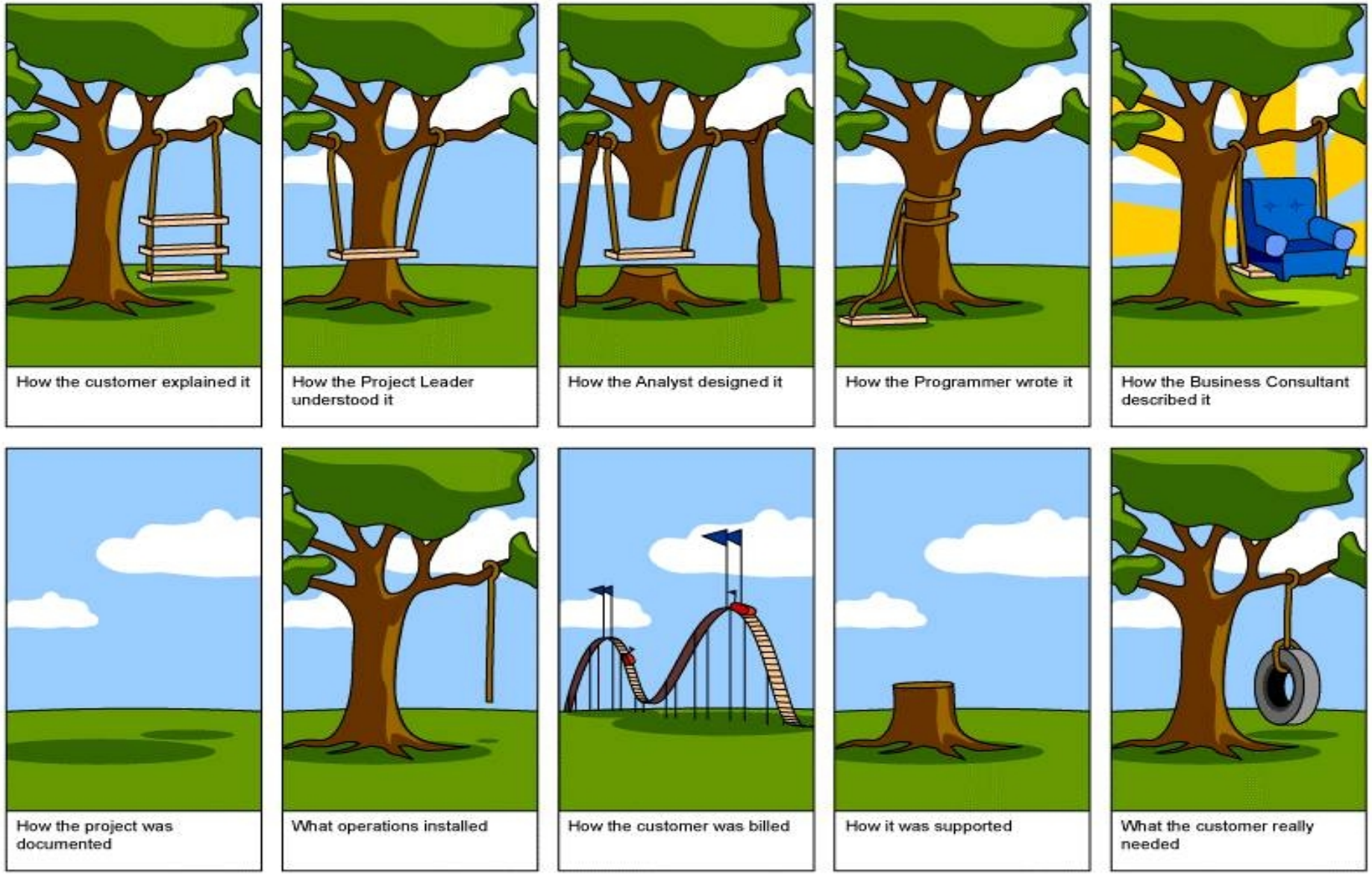
Barriers in communication - example



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Participants in meeting . . .

A. The talker

- Likes to hear their own voice
- Joins just about all topics
- Wastes time for everybody
- Drags meeting at length

"Politely make sure everyone knows that it's okay to speak about an issue, but no one likes unnecessarily long meeting"

Source: Kissey/Sabah 2001

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B. The belligerent

- Just doesn't agree with anyone
- "Explaining" means yelling & scream
- Puts everyone on the defensive
- Not willing to listen
- Not willing to compromise

"Let him/her be the chairperson or tell him/her firmly of the poor behavior".

Source: Kissey/Sabah 2001

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C. The sleeper

- Goes to zzz….ZZZZZZ
- Suddenly joins midway
- Makes “nosy noise”

“Talk with the sleeper to stay awake in future or station somebody near him/her”

Source: Kissey/Sabah 2001

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D. The interrupter

- Always jumps in conversation
- Can't wait his/her turn to speak
- Always his/her interruption is irrelevant

"Discuss, suggest, nice, and un-embarrassing ways that you can help overcome his/her personality trait".

Source: Kissey/Sabah 2001

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E. The wanderer/sideliner

- Goes “Off on a tangent”
- Takes everyone to his trip

“It’s best to take this discussion later perhaps during coffee break or handle it off-line”

Source: Kissey/Sabah 2001

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F. The back-sitter

- Wants to escape
- Not interested in the meeting
- Will start own meeting at the back

"Don't let him/her join in the next meeting Or Ask him/her opinion on any juncture".

Source: Kissey/Sabah 2001

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Effective communication in meeting

1. Define the purpose of communication
2. Limit the extent of communication
3. Ensure the right people are there
4. Get the right number of people
5. Facilitate introductions
6. Be active
7. Be rational but open-minded
8. Be brief, be simple and be organised
9. Make good use of non-verbal communication
10. Stay calm and don't argue
11. Avoid personal attacks
12. Bring the communication to a conclusion.

