

■ Petsekletser

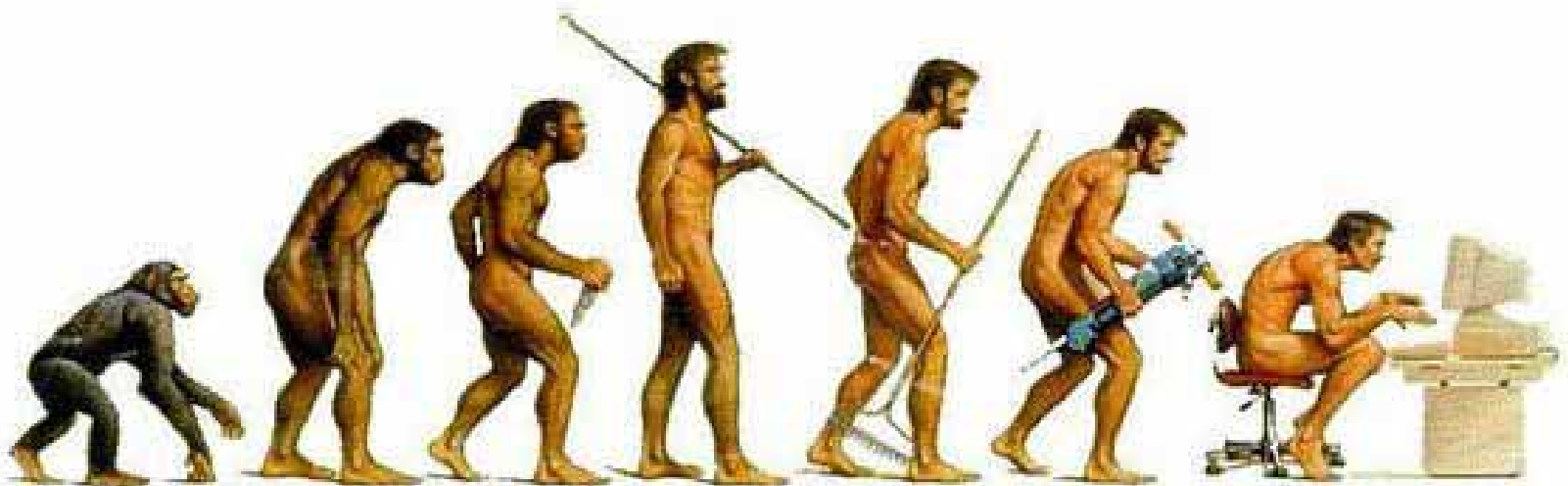
Makes office workers move in a stiff and conservative environment

Graduation Presentation
Integrated Product Design

Astrid Heijnen

May 15th 2014

■ Evolution



■ Evolution



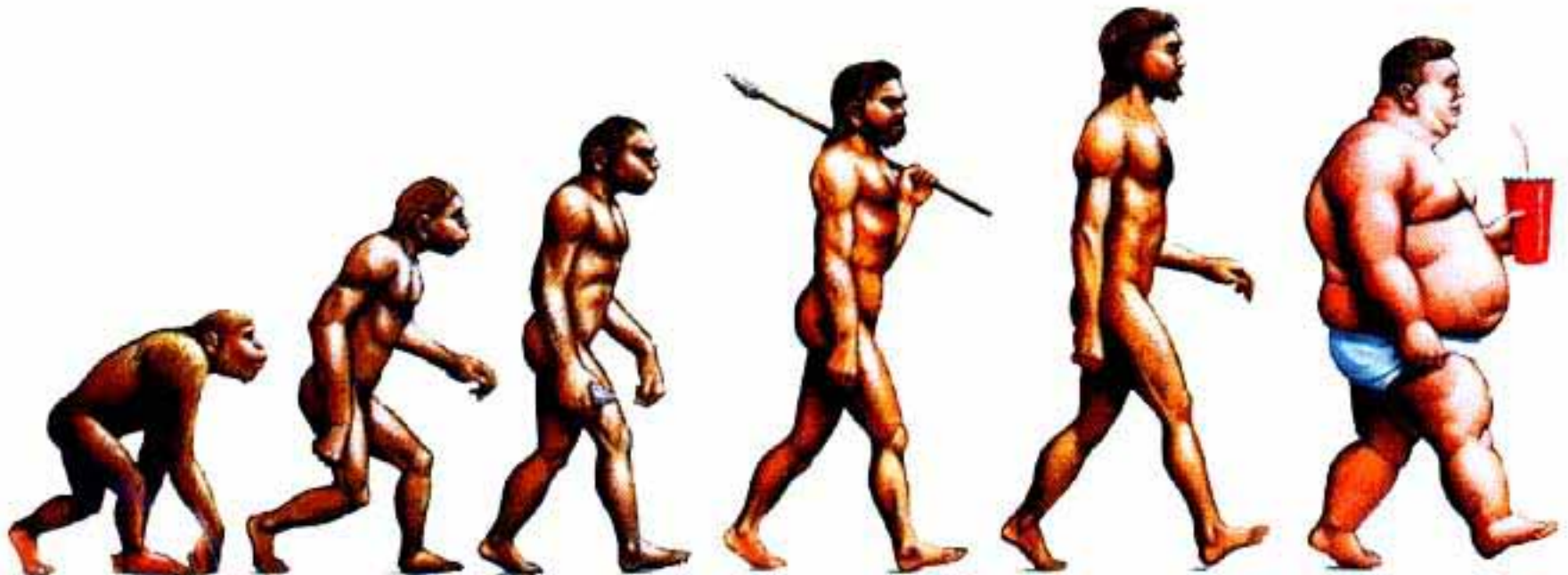
- Evolution



■ Evolution



■ Evolution



*Working adults in Australia sit almost 10 hr per day.
About half of this sitting time is spend at work.*

*5,8 million people in The Netherlands work solely sitting
or standing*

*Computer work is mostly done sitting. 40% of the people
working in the E.U. work with the computer*

■ Current products



■ Current products



- Company



CENTER FOR
PEOPLE AND
BUILDINGS

■ Assignment

“Come up with an innovative design to **stimulate physical vitality** of **employees** in the **Office** that can be implemented as showcase in Gulliver’s Dock.”

■ Assignment

“Come up with an innovative design to **stimulate physical vitality** of **employees** in the **office** that can be implemented as showcase in Gulliver’s Dock.”

N.B. Make sure it is going to be used on long-term base.

■ Presentation structure

Context

- . Target group
- . Behaviour
- . Physical Environment
- . Reformulated assignment

Petsekletser

- . Design
- . Product structure
- . Parts
- . Different version

Evaluation

Recommendations

■ Target group



Companies



Employees

■ ■ ■ ■
Context

■ ■ ■ ■
Petsekletser

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Evaluation

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Recommendations

■ Customer // companies

Medium to large companies

- 50+ employees
- Annual turnover or an annual balance sheet of more than 10 million
- 12.985 in The Netherlands



Source: CBS

■ Customer // companies

(From SpringLab survey, 24 HR-managers)

- Cheap
- Easy to implement
- Easy accessible
- Comply with the needs of the employees
- Fun and challenging
- Company benefits should be clear
 - Increase of productivity
 - Decrease absenteeism
 - Improve image

■ User // employees

- 18 - 67 years
- Male & female
- Different education levels
- Different nationalities



■ User // employees

What do they want?

- User study SBRCURnet
- Other research



■ User // employees

- Most people would like to change the sedentary situation

■ User // employees

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- People come the office to work, not to work out

■ User // employees

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- Time pressure, company culture and lack of facilities are obstructing factors

■ User // employees

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- They don't want to interrupt their workflow

■ User // employees

- Most people would like to change the sedentary situation
- People come the office to work, not to work out
- Time pressure, company culture and lack of facilities are obstructing factors
- They don't want to interrupt their workflow
- Most heard complaints are stiffness and pain in back, shoulders and neck, and concentration and productivity loss

