



InnoRenew CoE

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Perceptions of materials and occupant satisfaction

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**TIMBER - A HEALTHY FUTURE
FOR SUSTAINABLE BUILDINGS**

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2019

How we do perceive?

stimuli

sensation

meaning



sensory
reception

receiving the
information
through stimuli

selection and
organization

sorting stimuli
into a meaningful
pattern

interpretation

formation
of an idea about
the information

response

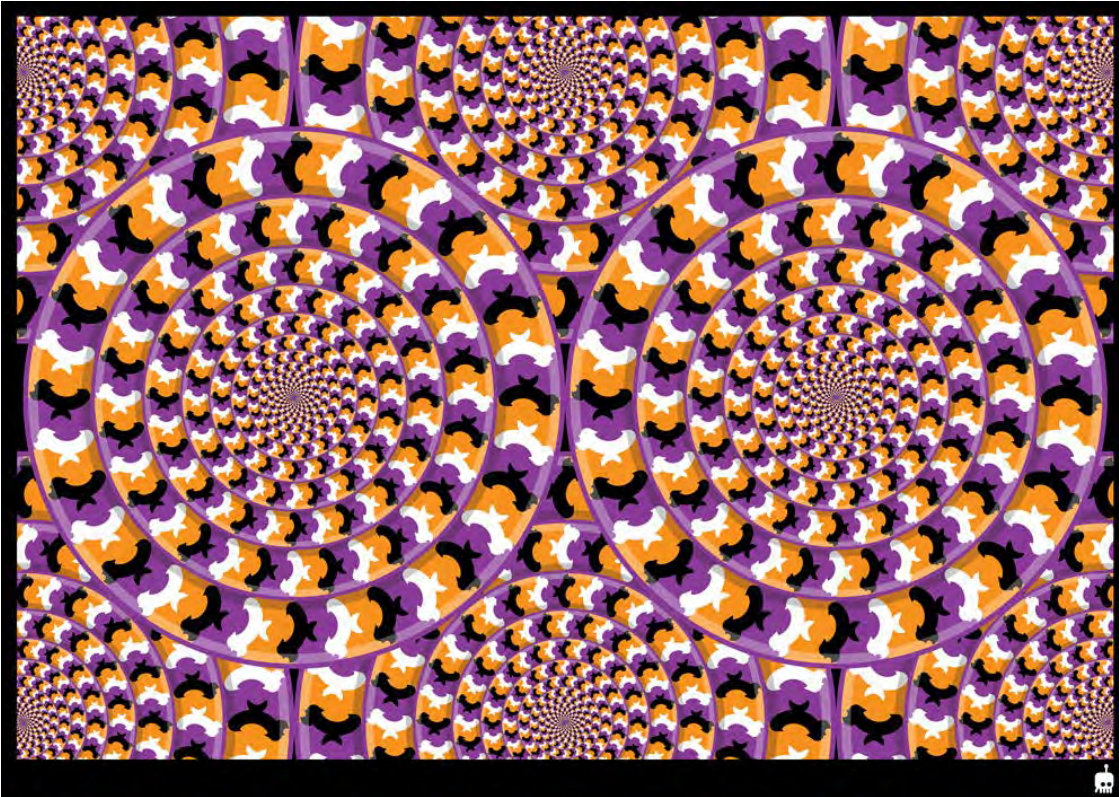
perception

Use of senses to explore the surrounding world

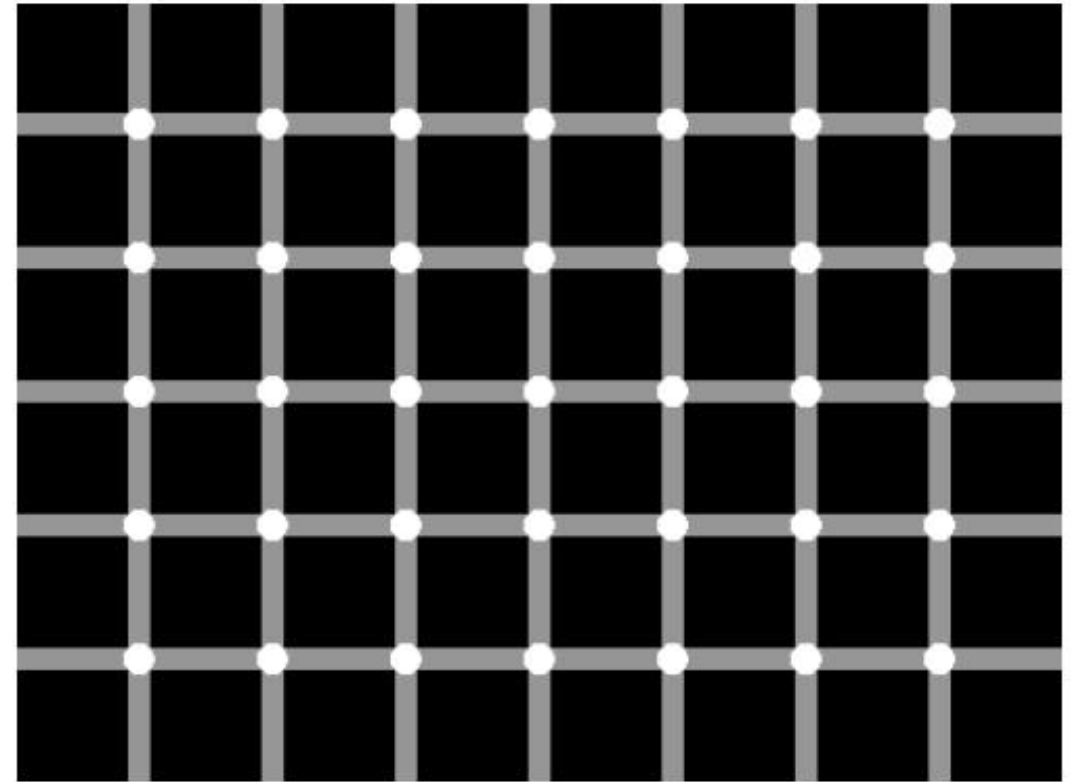
The richness of subjective experience depends on the number of sensory modalities received at once



Can we trust our senses?



