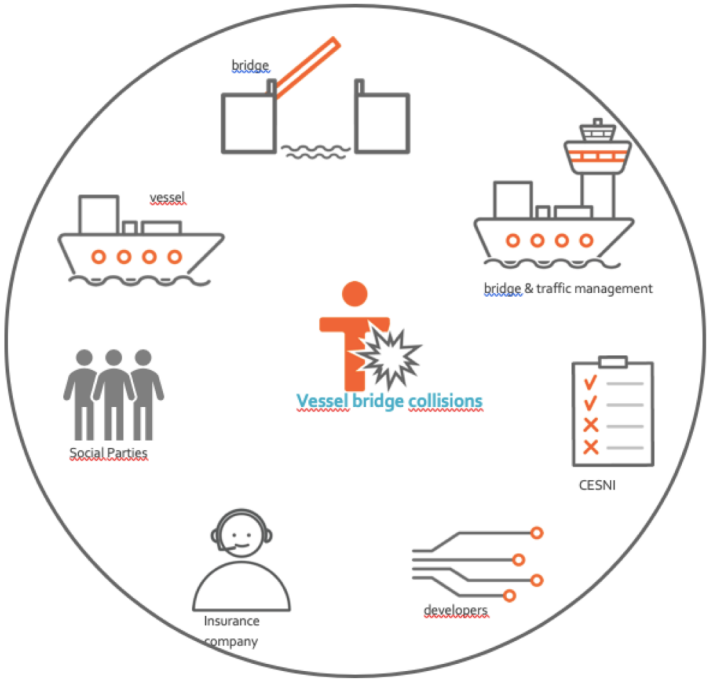

The human factor

Vessel bridge collisions

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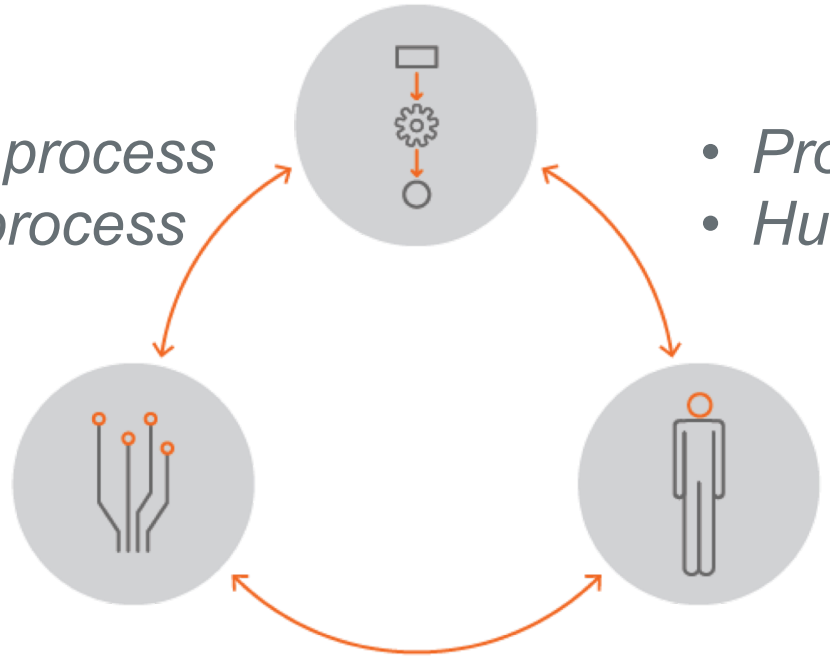
Illustration – test your awareness “who dunnit” (youtube)

Never forget + = human factors/ ergonomics

Organization
- Tasks
- Procedures
- Collaboration

- *Technology represents process*
- *Technology optimizes process*



- *Process fit for human*
- *Human knows process*

Technology
- Process support
- User support

Human
- Competences
- Skills
- Workload
- Human reliability

- *Technology assists human*
- *Human knows how to use technology*

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1. Memory

Humans:
Make use of different types of memory influencing our perception, behaviour,
This is affecting system performance

A	G	V
P	W	S
L	R	U

What exactly for should there be an alarm, or better a warning ?