■ User // employees

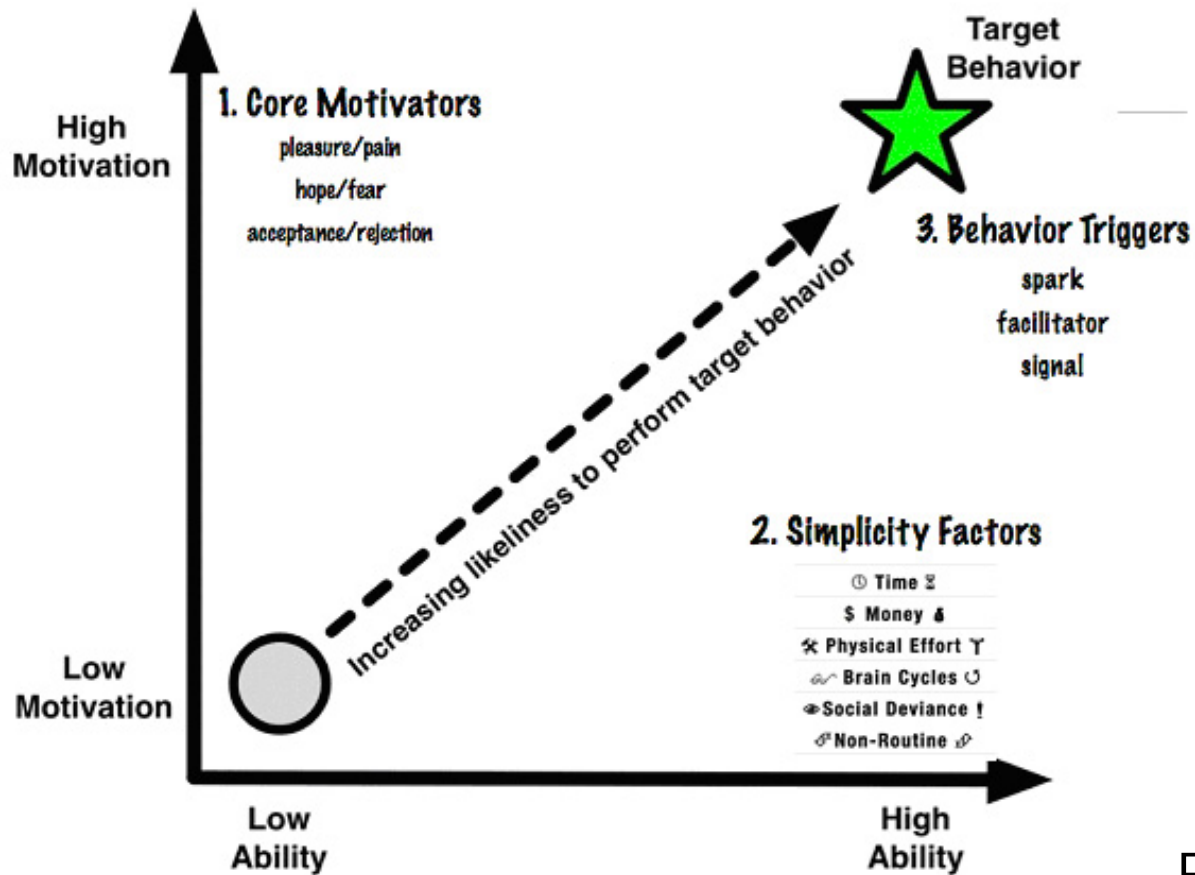
- Most people would like to change the sedentary situation
- People come the office to work, not to work out
- Time pressure, company culture and lack of facilities are obstructing factors
- They don't want to interrupt their workflow
- Most heard complaints are stiffness and pain in back, shoulders and neck, and concentration and productivity loss
- Many people have no idea how to solve the problem

■ Behaviour

Two theories were used as design guide:

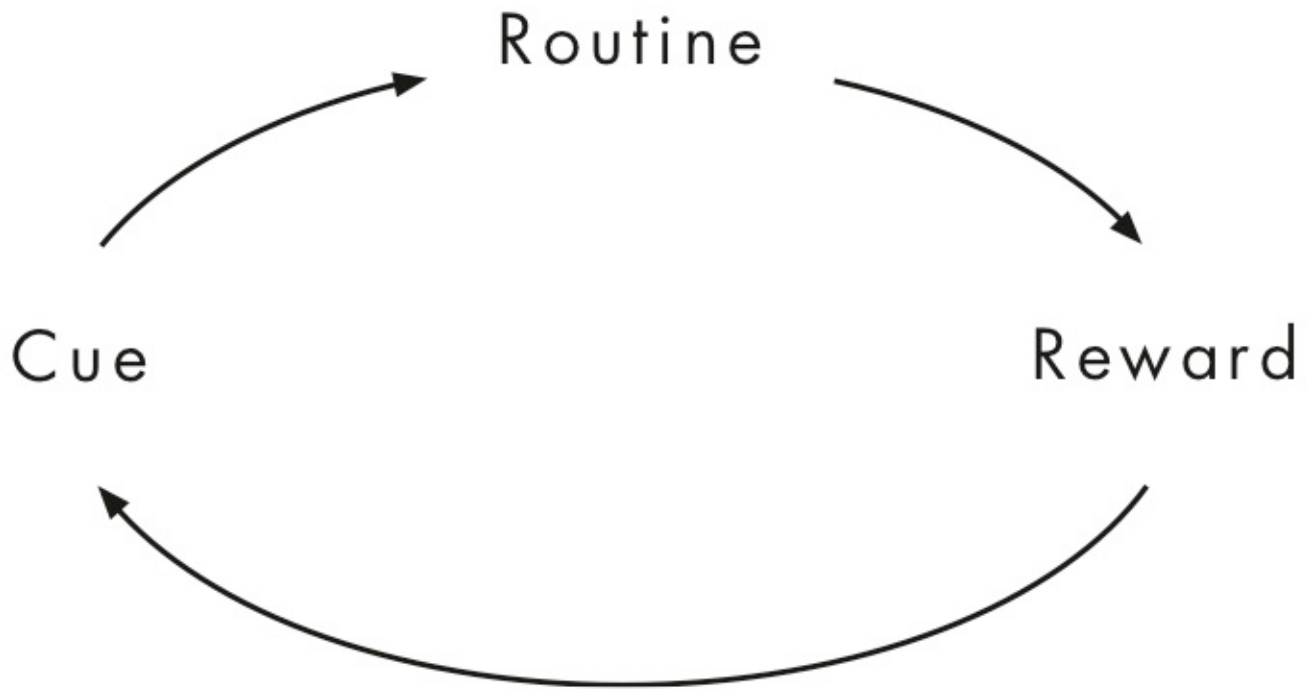
- BJ Fogg's Behavior Model
- Duhiggs' Power of Habit

Behaviour // Fogg Behavior Model



BJ Fogg

■ Behaviour // habit



Charles Duhigg

■ Environment // interior



■ ■ ■ ■
Context

■ ■ ■ ■
Petsekletser

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Evaluation

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Recommendations

■ Environment // wall & ceiling



■ ■ ■ ■
Context

■ ■ ■ ■
Petsekletser

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Evaluation

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Recommendations

■ Environment // clothing



■ Reformulated assignment

“Stimulate movement of the upper body while going from A to B in the office”

■ Petsekletser



■ ■ ■ ■
Context

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Petsekletser

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Evaluation

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Recommendations

■ Petsekletser



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Context

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Petsekletser

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Evaluation

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Recommendations

■ Petsekletser



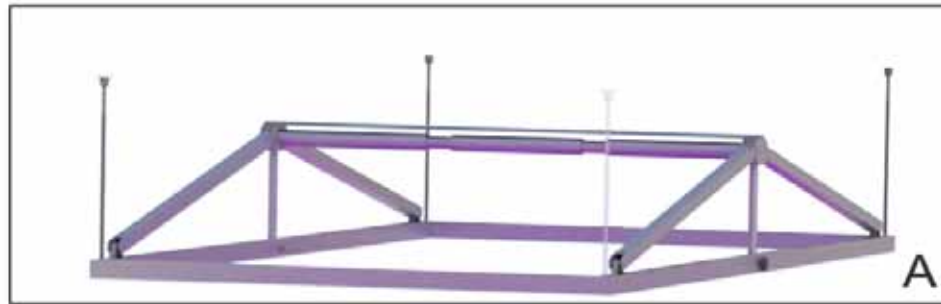
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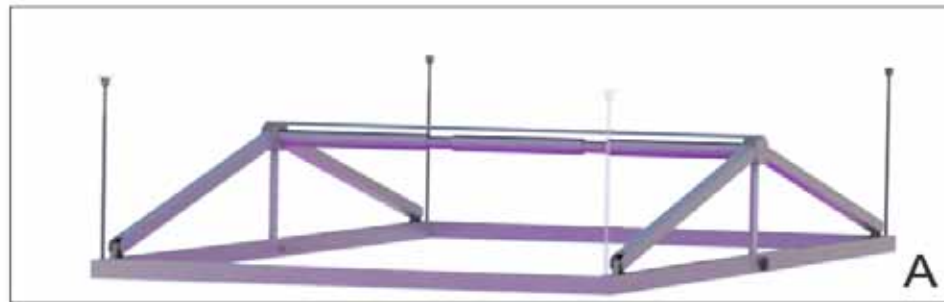
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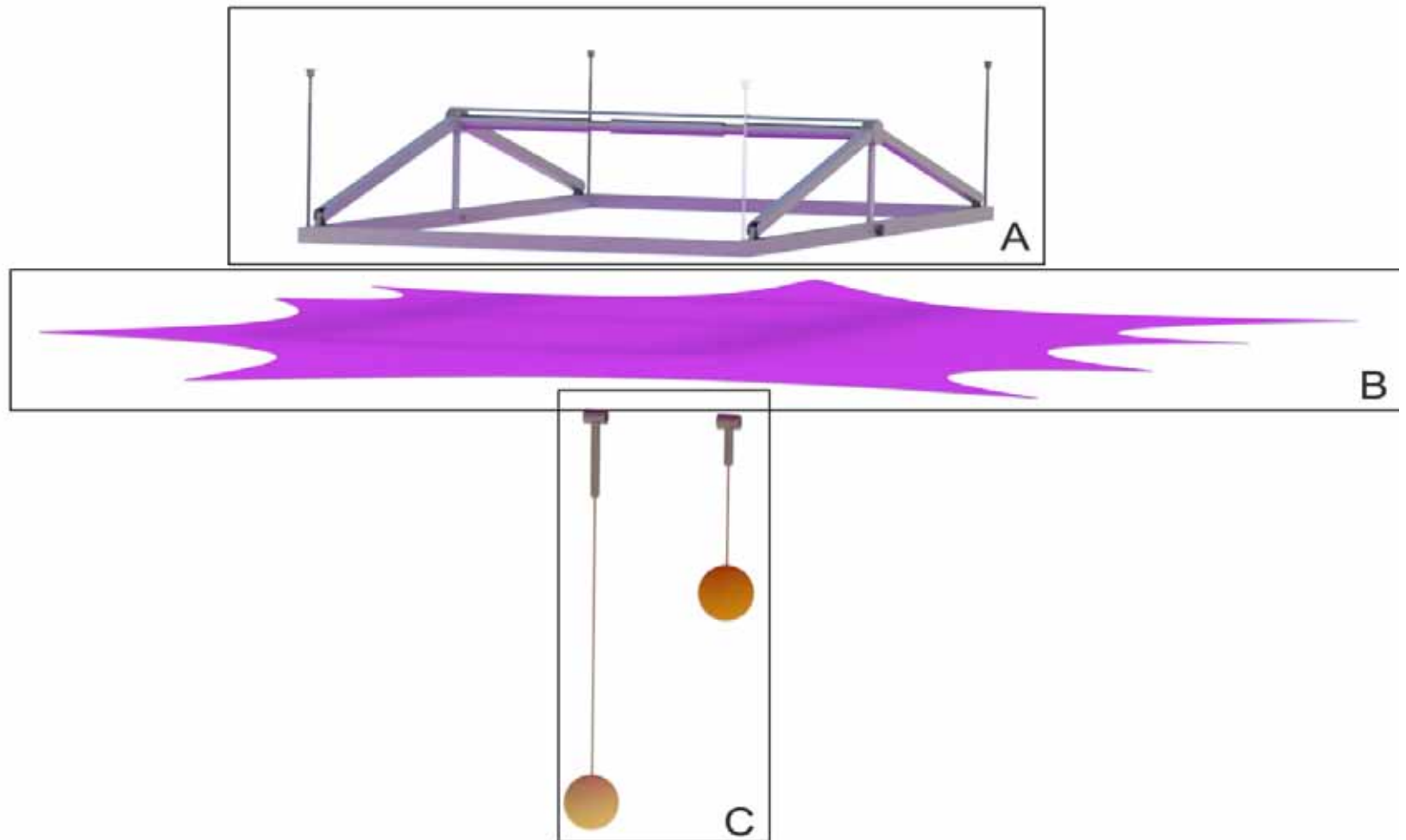
■ Frame