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Making solutions

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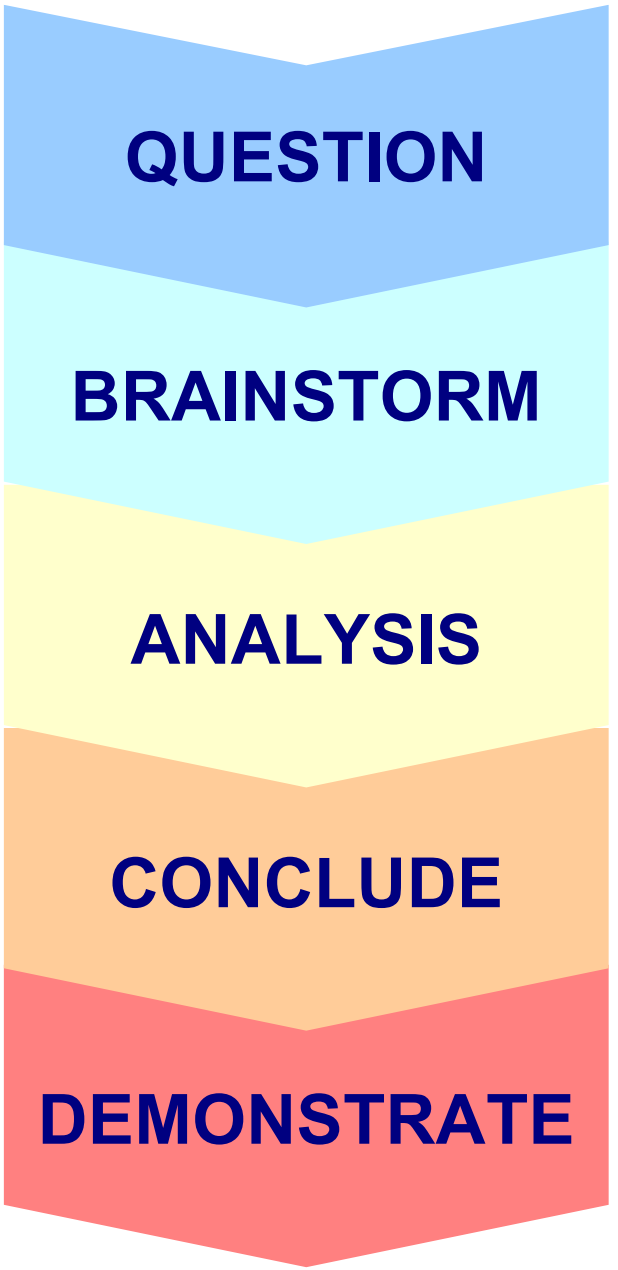
Solution = Idea(s) + Analysis

Making solutions

within 05 steps ...



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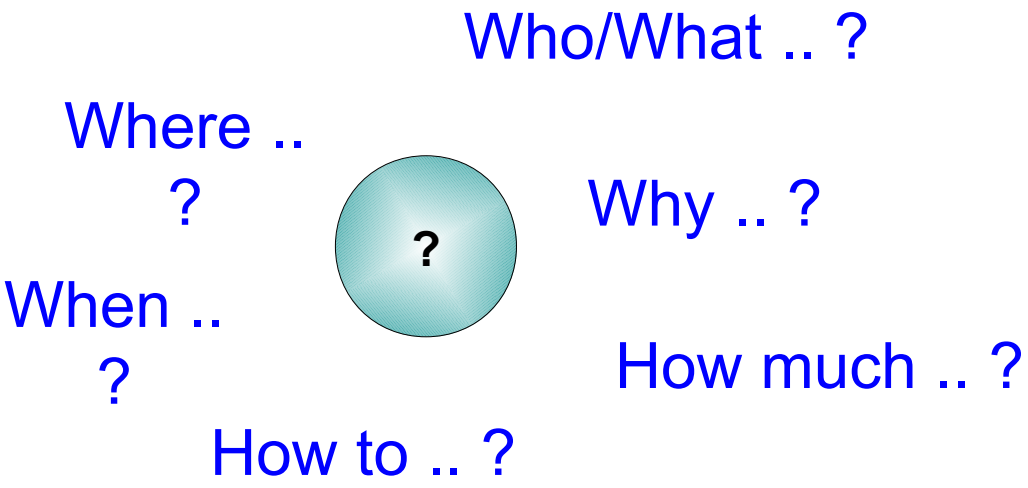
Step 1: asking a right question.



<u>Note:</u> The question should be specific and short enough.
If it's long or complex, break it down to several smaller questions.