Is this moving?



Count the black dots...

Senses versus sensors

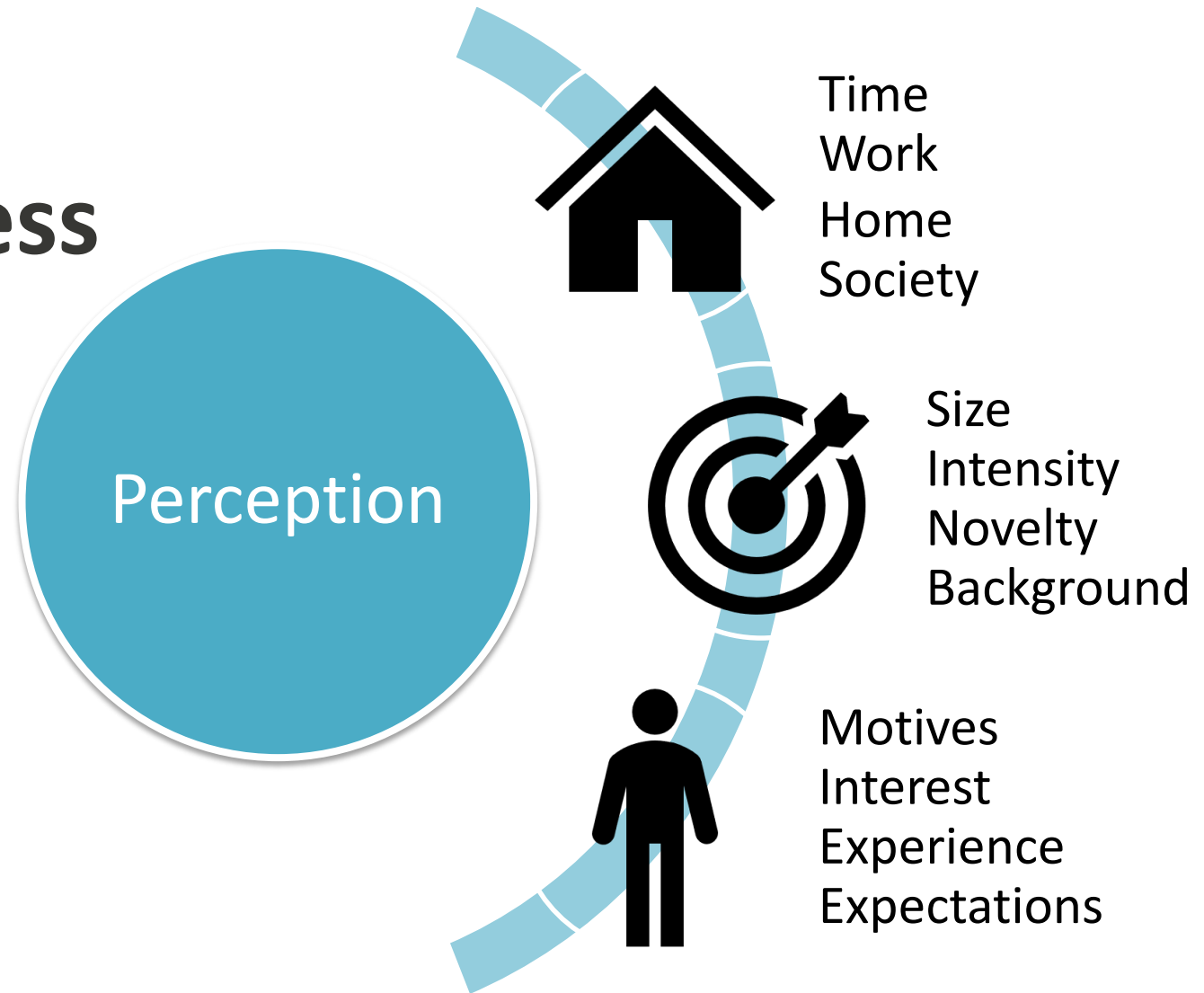


sight



touch

Factors affecting perception process





Safety





Functionality





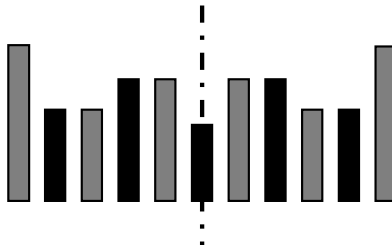
Aesthetics... always as expected?



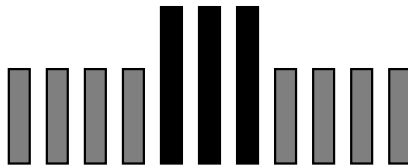
Norman Foster Chesa Futura - St. Moritz

What is “beauty” in architecture?