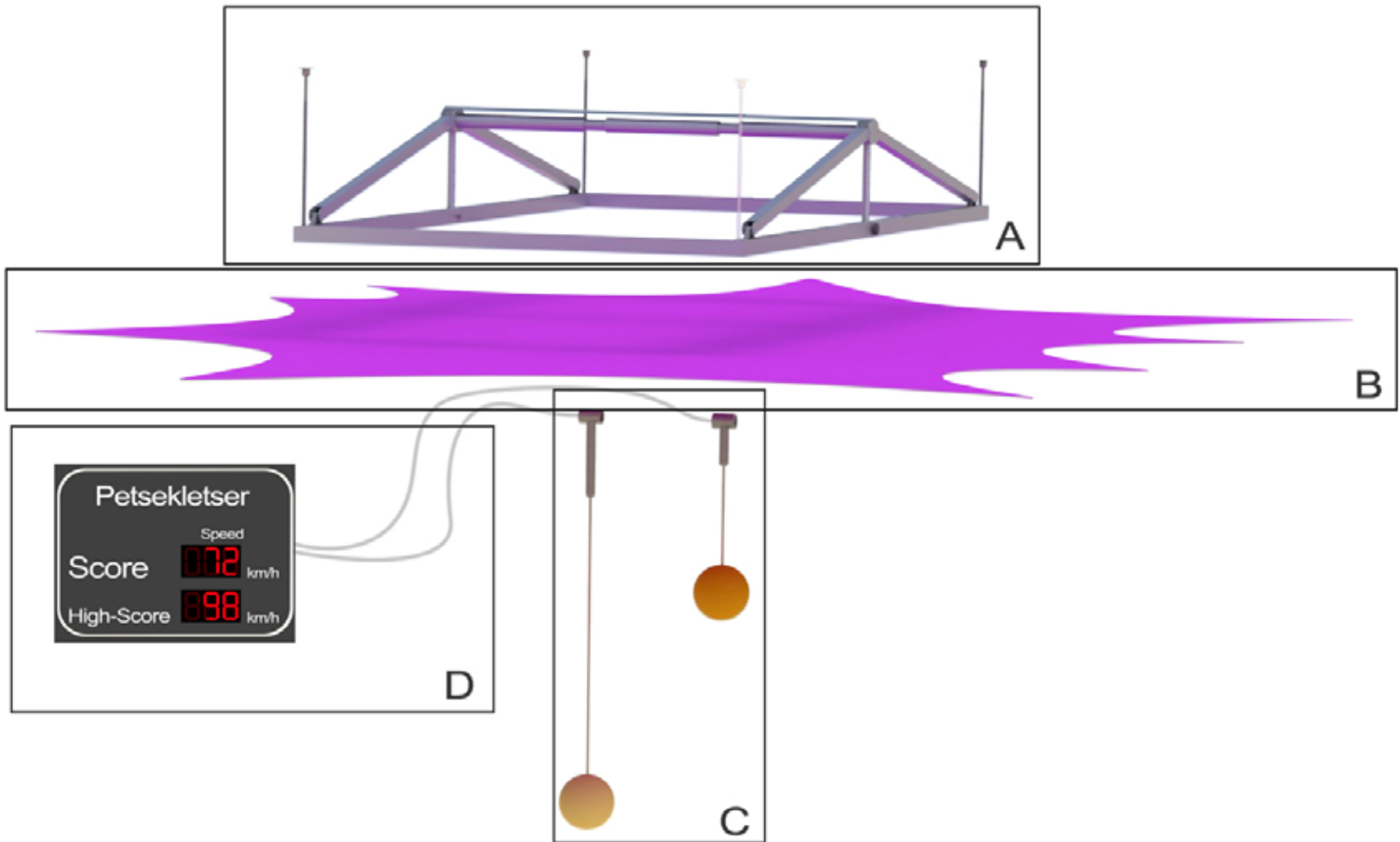
■ Fabric

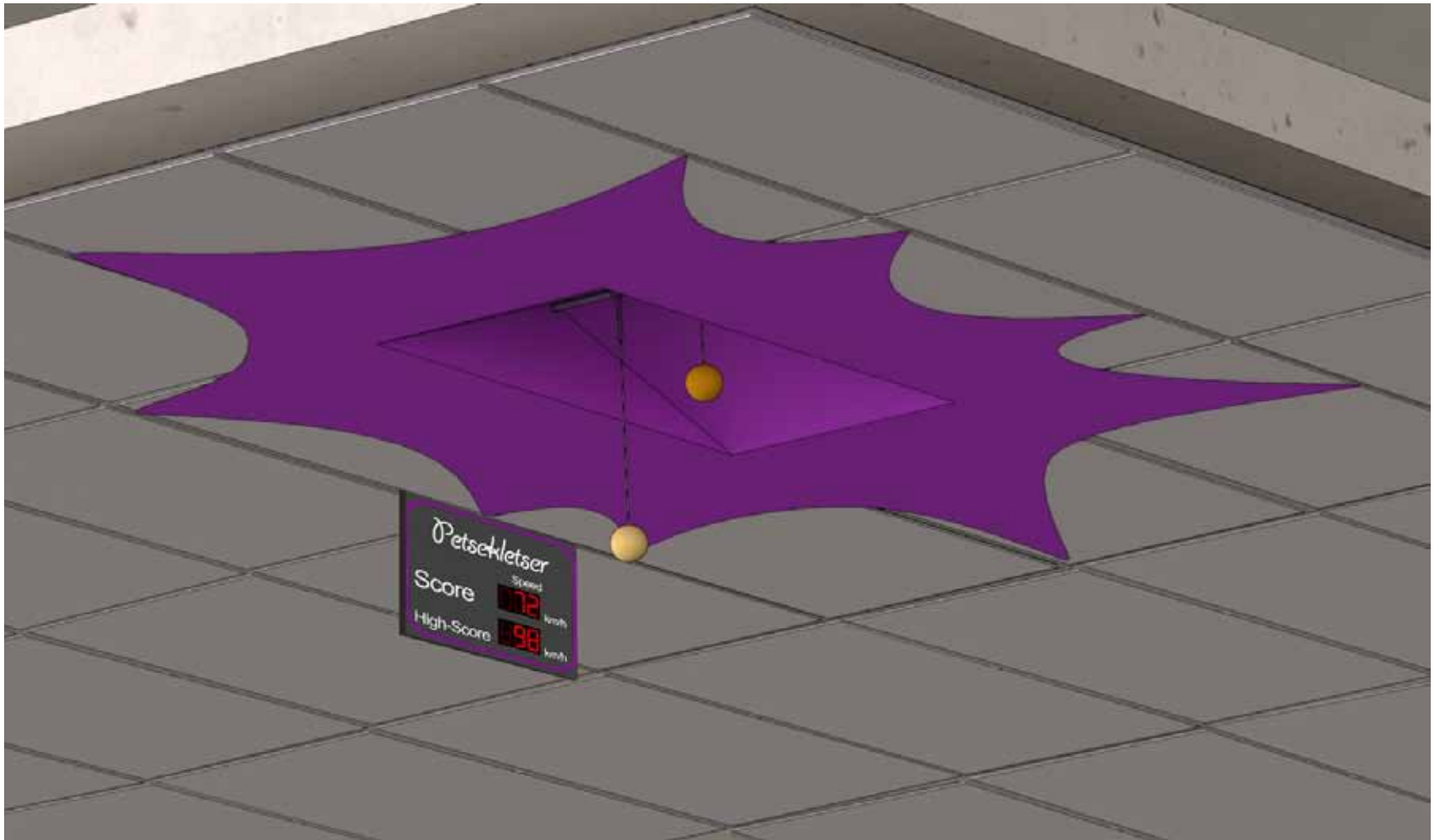


■ Balls



Screen & Sensors





■ ■ ■ ■
Context

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Petsekletser

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Evaluation

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Recommendations

■ Fabric // appearance