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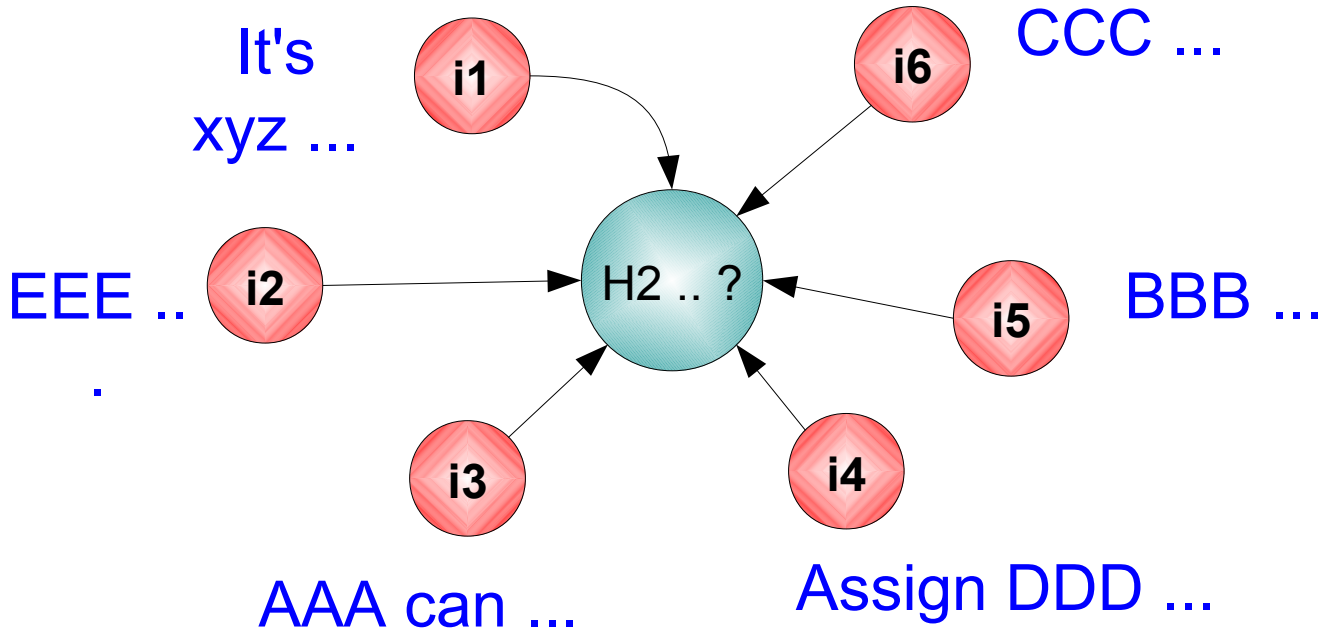
Step 2: brainstorming ideas.



Rules: #1. No judgement. i.e. there's neither wrong idea, nor right idea.

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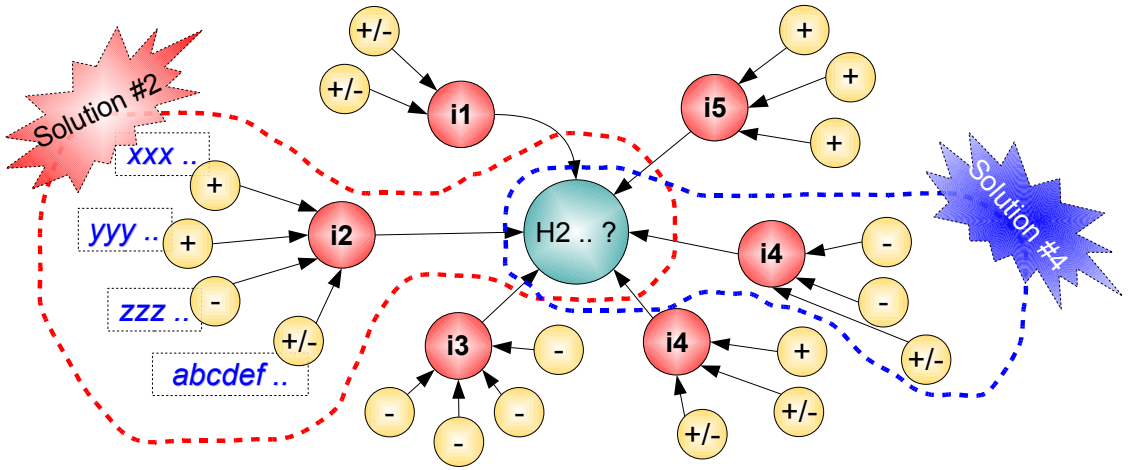
Step 3: strength/weakness analysing.



(Q1) "H2 ...?"	(i1) "It's xzy .."	(i2) "EEE .."	(i3) ".."	(i4) ".."	(i5) ".."	(i6) ".."
(+)						
(-)						
(+/-)						

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QUESTION
BRAINSTORM
ANALYSIS
CONCLUDE
DEMONSTRATE

Step 4: choosing suitable solution.

(Q1) "H2 ...?"	(i1) "It's xzy .."	(i2) "EEE .."	(i3) ".."	(i4) ".."	(i5) ".."	(i6) ".."
(+)						
(-)						
(+/-)						
Opportunities						
Threats/Risks						
Priority	2	4	1	6	5	3
Conclusion	(backup)	(backup)	Chosen	(backup)	(backup)	(backup)