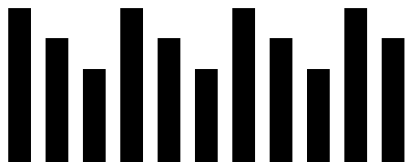
symmetry



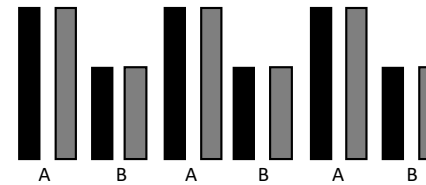
hierarchy



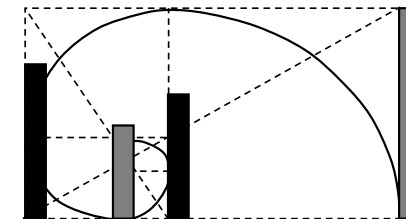
harmony



rhythm



proportion



Other aspects affecting what we do prefer?



- Price

- Innovation and advancement

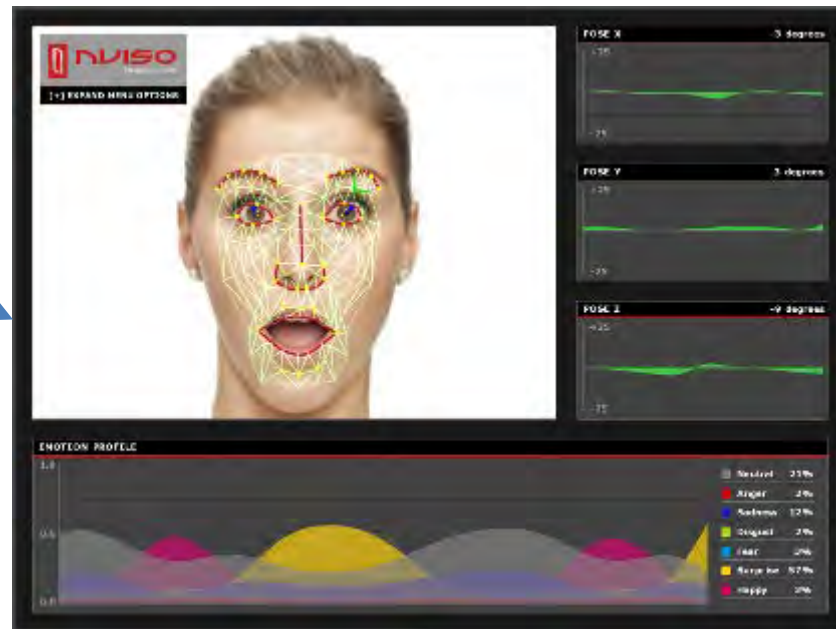
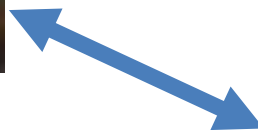
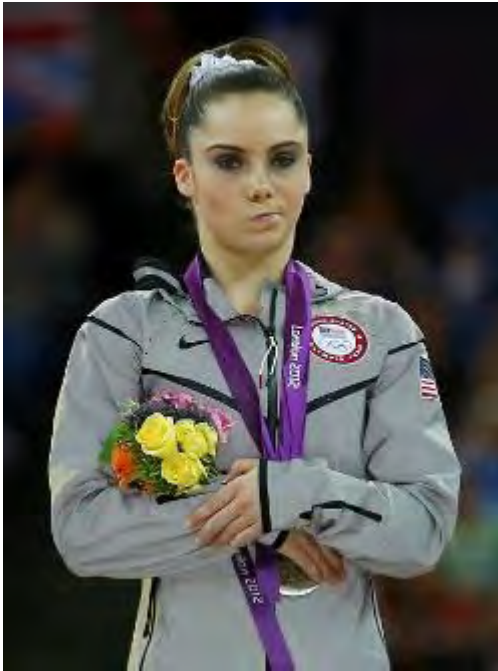


- Trends and fashion

- Environmental aspects



How to measure if we like something...





Categories of sensory analysis tests

- **Preference** (if customers like the product? if the product is preferred over another? if customer intent is to use it?)
- **Difference** (does the difference exist? would people notice the difference? how would you describe the difference?)
- **Descriptive** (what are products sensory attributes? how those properties change due to processing, packaging, storage?)

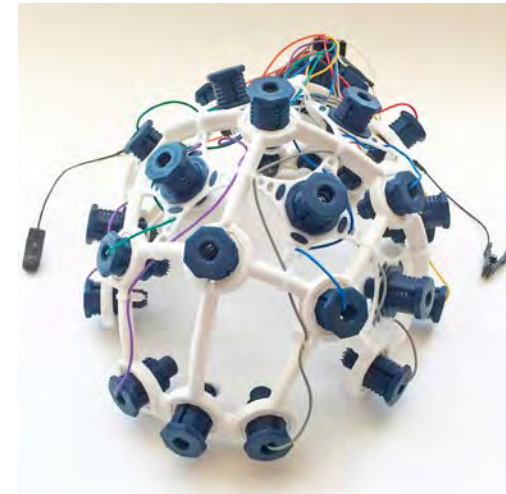


Surveys/questionnaires

- Might provide quantitative and/or qualitative feedback
- Can be performed with prior training or without any preparation
- Can be performed by using only visual stimuli or including other senses (in both cases, use of real or virtual samples can be implemented)
- Tests of preferences might be designed in a complex way and be combined with other factors influencing the customer choice:
 - economic issues (investment cost, maintenance frequency)
 - environmental awareness (local/imported resources)

Measurement of physiological responses

- Recently, it has become more common to make simultaneous measurements of multiple physiological indicators
- Common physiological evaluations include:
 - brain activity
 - autonomic nervous activity
 - endocrine activity
 - immune system activity