What should alarm be like ?

How many alarms are acceptable ?

Cross over from other sectors possible

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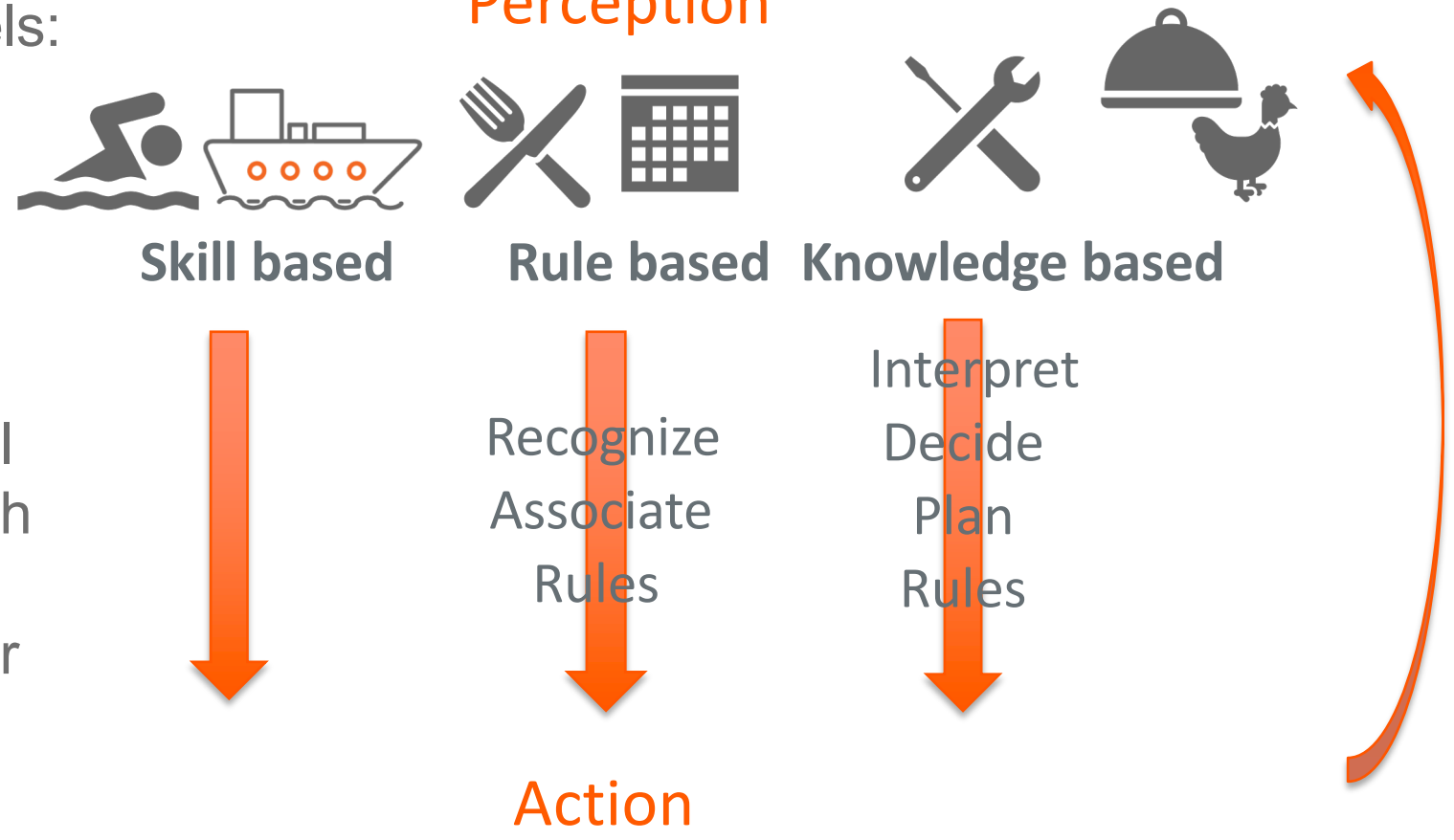
2. Level of attention