Not must, but helpful to make conclusion

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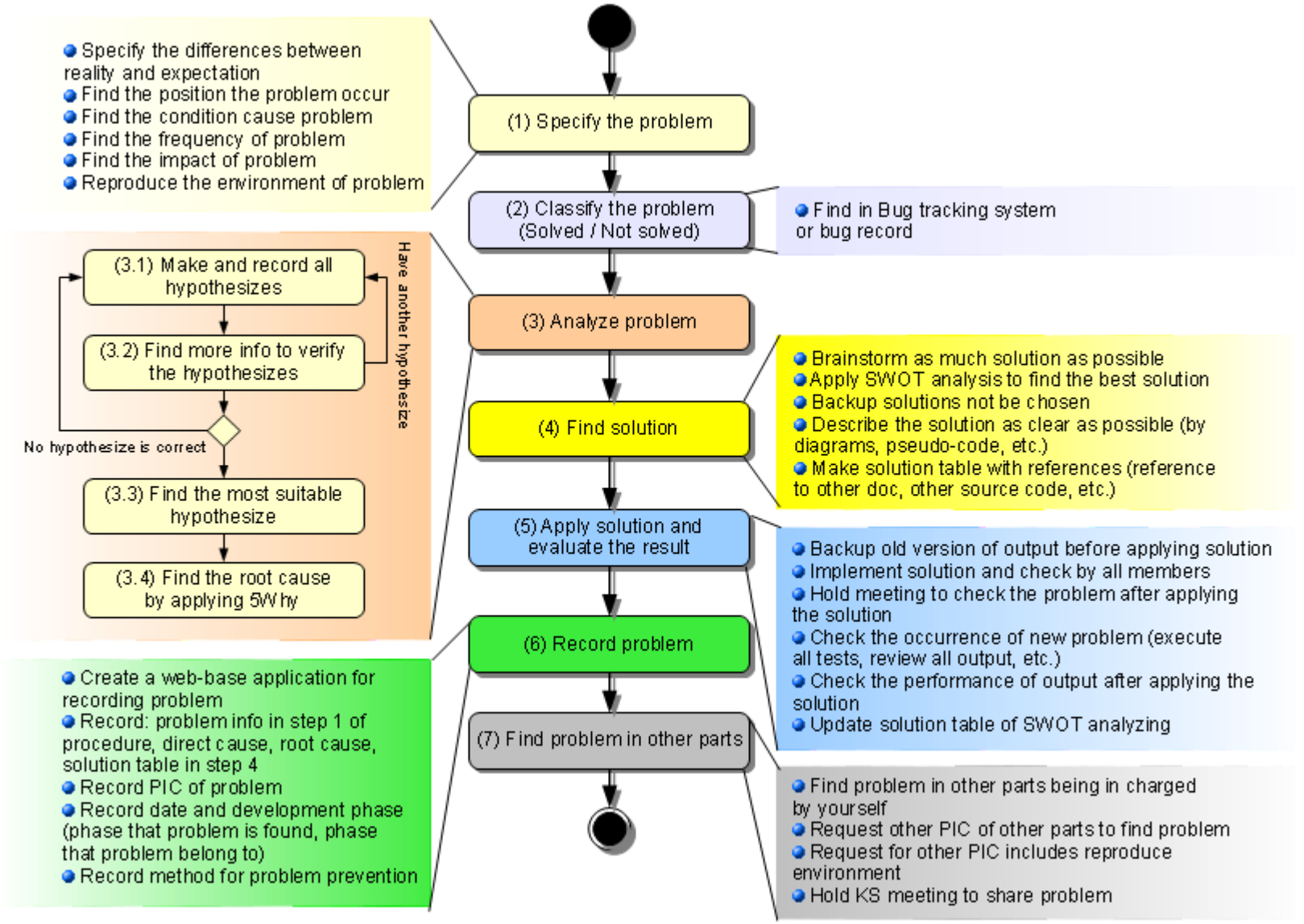
Step 5: demonstrate the conclusion



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Break (15 minutes)

Critical thinking

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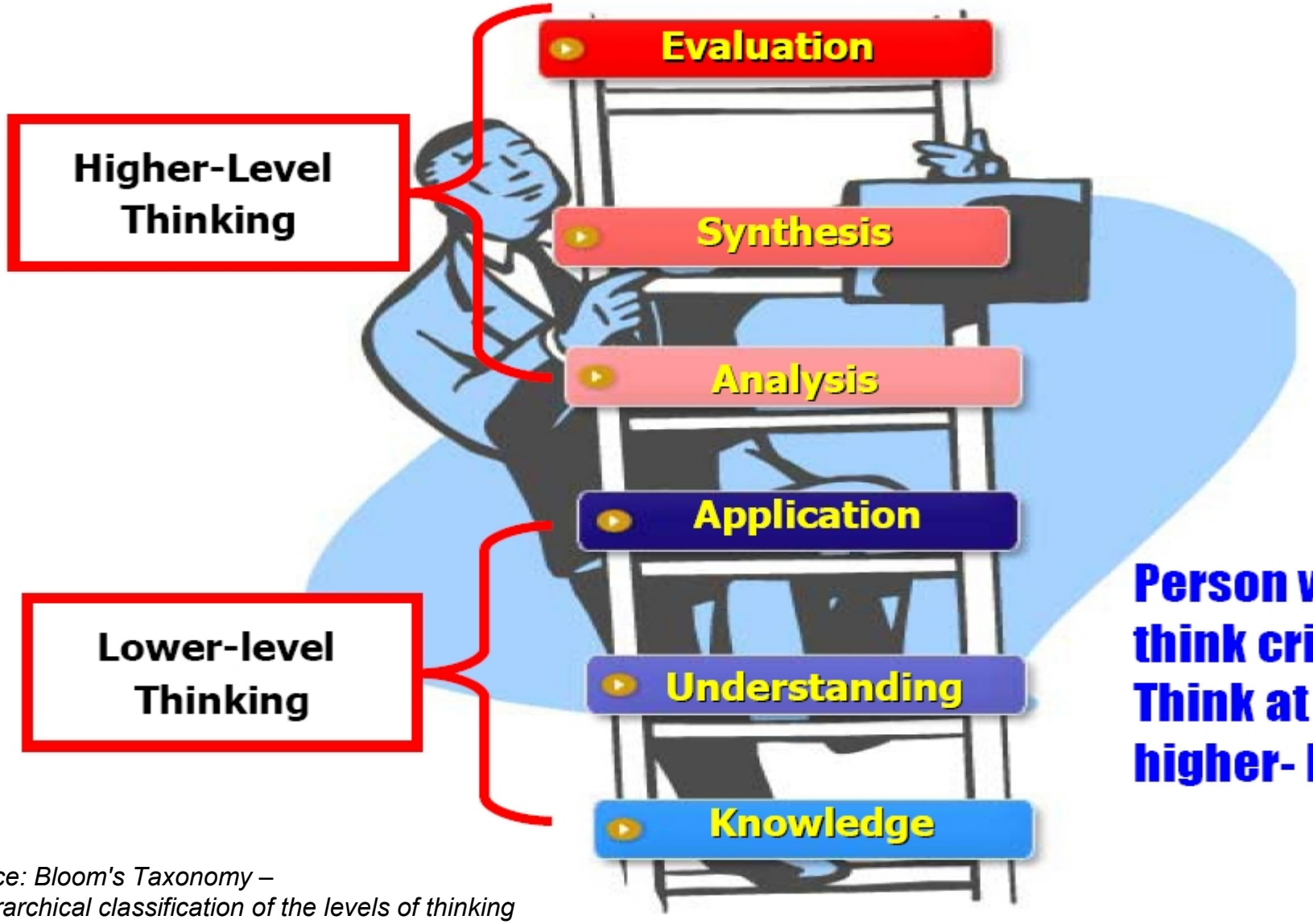
Critical thinking