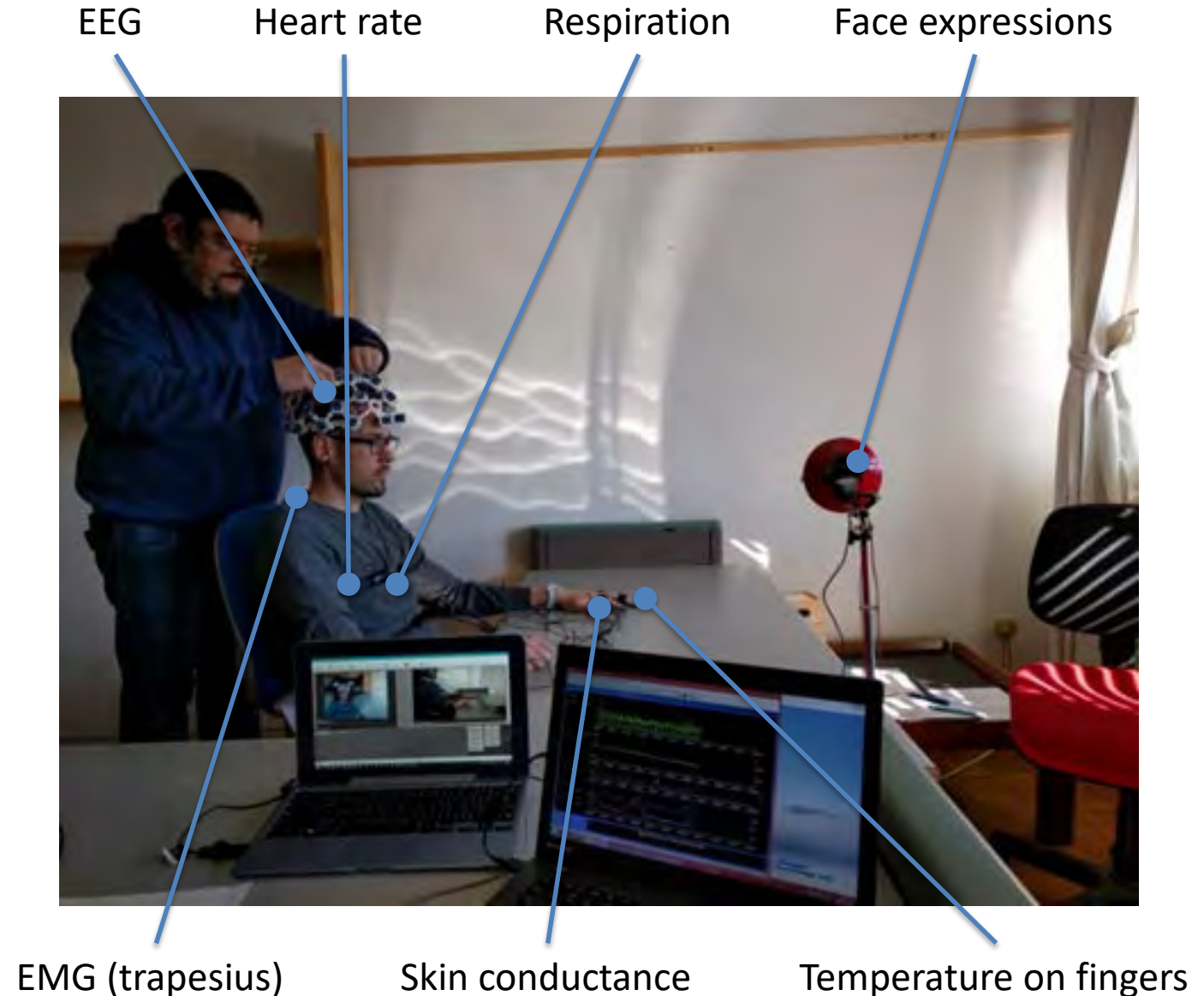


Facial emotions



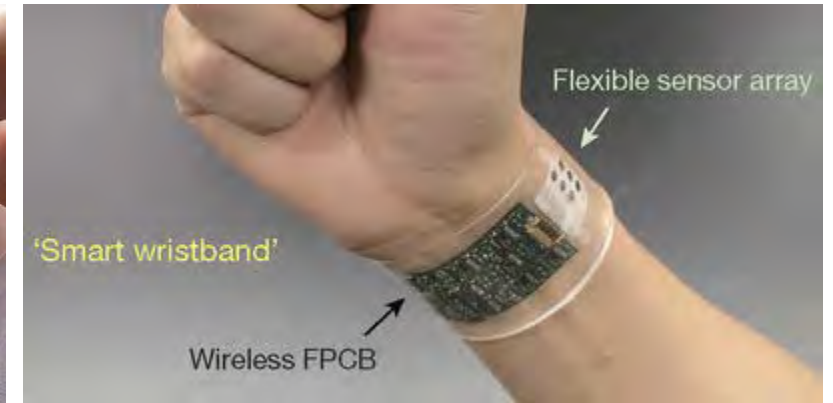
Methods suitability

- **is it intrusive?** - the degree of the input channel capture is influencing the experience values measured (based on subjective participant opinion)
- **is it robust?** - the level of the user experience procedure interfering with input channels capture
- **is it informative?** - whether the channel differentiated modes and sample types



Future trends

- wearable sensors
- embedded sensors
- wireless
- not intrusive and not invasive
- robust and informative
- emergency detection systems at home