ROOD GROEN BLAUW GEEL

Navigation levels:
- Operational
- Tactical
- Strategic

Tendency to skill based level so readily switch to other tasks while not proper Risk for other situations



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3. Situation awareness

What you see
and understand
is influenced by
expectation

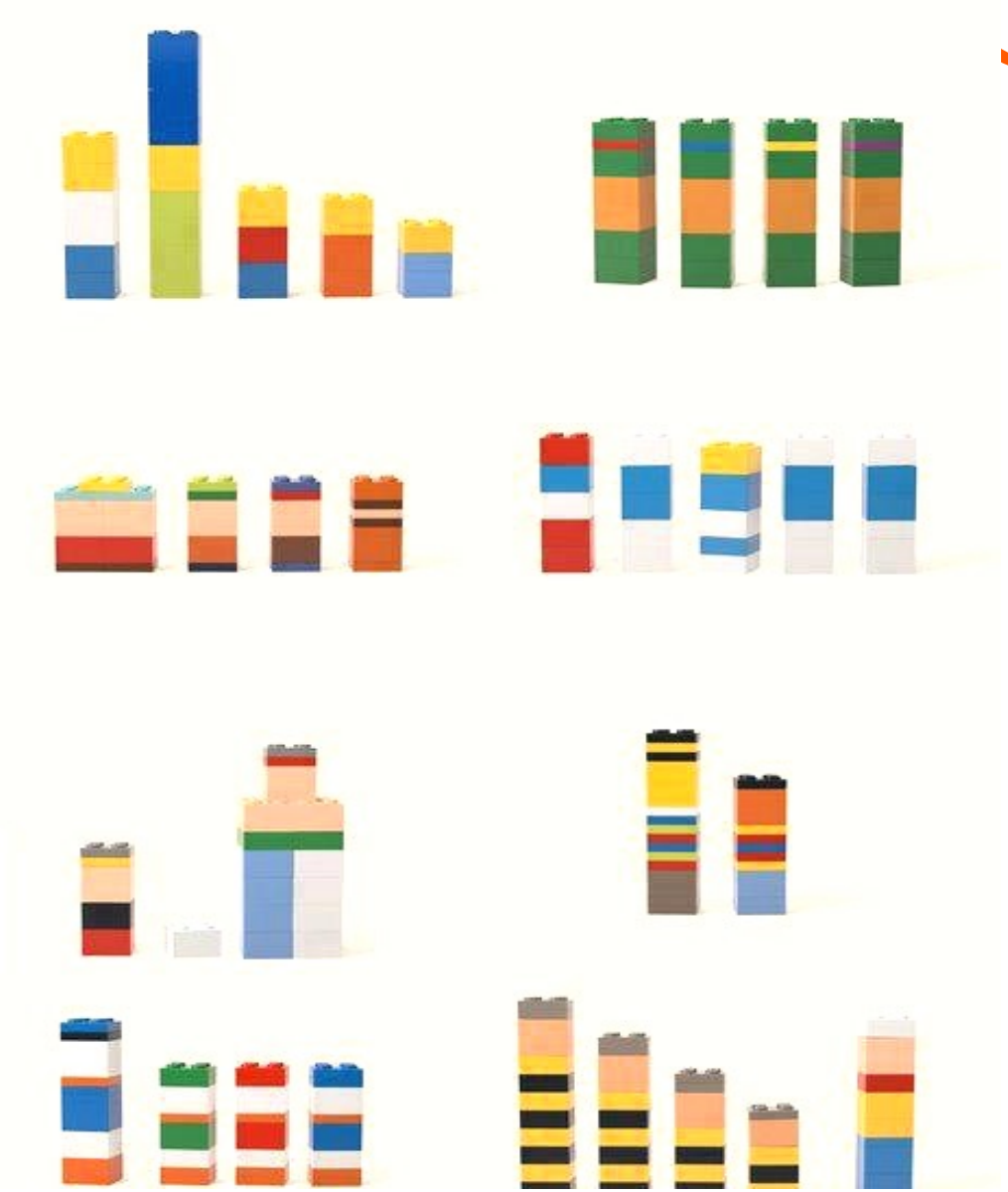
These are just
Legoblocks

3. Situation awareness

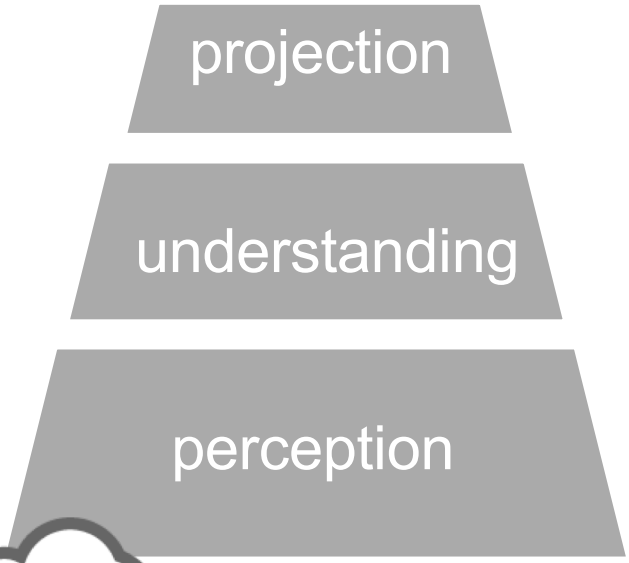
What you see
and understand