Person who think critically: Think at higher- level

Source: Bloom's Taxonomy –
a hierarchical classification of the levels of thinking

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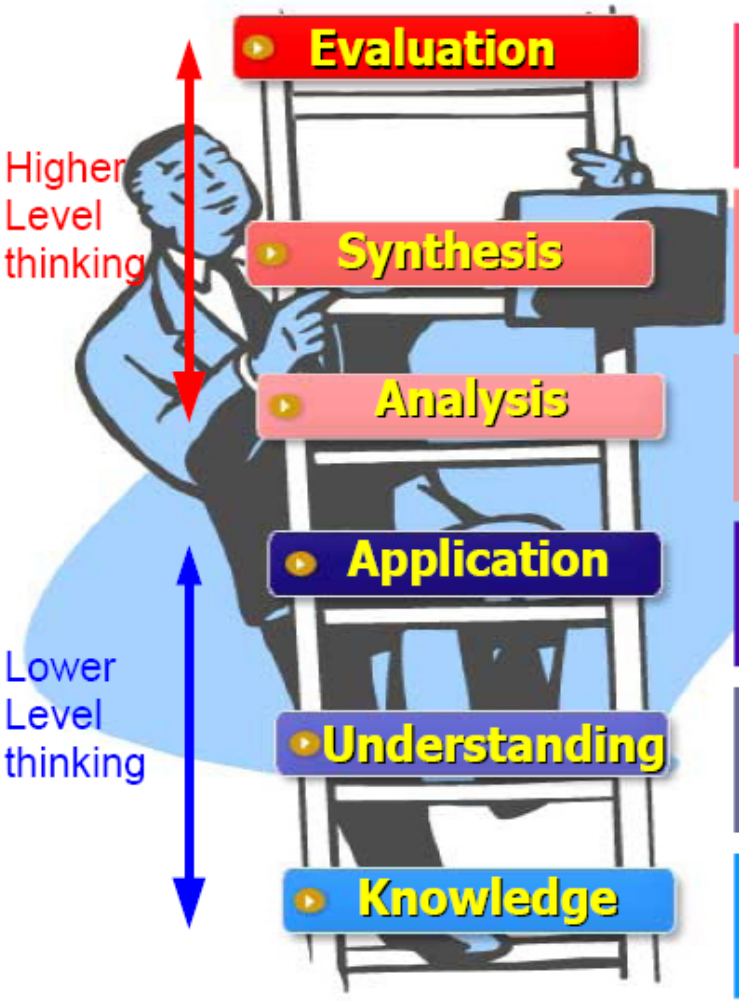

Make judgments and decisions by determining the reliability of things.

Combine ideas and come to a conclusion

Break the entire process into parts, understand the relation of these parts to the whole

Take knowledge learnt in one situation and apply to another situation

Seek to select and organize facts and ideas, discovering the relationships between them.

Seek to determine the basic information of a situation

Source: Bloom's Taxonomy –
a hierarchical classification of the levels of thinking

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“Critical thinking is the disciplined mental activity

of evaluating arguments

or propositions and making judgments

that can guide the development of beliefs

and taking action”

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Critical thinking in solving engineering problem is a chain of following activities:

- Detect the problem
  - Solve the problem
    - Forecast the future
      - Prevent similar problem in future

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5why analysis

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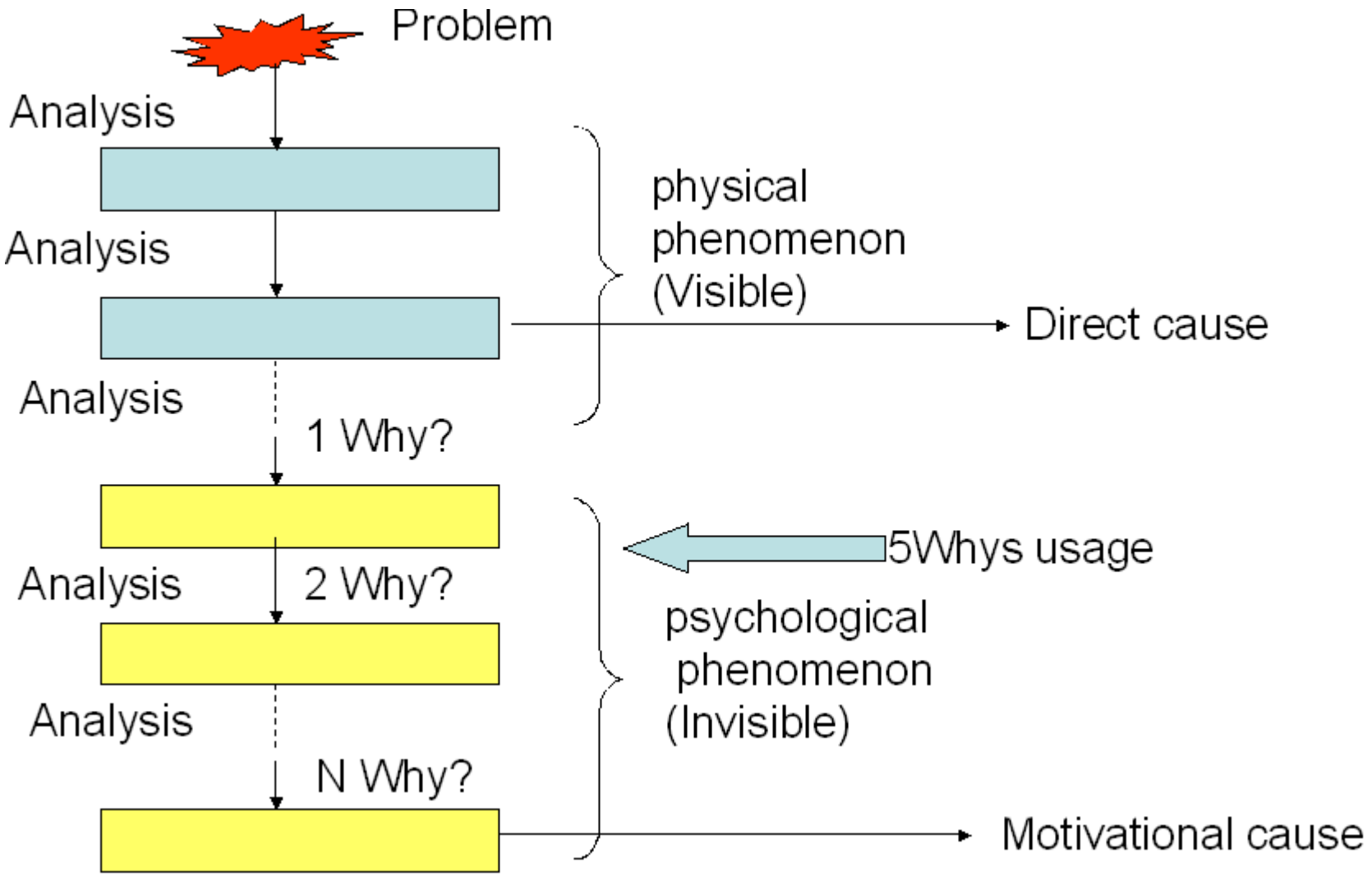
Critical thinking tool - 5why analysis