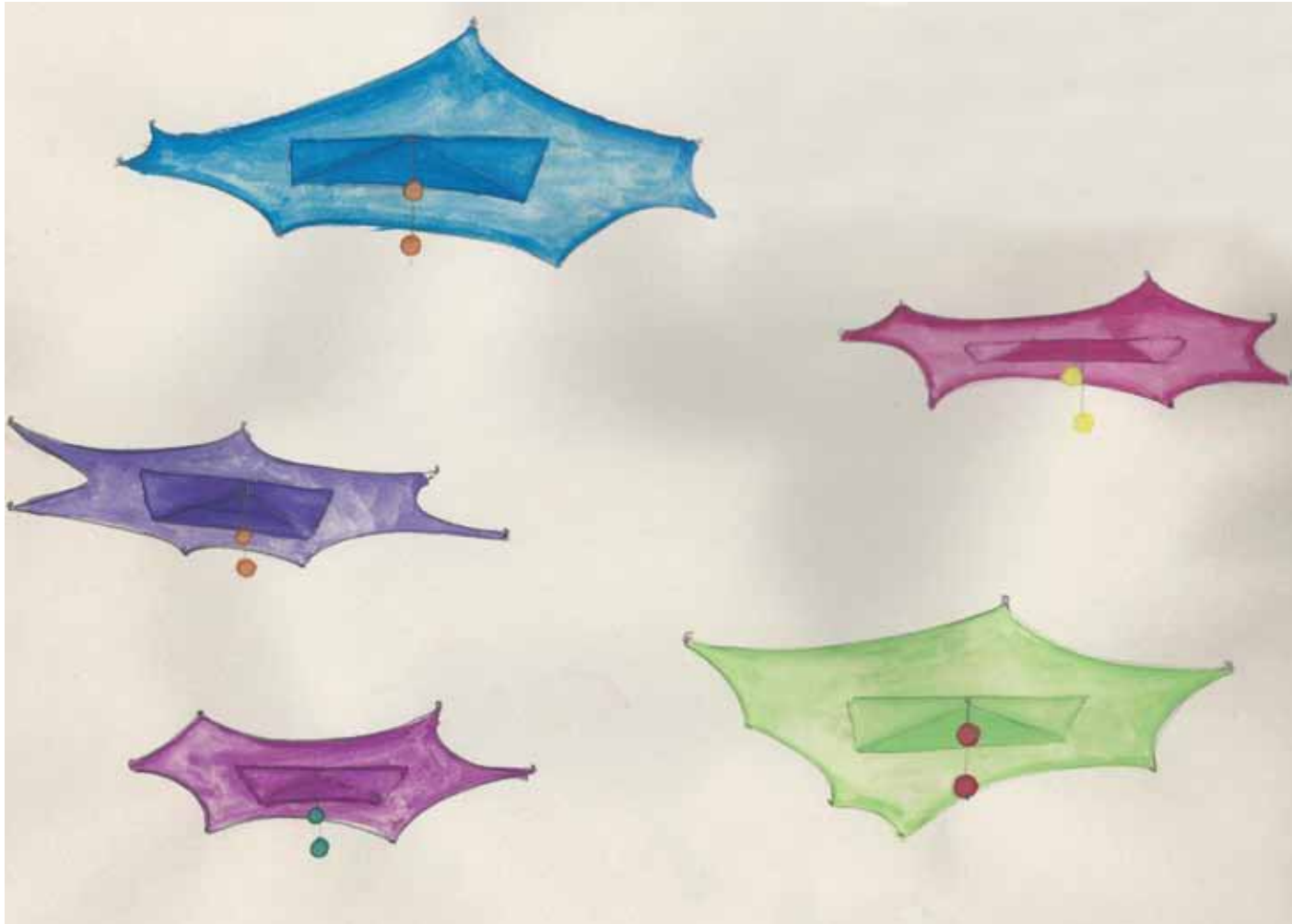
■ Fabric // appearance



■ Fabric // appearance



■ Fabric // appearance



■ Fabric//connection



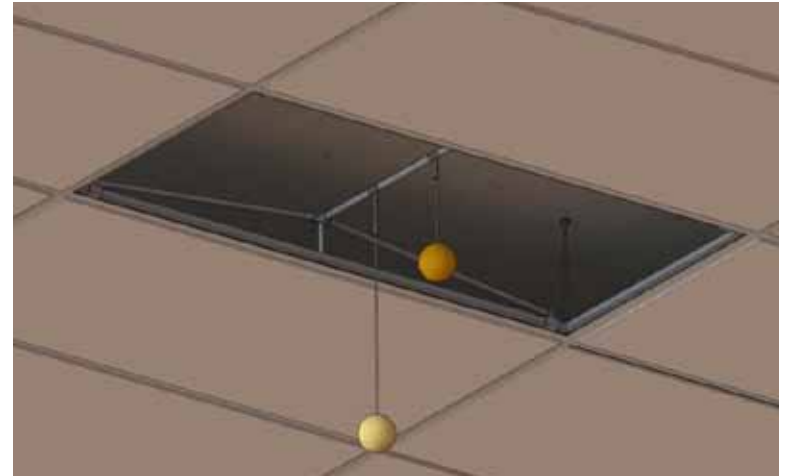
■ Fabric//nuisance



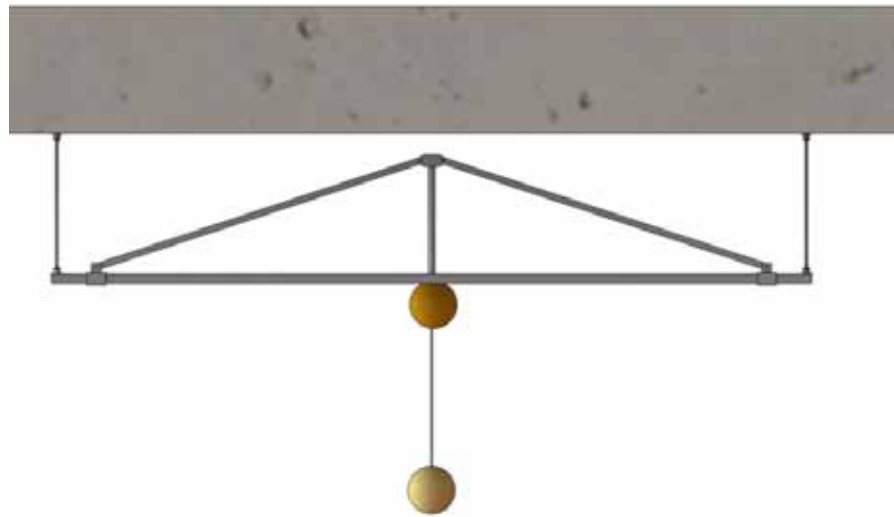
■ Frame // dimensions

Standard dimensions
suspended ceiling:
600 x 600 mm or
1200 x 600 mm

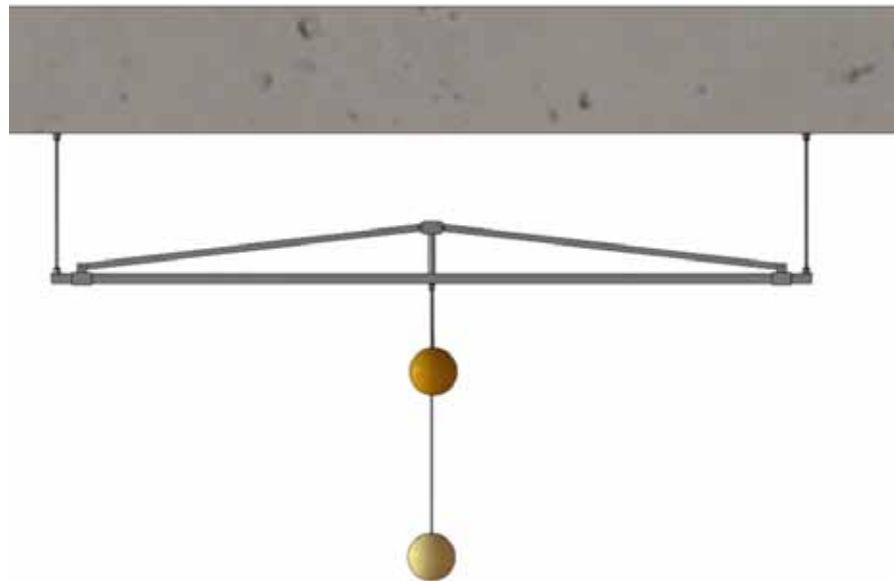
Dimensions frame:
1200 x 600 mm