is influenced by
expectation

These are not
just legoblocks

We could distinguish
The Simpsons,
Asterix & Obelix,
Donald Duck etc.



3. Situation awareness



predicting future

understanding

recognition

detection

what we see/ hear etc. is influenced and filtered by expectation, experience, …
A very powerful and complex characteristic.

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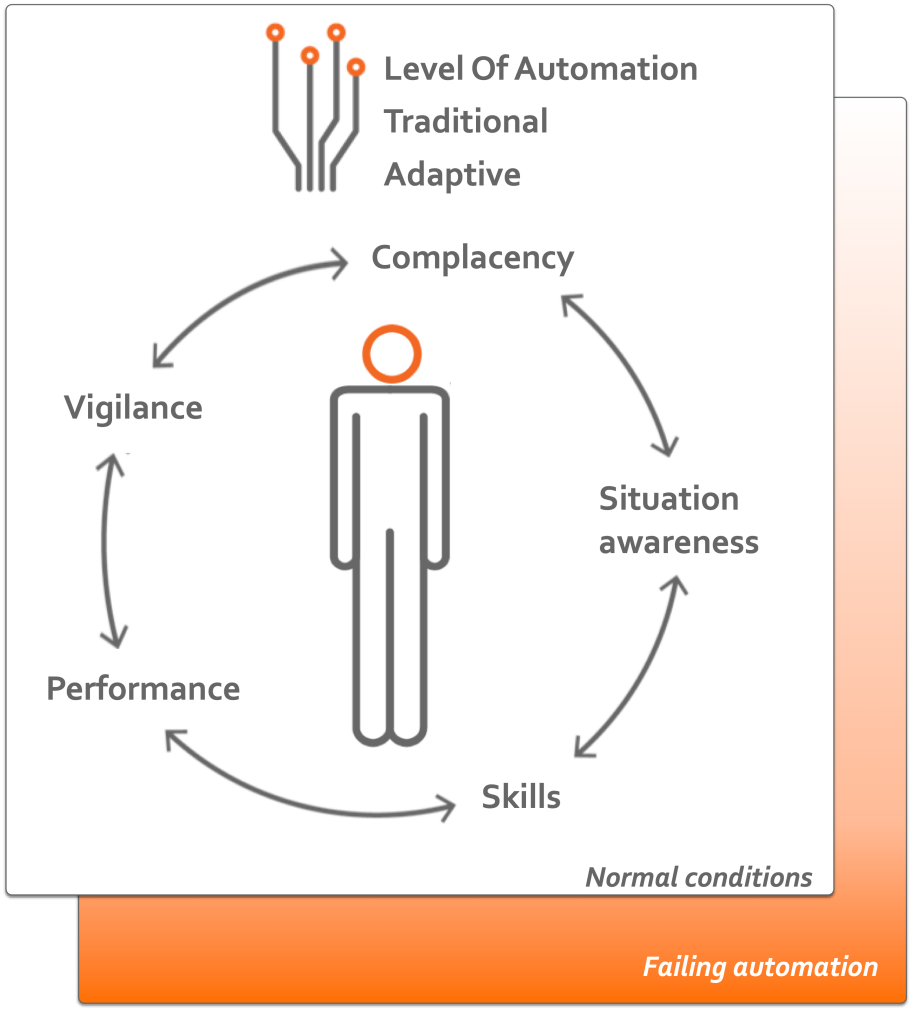
4. Irony of automation – Risk automation bias