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Exercise 1

Divide 4 groups and select 1 leader/group
- Leader send "topic" registration by Aug 4
- Create 5why analysis presentation by Aug 8

On Aug 10 AM:
+ Presentation: 10 minutes
+ Q&A: 10 minutes

End of today.
Thank you for your cooperation.

Agenda - Aug.10 AM

08:30 ~ 08:50	5why analysis report (Group 1)
08:50 ~ 09:10	5why analysis report (Group 2)
09:10 ~ 09:25	Break
09:25 ~ 09:45	5why analysis report (Group 3)
09:45 ~ 10:05	5why analysis report (Group 4)
10:05 ~ 10:20	Break
10:20 ~ 10:35	PDCA cycles, making a report
10:35 ~ 11:15	Schedule your works (TPM tool intro)

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PCDA cycles, making a report

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PDCA cycle

PDCA is a continuous improvement tool.

Plan

Investigate
Clarify objectives
Identify possible causes
Benchmark best practice
Identify team roles
Implement quick fix

Do

Implement
Carry out trial to prove causes
Analyze data to understand how problem occurs
Identify possible solutions

Check

Evaluate & Validate
Pilot study solution to verity data
Countermeasure
Training
Communication

Act

Correct & Standardize
Review feedbacks & Make corrections
Standardize Do, Check, Act

Customer satisfaction

(Source: NSK-RHP/S D Bellamy, 2000)

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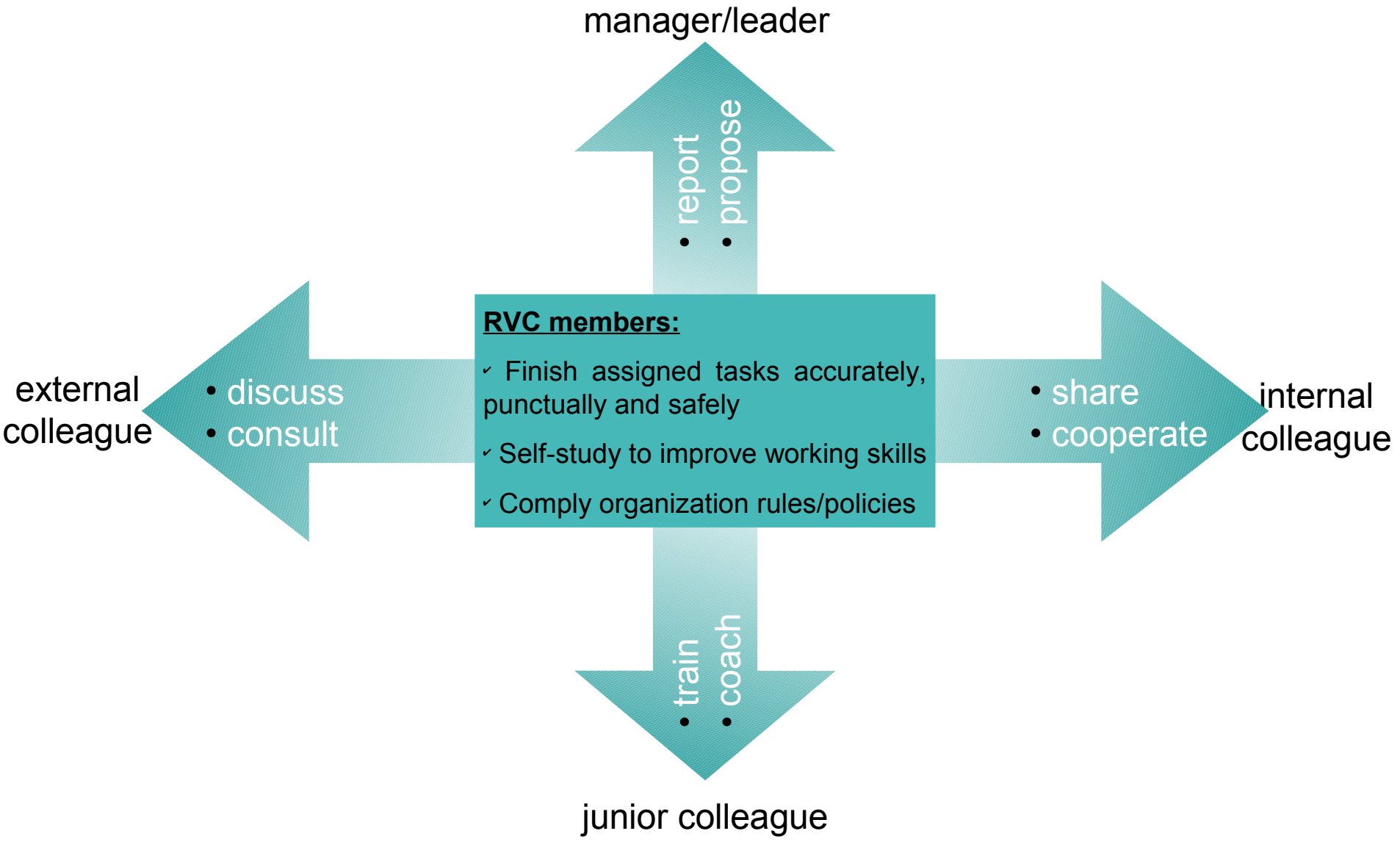
RVC team-work