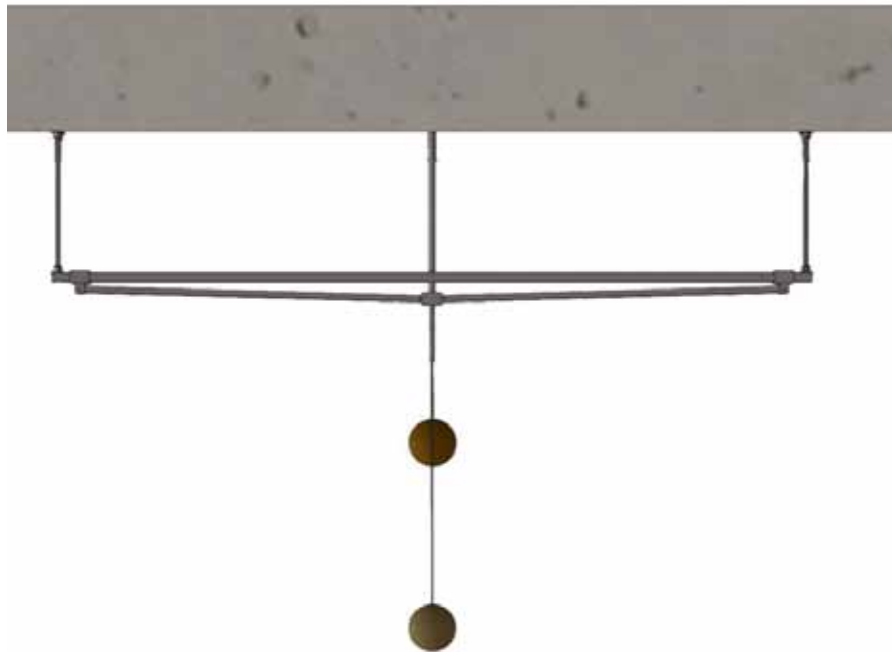
■ Frame//height



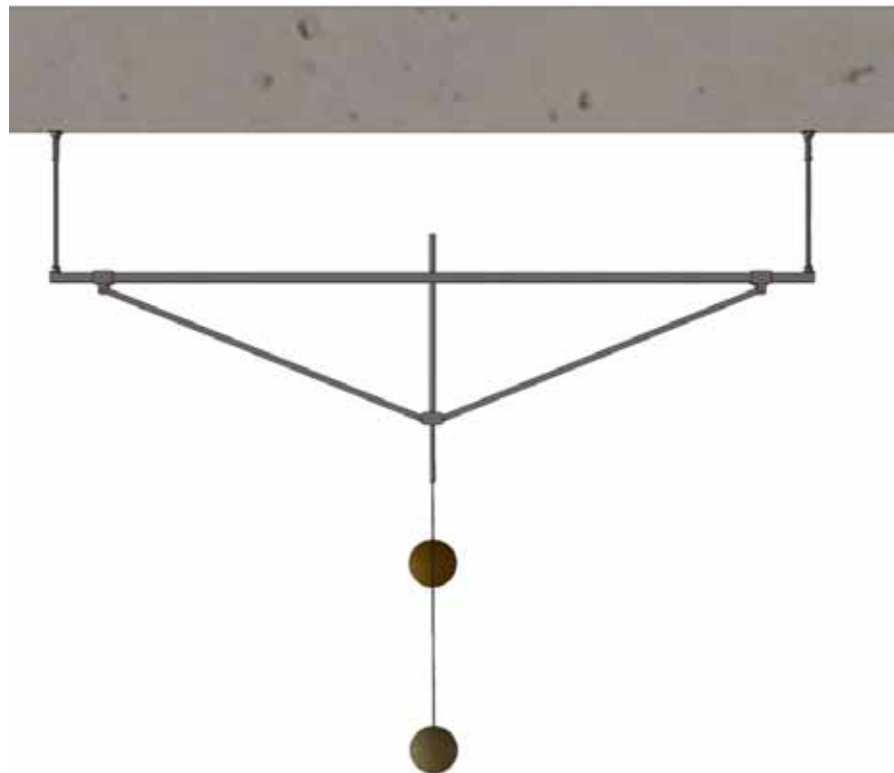
■ Frame // height



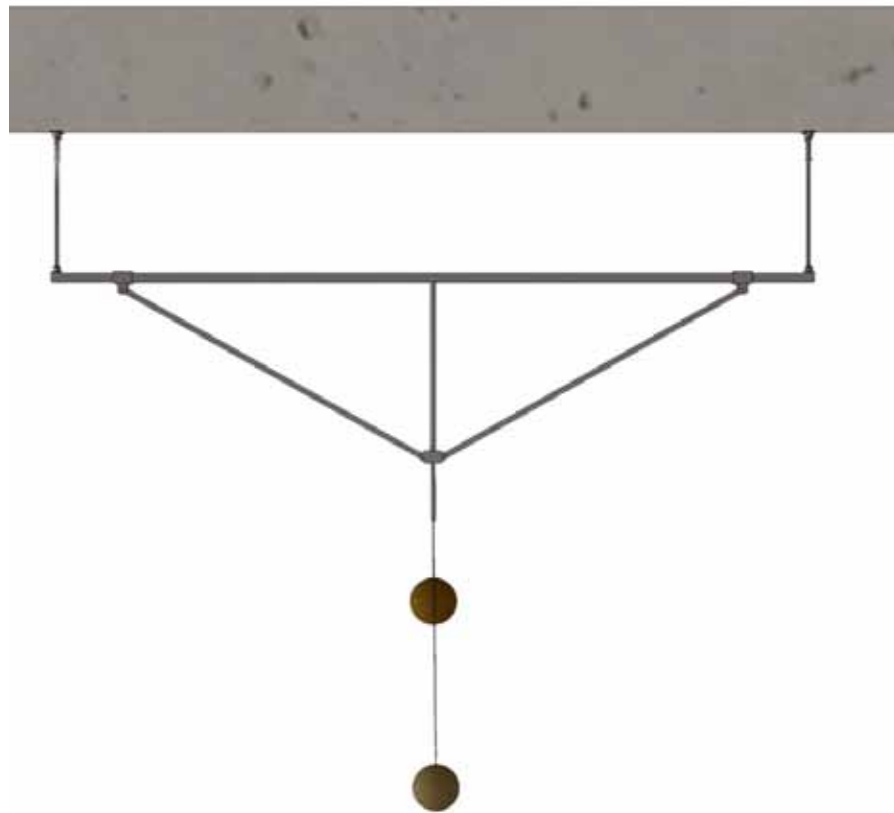
■ Frame // height



■ Frame // height



■ Frame // height

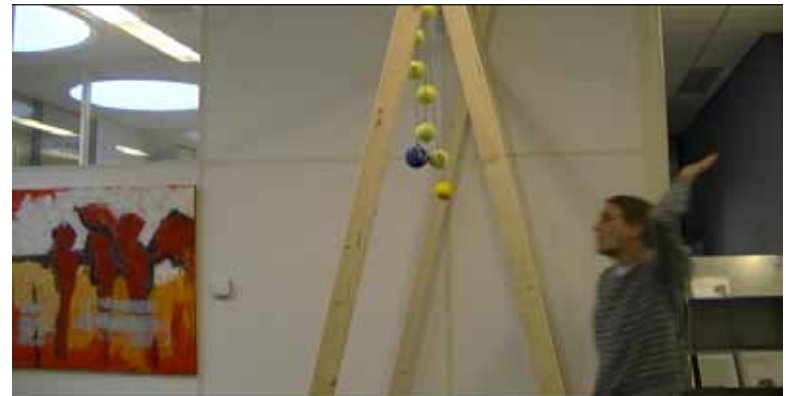


■ Ball // movement

Physiotherapists recommend this exercise for stiffness in the upper back caused by computer work