Perception of «naturalness» - **multiple select**

feet touch
and vision



vision

olfaction

vision and haptic perception

haptic perception

intuition – “sixth sense”

stand used for verification customers preferences by means of different senses



Is this wood? – **binary response**





**Which façade
do you prefer?
Select up to
5 images you
like most –
multiple select
with forced
rank**





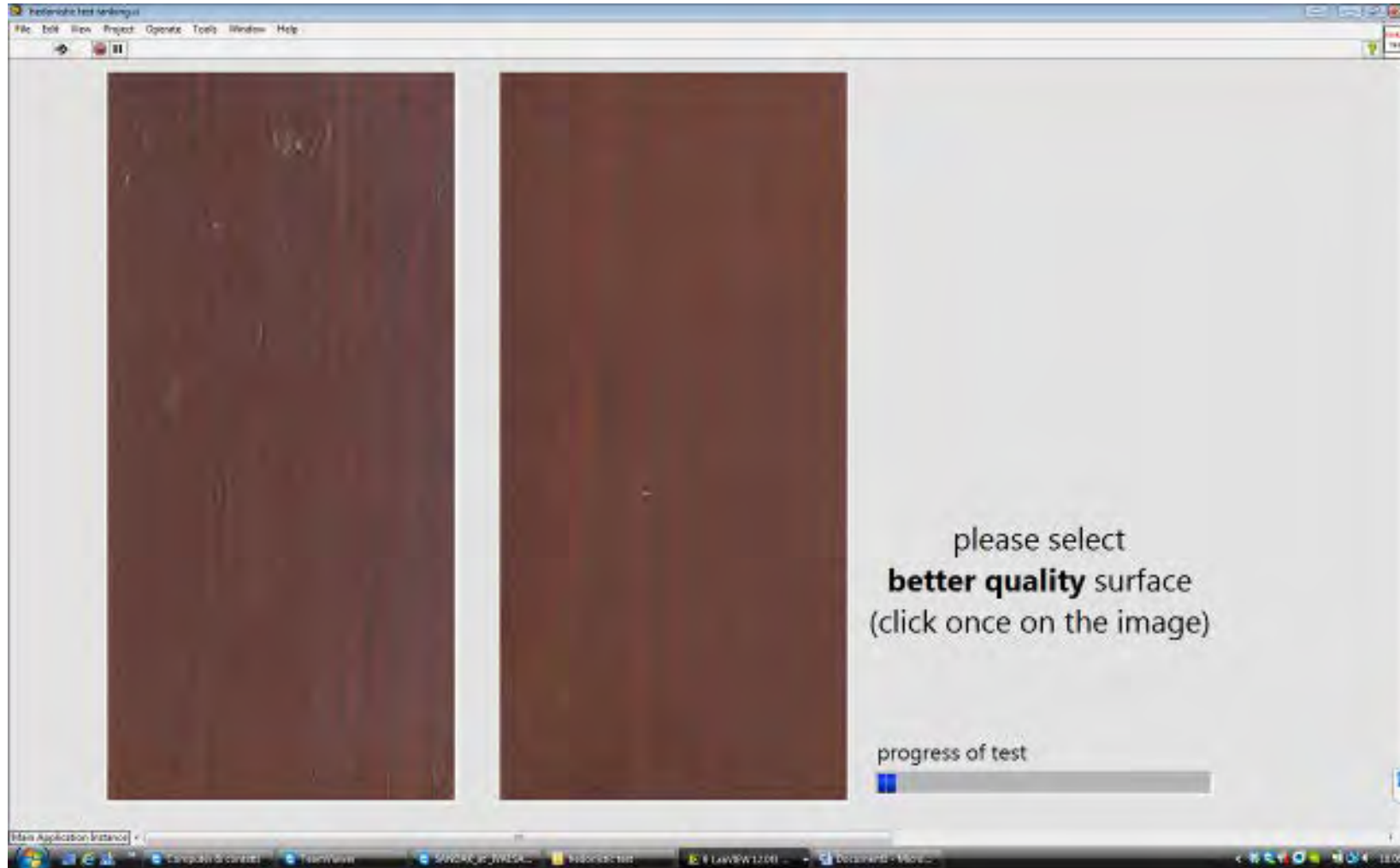
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Descriptors definition

Attribute	Descriptor	D. class	Definition	Descriptor values
A	Orientation	Design and installation	Orientation of boards in the façade	0-Vertical 1- Horizontal
B	Size of boards	Design and installation	Size of boards in the façade	0- Large 1- Tiny
C	Spacing gaps	Design and installation	Presence and size of gaps between boards	0- Spaced out 1- Tight
D	Effect	Design and installation	Architectonic effect/style	0- Rustic 1- Modern
E	Lightness	Colour	Degree of white/black in the colour	0- Dark 1- Bright
F	Saturation	Colour	Colour saturation	0- Bleached 1- Saturated
G	Natural look	Colour	Natural colour and texture of the material visible or covered by a paint	0- Natural 1- Not natural
H	Treatment	Colour	Painted-coated-impregnated	0- Treated 1- Not treated
I	Homogeneity	Texture	Overall homogeneity of texture	0- Nonhomogeneous 1- Homogeneous
L	Stains	Texture	Presence of stain/mottle/discoloration	0- Stained 1- No stains
M	Knottiness	Texture	Overall presence of knots	0- Knotty 1- Not visible knots
N	Cracks	Texture	Presence of visible cracks in the boards	0- Cracked 1- No cracks
O	Weathering	Condition	Sign of weathering	0- Weathered 1- Fresh