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Making a report

“ Writing weekly report is an activity to look back on one week and think what is good/bad, what is needed to improve if bad. ”

(Atsushi Hiraoka - RT/PFKaise)

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Issues when making a report

- **Unclear target recipients**
- **Unclear task assignment (**Output, Work-speed, Manpower, Duration**)**
- **Tend to keep schedules on-time (**focus only to progress/process**)**
- **Tend to report without comments (**lack of active thinking**)**
- **Too much waste infos, too few needful issues**
- **Passive reacts for report comments by others**
- **Issues are easily vanished without confirmations**
- **Big issues cause big impacts are usually reported lately**
- **Root causes are not pointed out**

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Schedule your works

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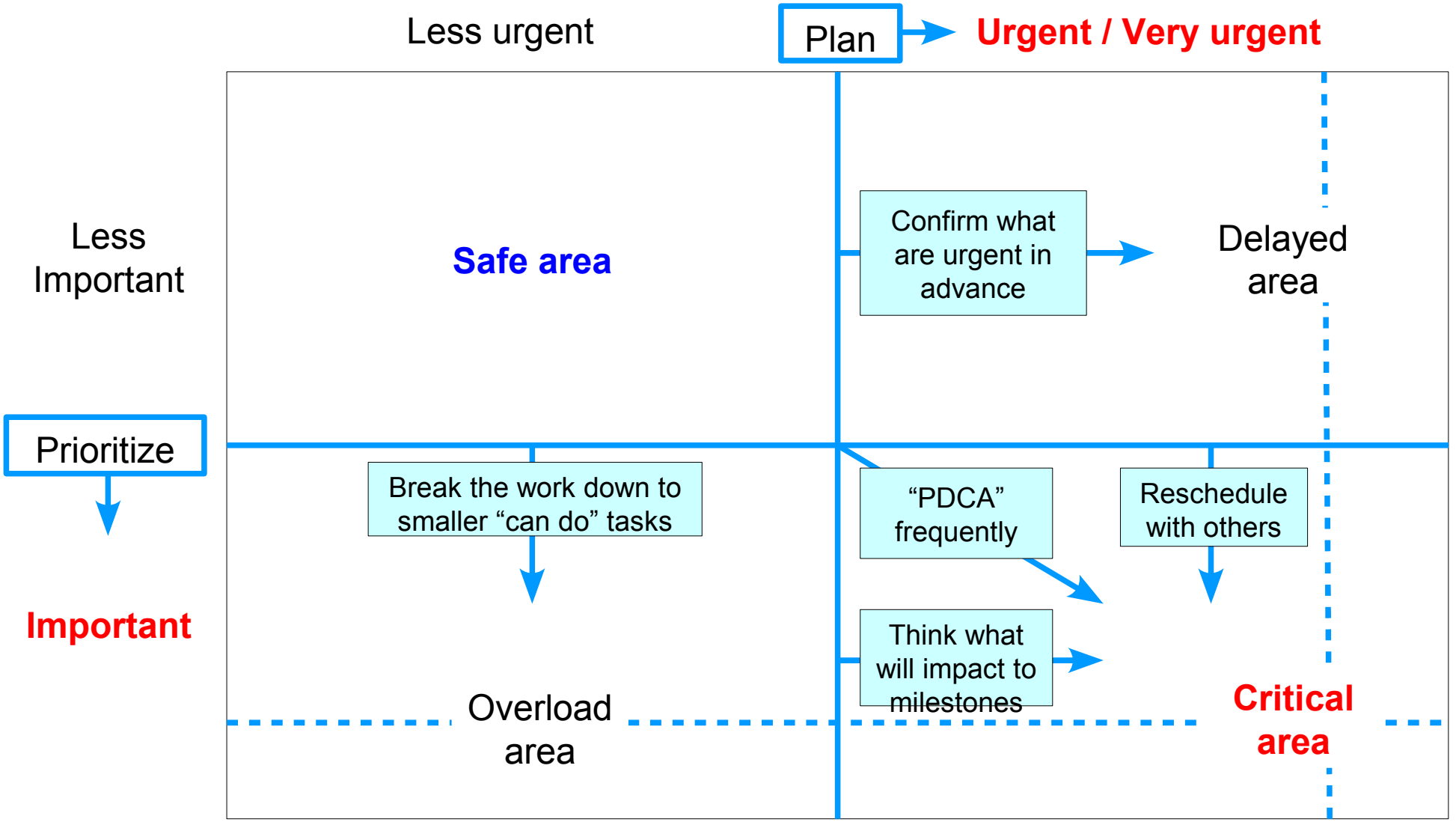
The "schedule" window