Time criticality



System robustness

Organisation model

Competences

Technology affects:

- (human) tasks
- trust
- performance = reliance & compliance

What if the system fails – human reaction still proper? Reaction with can be worse than without automation

4. Irony of automation – DO's 'Imperfect' automation

Use of 'imperfect' automation needs considering of at least:

1. Proper interaction for optimal understanding
2. Timing & duration of alerts for optimal reaction
3. Robustness – unnecessary alerts & misses for managing long term compensation behaviour
4. (Calibration of) trust for optimizing situation awareness and understanding of the system
5. Introduction & training for correct understanding
6. Monitoring behavioral effects to understand whether socio-technical systems keep performing as intended

We need support and integration of our 'superman' qualities

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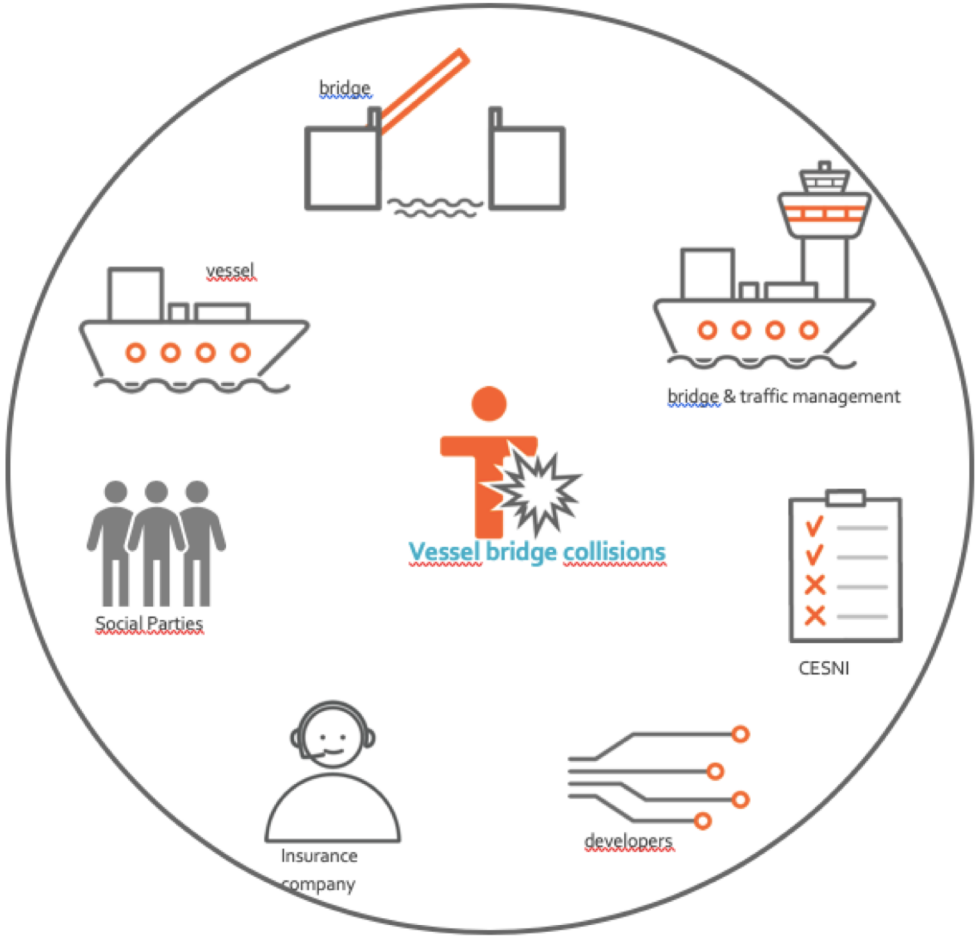
5. Causes vessel/ wheelhouse – bridge collisions ?