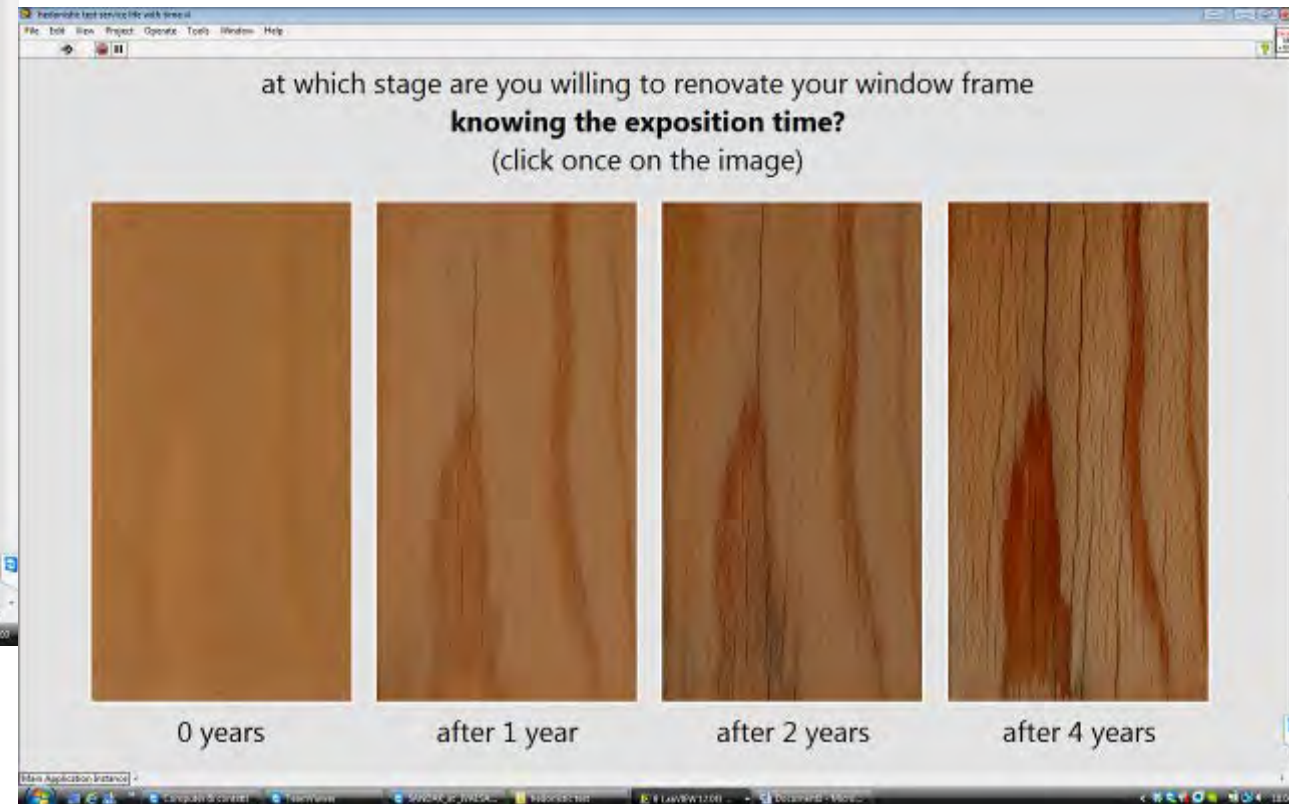
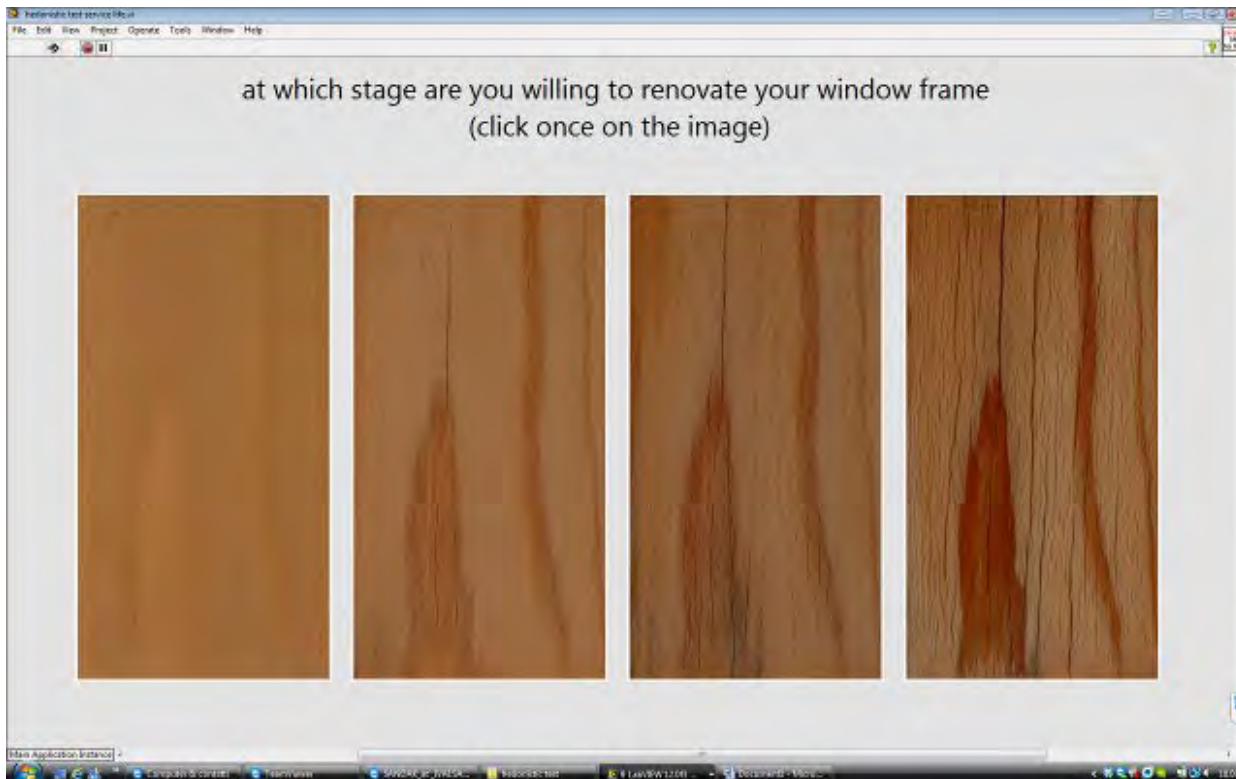
Select one of two you like most – **single select**