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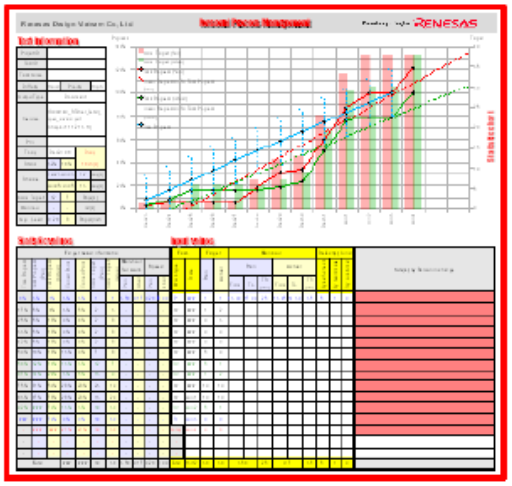
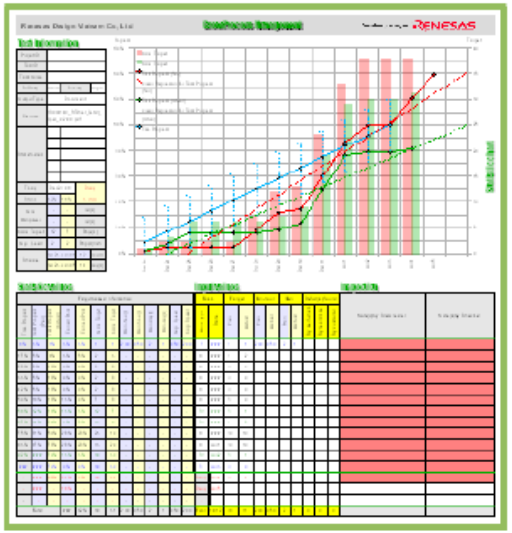
Schedule your works - TPM tool

TPM for Personal Process Mgmt



TPM for Crew Process Mgmt



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Exercise 2

Make daily working plan for yourself as a new engineer in internship period. And send it to your supporters and me <vuong.cap.xm@rvc.renesas.com>

Let's build tomorrow products together!

Renesas Design Vietnam Co., Ltd.

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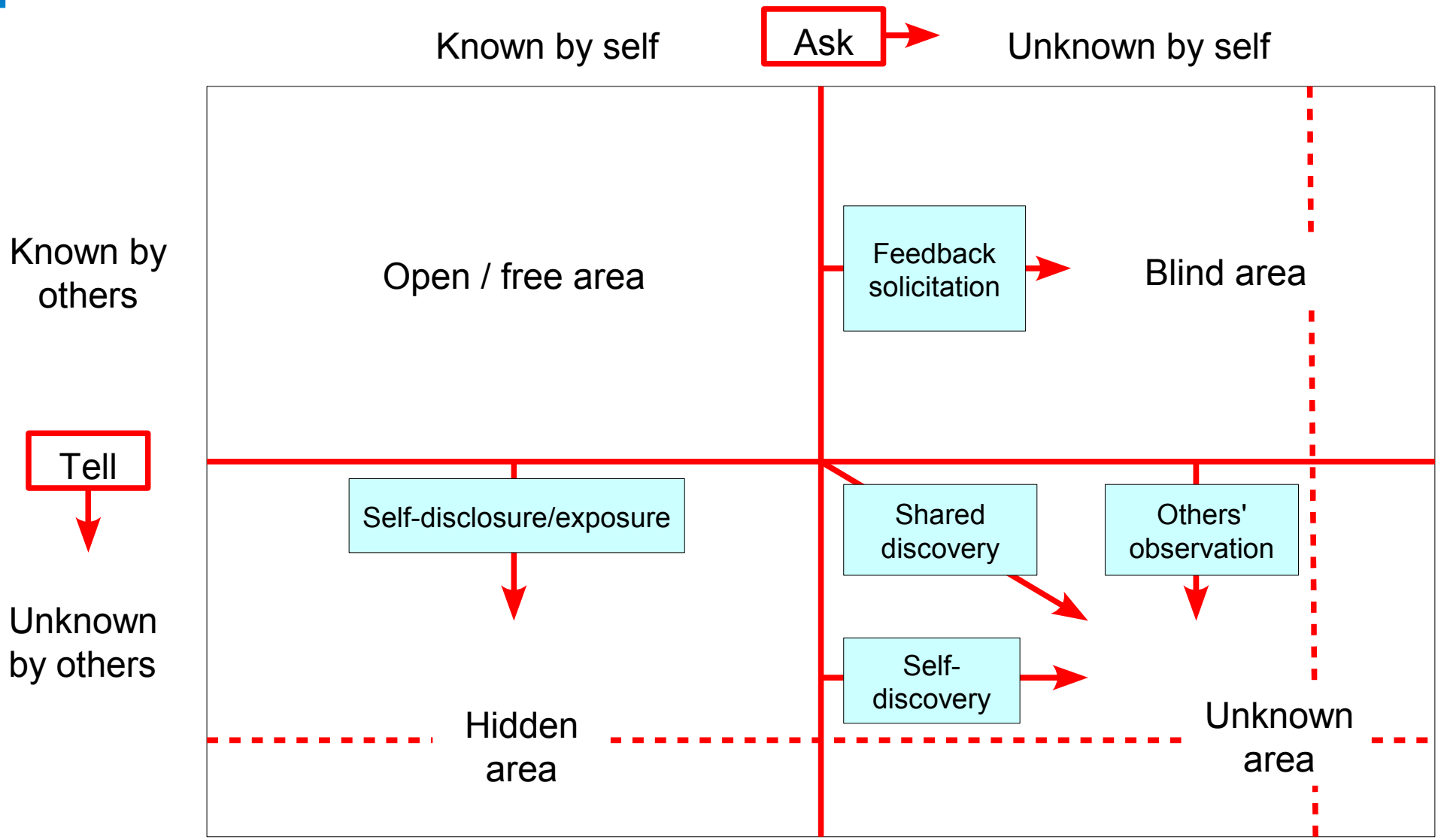
The Johari window



(Source: MBA-IMC/Dr. Joe Nason, 2007)

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Making a report

Ask yourselves ...

Why do you need to report ?

Who will read your reports ?

What are valuable in the reports ?

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