■ Ball // movement



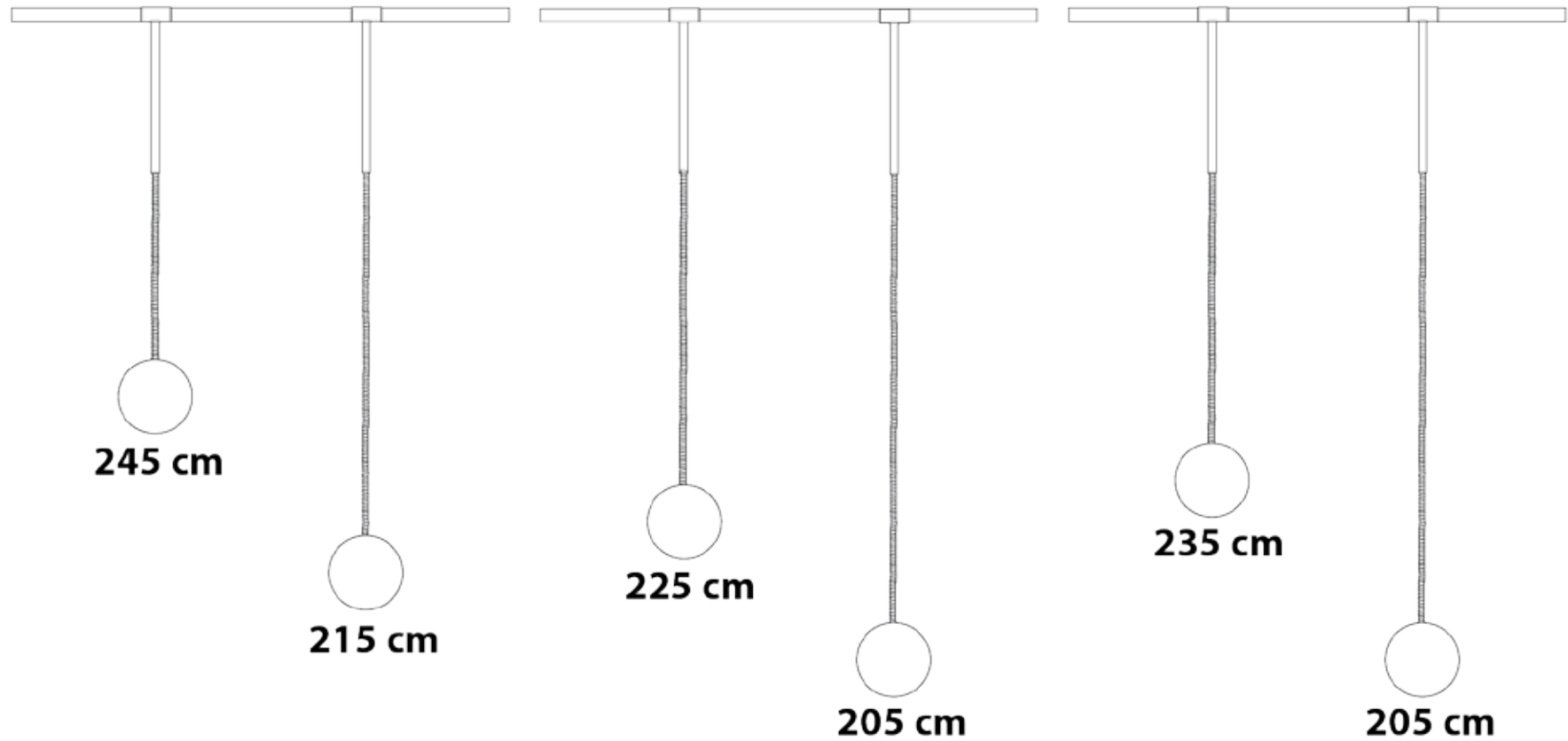
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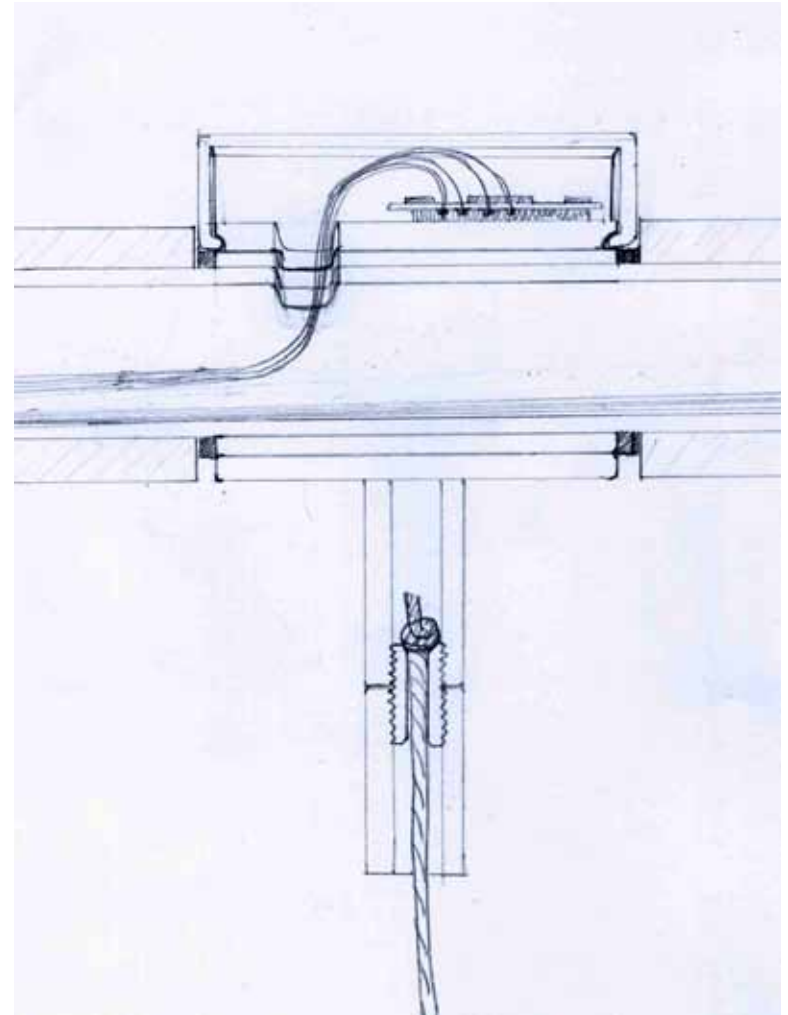
■
Recommendations

■ Balls // height



■ Screen & Sensors

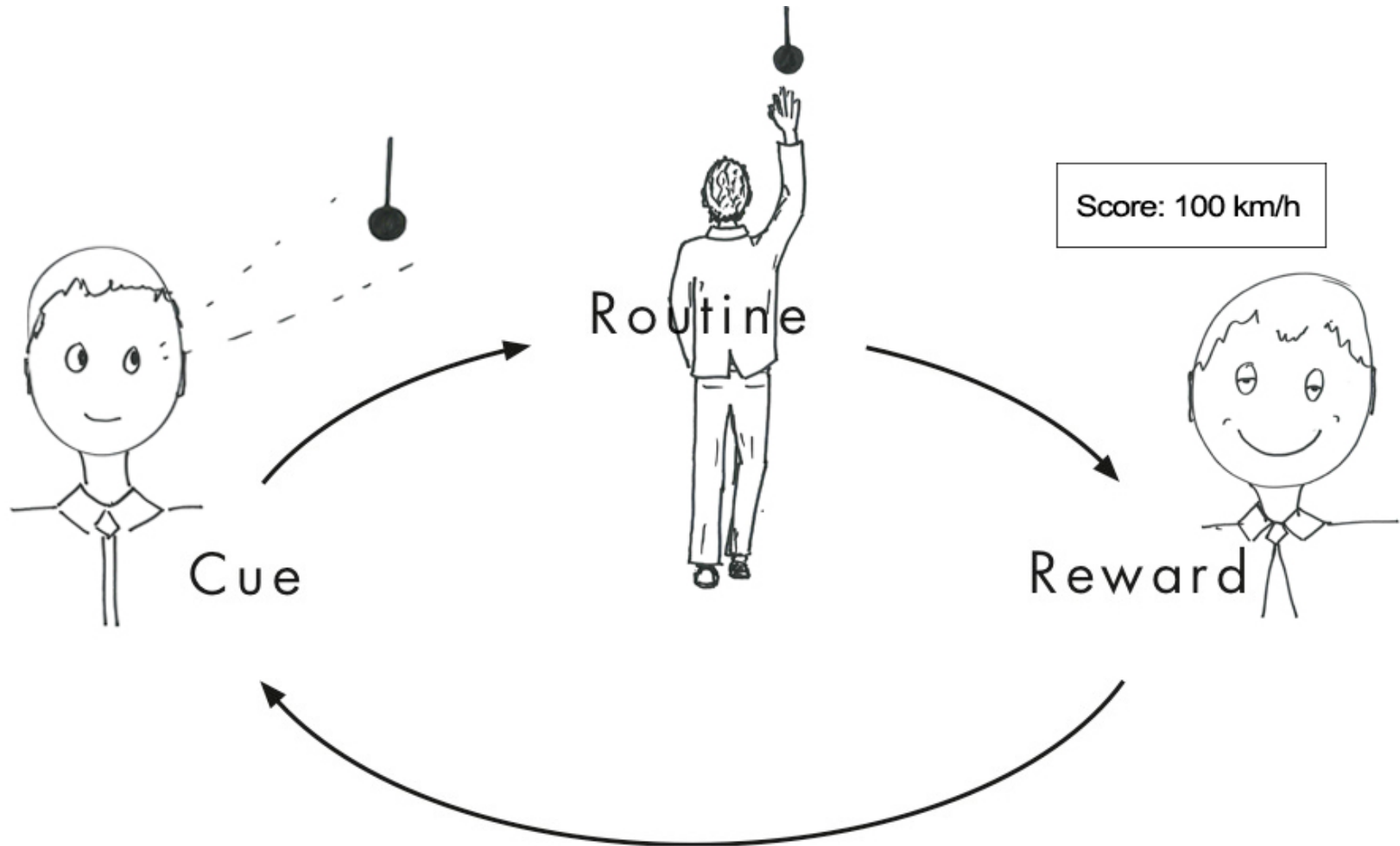
Measuring rotation speed and giving feedback



■ Screen & Sensors



■ Habit



■ Variation//waiting



■ ■ ■ ■
Context

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Petsekletser

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Evaluation

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Recommendations

■ Evaluation



■ Evaluation//testing

Center for People and Buildings

2 days

7 participants

Secret observations (webcam)

Survey afterward



■ Evaluation//results

- Ball was hit 60% of the times
- Playful, fun, nice distraction from work, easy accessible and inviting to use
- It fits the office environment
- Movement is good for the body. Stretching is appreciated.
- Score is needed to make them hit the ball. It motivates to hit the ball another time.
- They will continue hitting the ball in the future, but are not sure the score will stay interesting

■ Recommendations

- Investigate other, more challenging ways of feedback and the options to personalize the score
- Investigate the use in other offices and the long term use to see if it can become a habit and what the effects will be on the physical and mental well-being.
- Adjust the design of the scoreboard to make it fit with the rest of the design