Define acceptance limit #1 – **single select**

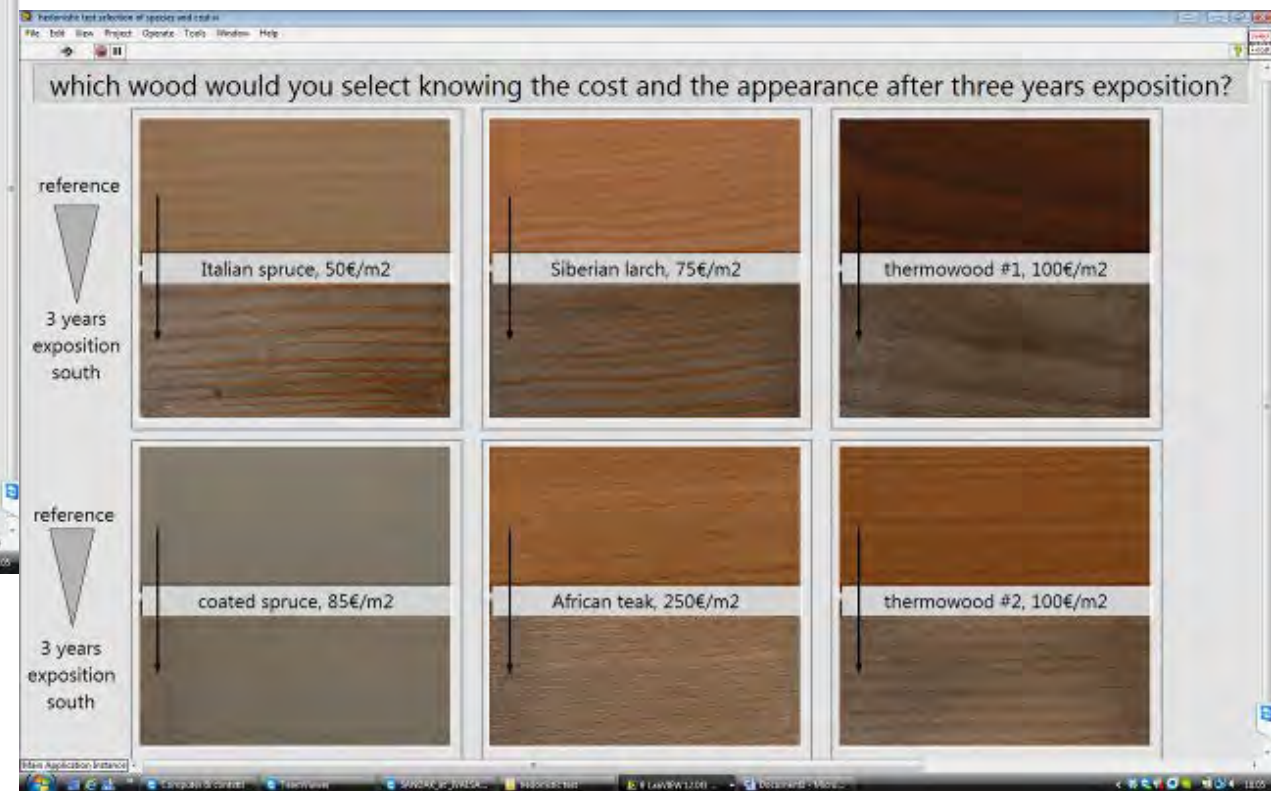
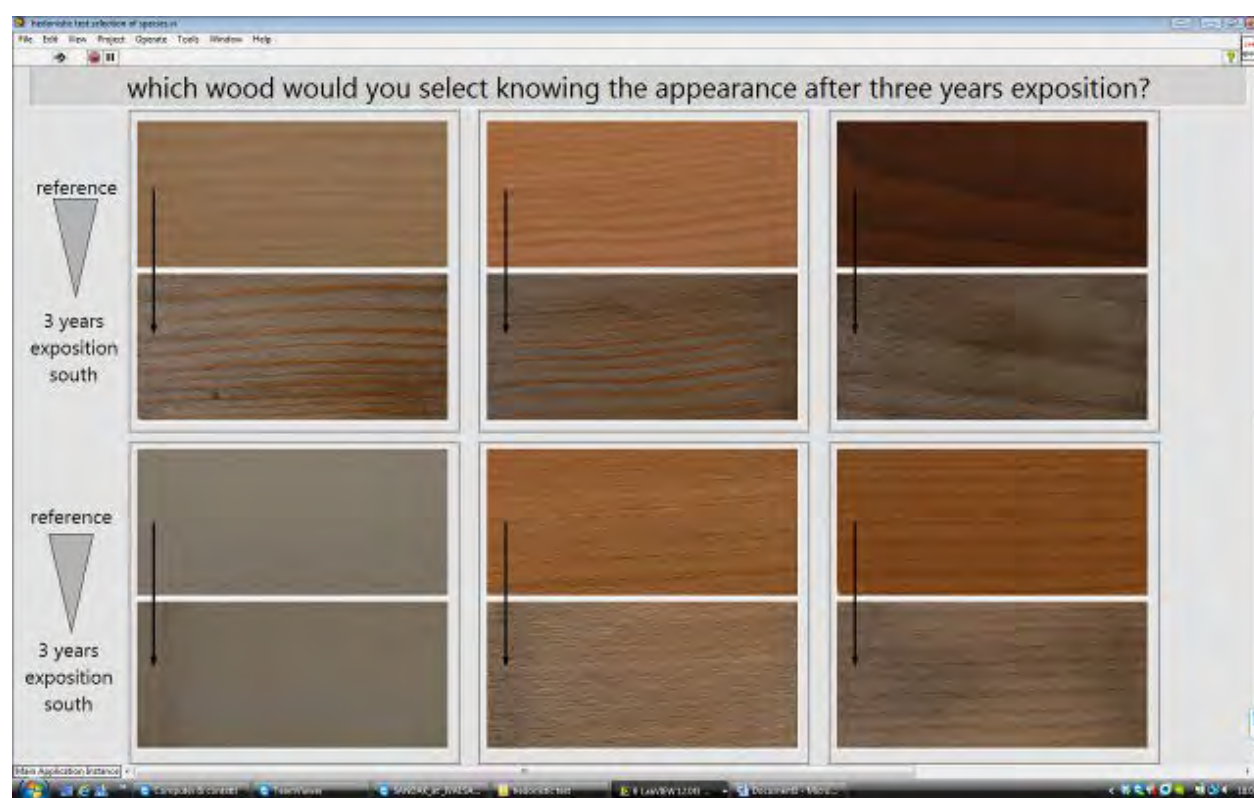
+ maintenance time