Systems approach

But what are real underlying causes of these collisions? Proper understanding leads to proper measures/ regulation.

Involved elements are divers, not only vessel-related but might also be related to information about waterway, fatigue, design of bridge, quality of automation etc. To be assessed in context and interests.

Structured understanding according to e.g. ISO 31000 on sociotechnical base

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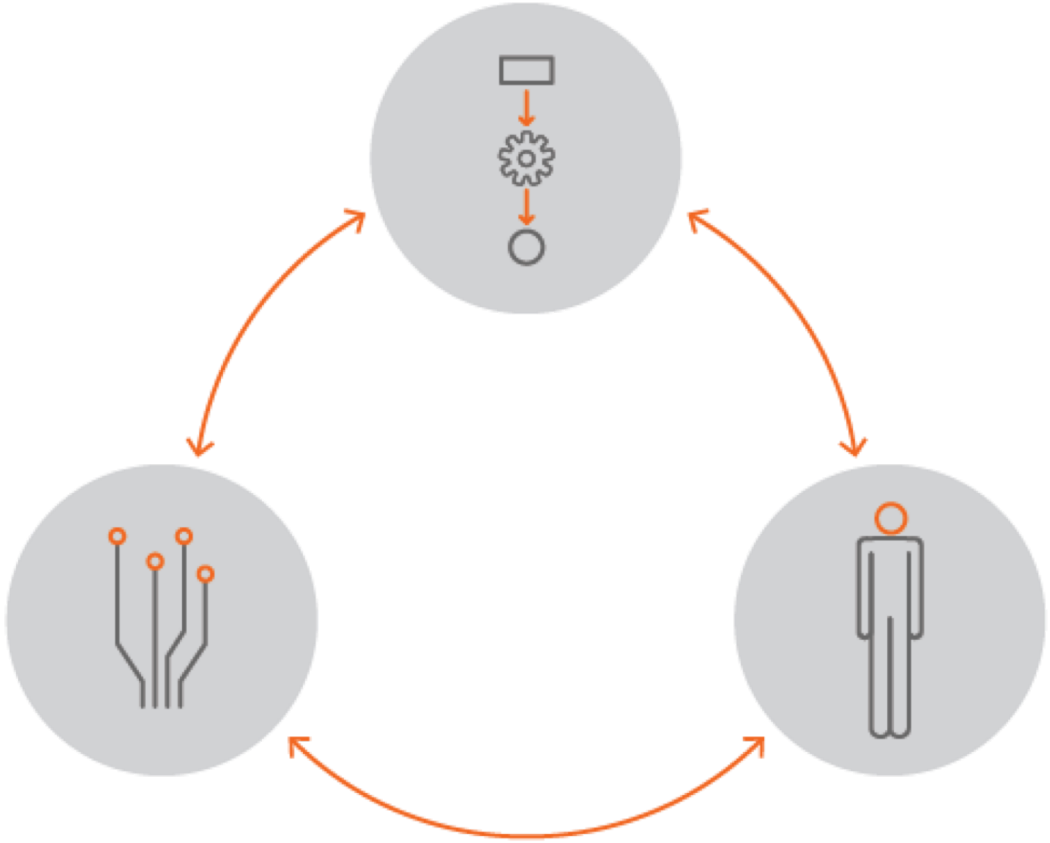
Conclusion – Never forget human factors

1. Memory
2. Level of attention
3. Situation awareness
4. Irony of automation

5. System approach
   underlying root causes of human behaviour during these incidents to understand contributions to develop relevant measures



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Thank you for your attention

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