Price



■ Concluding

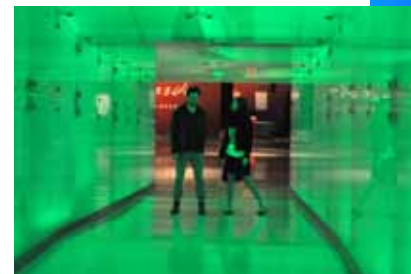
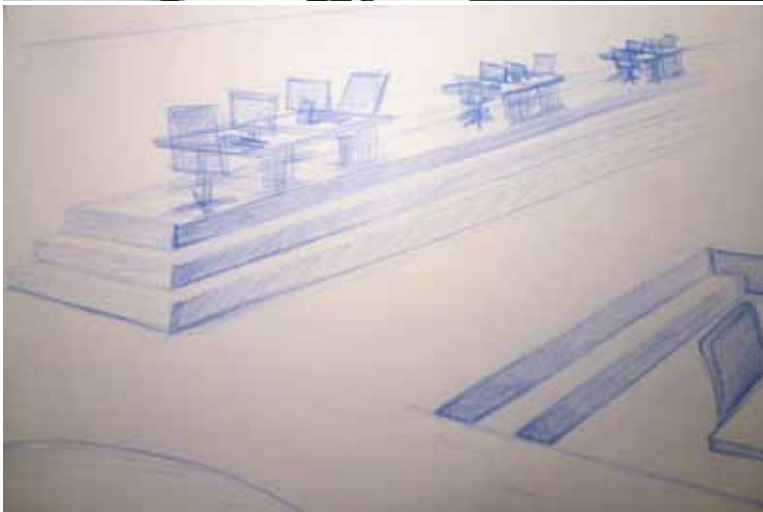
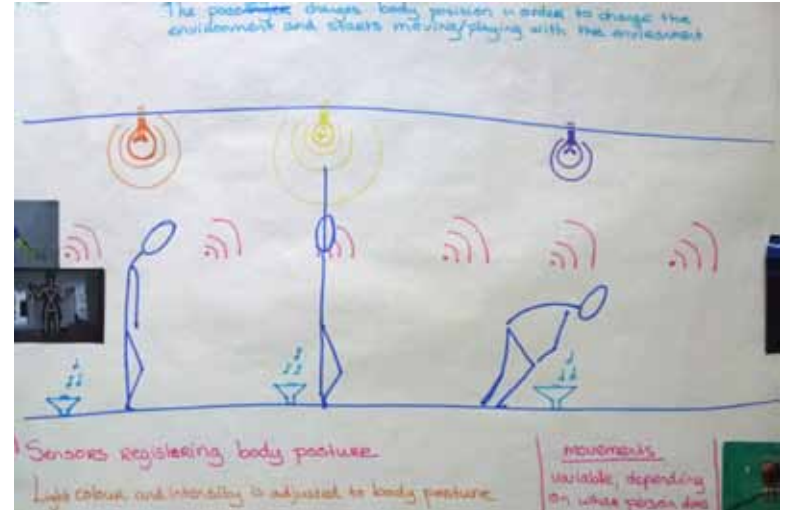


The Petsekletser brings physical activity into the office in a subtle way. It creates a more playful environment that opens opportunities for other products that stimulate physical activity.

■ Industrial Design

“Creating products people love to use”

■ Ideas



■ ■ ■ ■ ■
Context

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Petsekletser

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■ Ideas



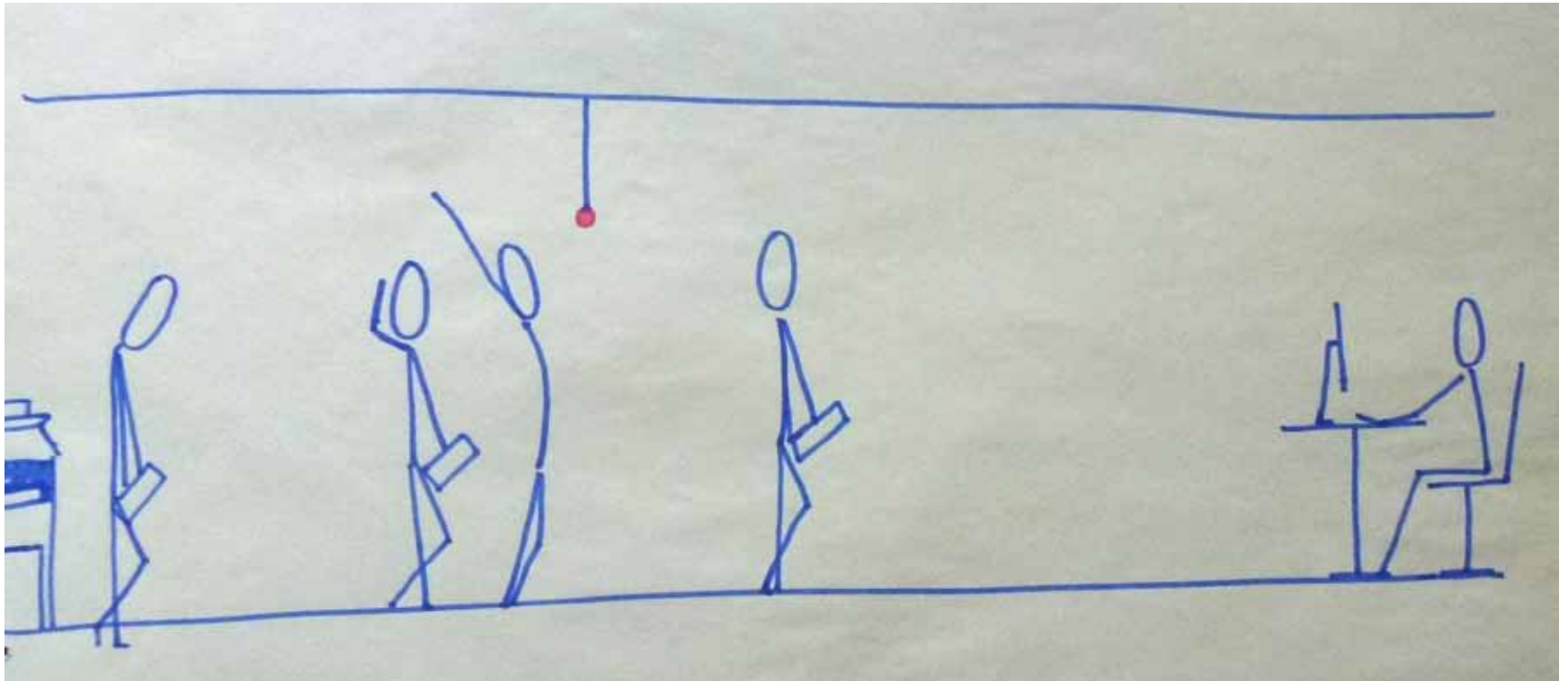
■ ■ ■ ■ ■
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Recommendations

■ Ideas



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Petsekletser

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■ Cost calculation

		Price per Petsekletser*		Reference
<i>Raw materials</i>				
	Total length per product (m)			
	Aluminium profiles	6,2 €	8,99	PMB list IO, TUDelft
	Aluminium tubes	1 €	0,67	PMB list IO, TUDelft
	Lycra	0,5 €	1,25	Market price - margin
Amount per product				
<i>Parts</i>				
	Ball + Cord	2 €	0,10	Alibaba
	Sensor	2 €	1,00	Alibaba
	Screen	1 €	10,00	Estimation
	Wires	- €	0,05	Estimation
	Connecting parts	- €	2,00	Estimation
	Nylon bearings	2 €	1,00	Estimation
	Hooks fabric	8 €	0,40	Estimation
<i>Processing and manufacturing cost</i>				
	Aluminium welding (machine)	€	0,40	Estimation, based on approx 4st/min and a total machine cost of 100 euros/h
	Milling frame (machines)	€	0,20	Mainly holes. This can be done quickly and is a simple machine
	Making cord-frame hinges (machines + human)	2 per product €	6,00	Because it is relatively complicated and the batch isn't too big, this is relatively expensive
	Sewing (human)	€	0,60	Simple work, 6 min/st, paying 6 euro/h
	Impregnation fabric	€	0,50	Doesn't cost much work, so mainly the spray itself needs to be payed
	Assembling (human)	€	1,00	Assem. Time 10 min/st, paying 6 euro/h
	Transport and distribution	€	1,00	Estimation
<i>Development investment</i>				
	Product (including getting CE certificate)	€	4,00	Assuming it will take 250 hours to develop it further in The Netherlands (paying 80 euros/h)
	Electronics	€	0,40	Assuming it will take 25 hours to develop it in The Netherlands (paying 80 euros/h)
Total production price				
		€	39,56	
Retail price				
	margin of 2,5	€	98,90	
Installation cost				
		€	200,00	eenmalig

*Strongly dependent on the amount of products and where it will be made. Let's say in first place 5000 pieces will be made in China