Define acceptance limit #2 – **single select**

+ environmental consciousness



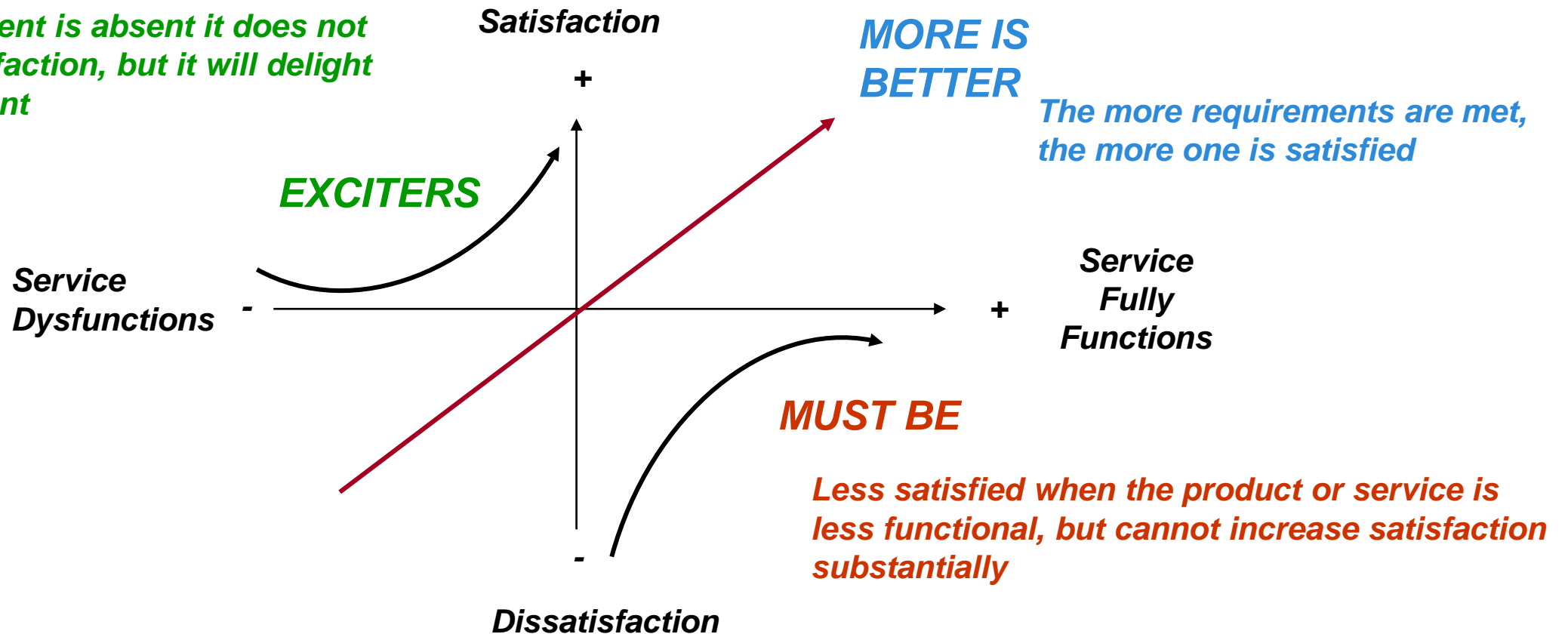


Customer perception and satisfaction

- **Customer perception** is a marketing concept that includes a customer's impression, awareness, and/or consciousness about a company or its offerings
- **Satisfaction** is the difference between what was perceived and what was expected

Customers satisfaction – Kano model

If the requirement is absent it does not cause dissatisfaction, but it will delight clients if present



Attractive (delight) needs



- mostly the unspoken needs that the customer cannot define
- not expected by the customer – so if the product or the service does not provide them, the customers are neutral, since they were not expecting them in the first place
- but if the product or service provides them, the customers are excited



The effect in terms of the use of timber in the built environment?

- Original design
- Expressive architecture
- Cultural identity
- Extra services, e.g., façade leasing concept
- Unexpected properties, e.g., self-cleaning, self-healing
- Connection between people and place
- Restorative and regenerative effect
- ???



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Thank you for your time.