■ ■ ■ ■
Context

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Petsekletser

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■ Construction balls



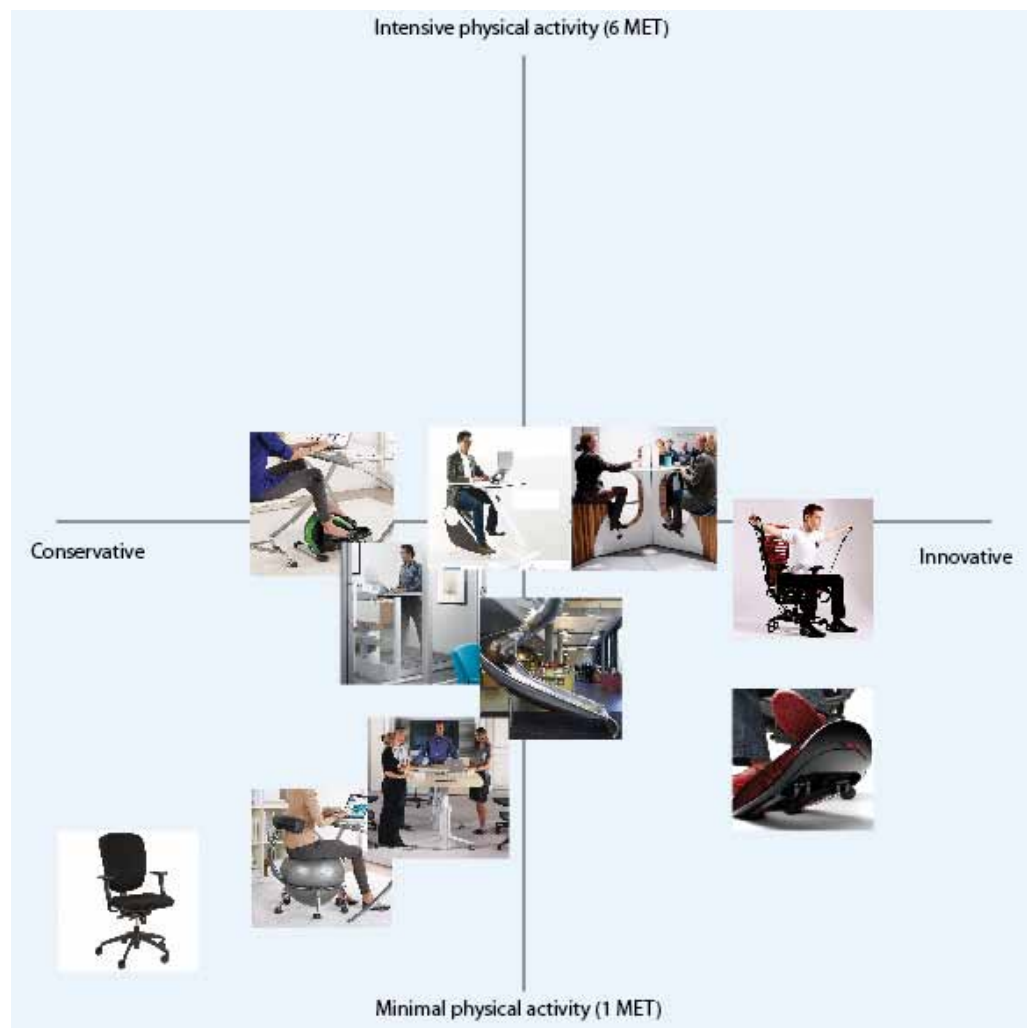
■ ■ ■ ■
Context

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Petsekletser

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Evaluation

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Recommendations

Other products



Context

Petsekletser

Evaluation

Recommendations

■ User study

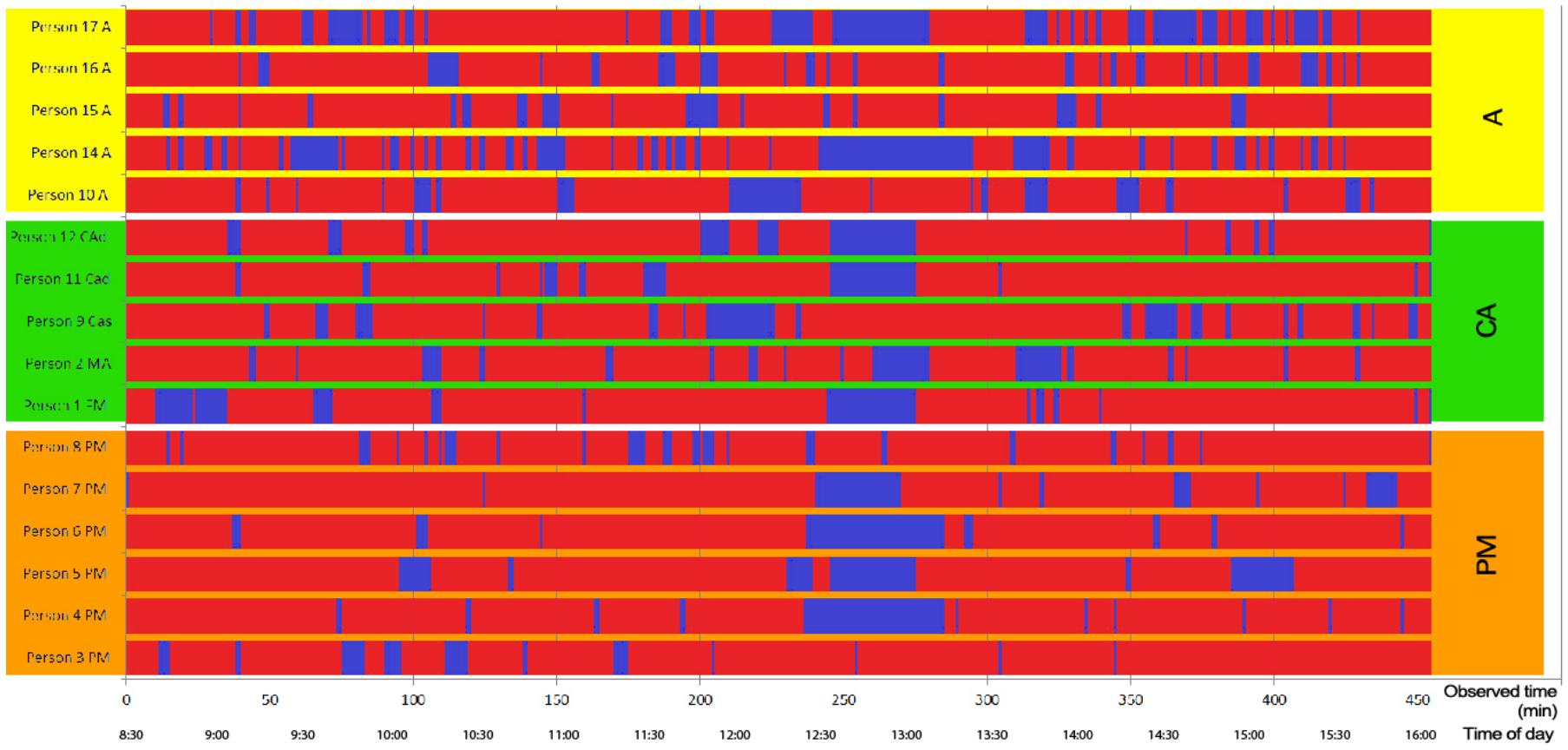


FIGURE 1 PERSONAL PHYSICAL ACTIVITY PROFILES OF THE SUBJECTS, GROUPED PER FUNCTION

■ User study

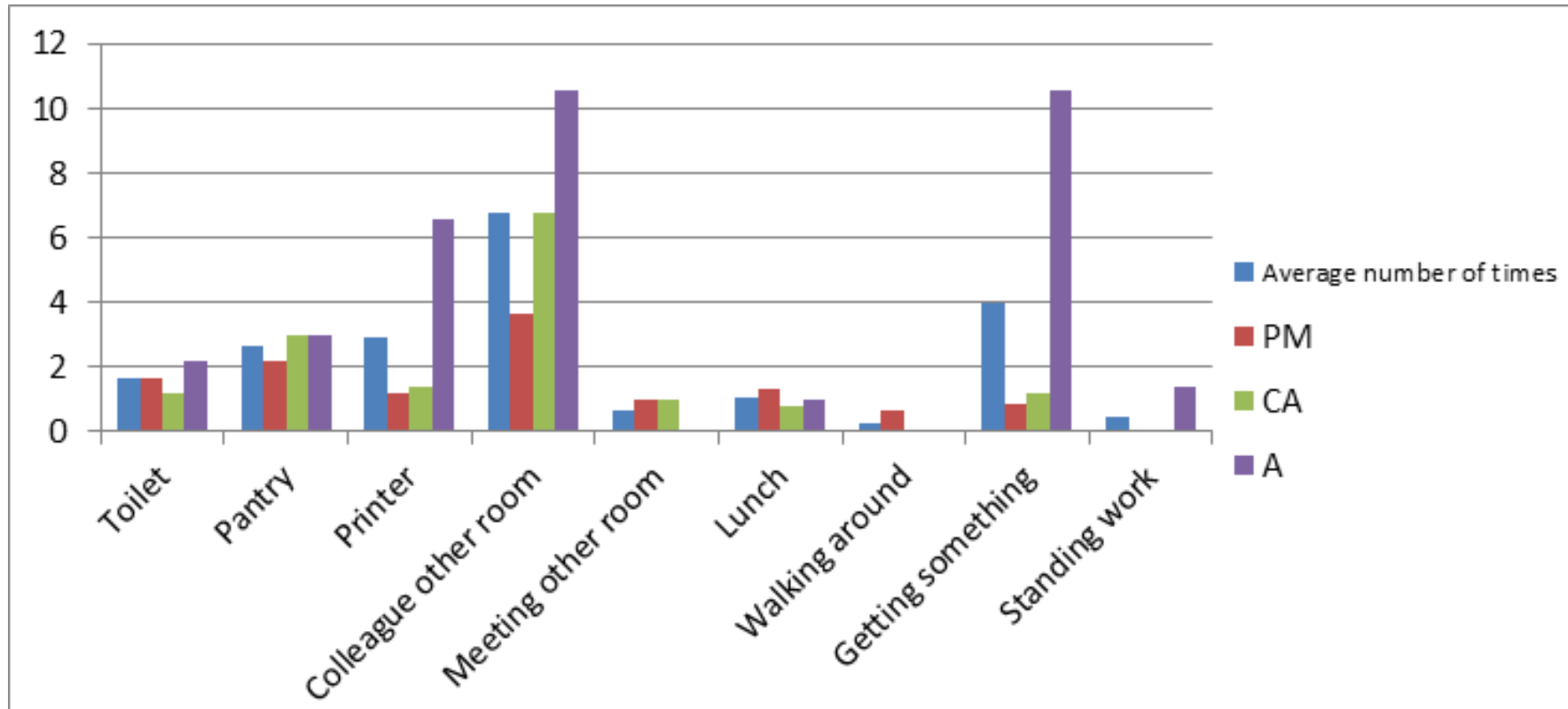


FIGURE 3 DISTRIBUTION OF TASKS

■ First experiment



■ ■ ■ ■
Context

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Petsekletser

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Evaluation

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Recommendations