The Impact of Interface Animation on the User Experience:

Directing Customer’s Attention in Online Shopping Sites

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Research Problem

- **Problem:**
  - too much information online, directing and maintaining attention is difficult (Crawford, 2015)
  - distracted attention affects online shop providers
  - an average of **69% of all online shop visitors leave their shopping cart before fulfilling the purchasing process** (Baymard Institute, 2017), according to Checkout Usability study by Baymard Institute

- **Possible reasons for high shopping cart abandoning:**
  - customers' attention is distracted,
  - too many providers and customers are wandering around in sites
  - products are being saved for later consideration,
  - shopping cart is used as a wish list

Research Problem

- **Attention Economy**
  - is a situation in the market, a phenomenon that affects both consumers and providers. Consumers need to find the best product or a website from loads of options available, and providers want to attract and keep consumer's attention to their products. For example, in the interface design, if it takes the user too long to find something, he will probably find it through another application (Davenport & Beck, 2001)

- **In sum:**
  - Consumers need to find and choose product from all the options available
  - Providers want to attract and keep consumer's attention to their products

Research Goal

Solution:

- Some issues can possibly be solved through design changes
  (like adding **functional animation**)
- **Functional interface animation** is a UX design tool that supports design solution and serves a functional and logical purpose (Daliot, 2015)

The main goal of this research is to investigate:

- **the effect of functional animation** on the user experience
- **how efficiently users solve different types of shopping tasks** in web shops
- whether or not **animations help to attract user's attention on the interactions** that have **the most importance** in fulfilling the purchasing process

Research Question

The main research question (RQ) is:

RQ: **How functional interface animation affects the efficiency of users and the user experience across different types of shopping tasks in web shops?**

The research methodology

Phase 1

Theoretical Background

Literature Review

- Aimed to understand:
  - the definitions
  - the connection of **classical animation principles** and interface animations
  - potential **animation benefits**
  - importance of **attention direction and management**

Phase 2

Theoretical Background

Exploratory analysis

Phase 3

The Experiment

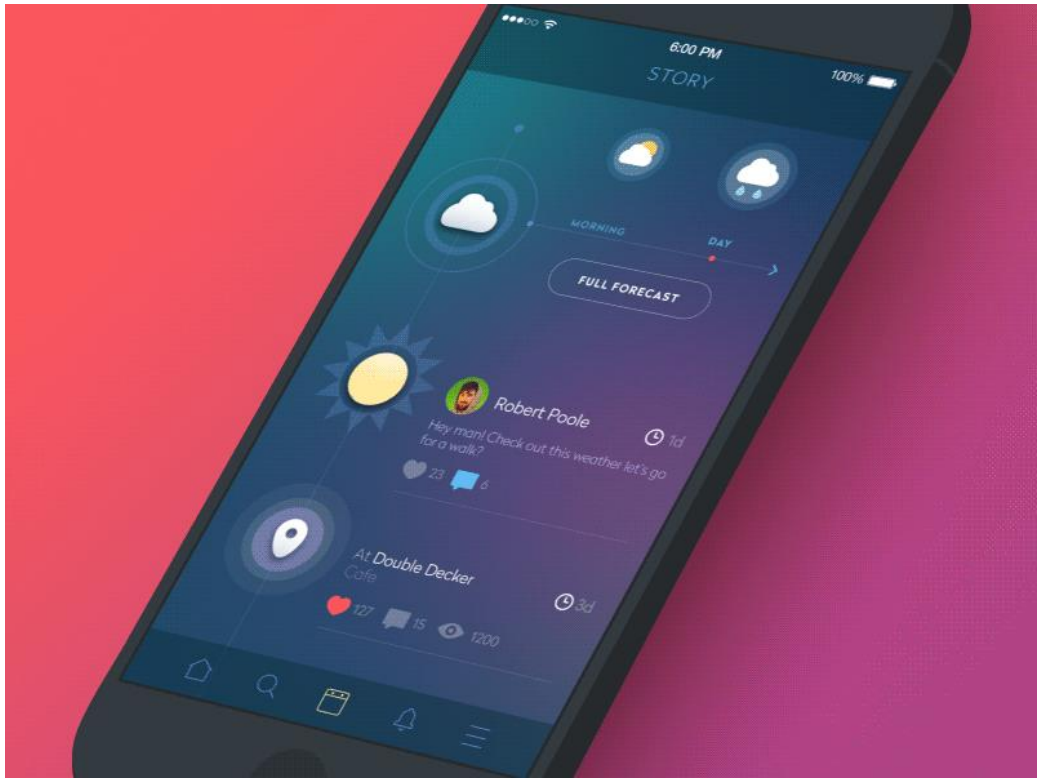
Experimental A/B Test,

a study of user preference

(Phase 1) results

Main results gathered from the literature:

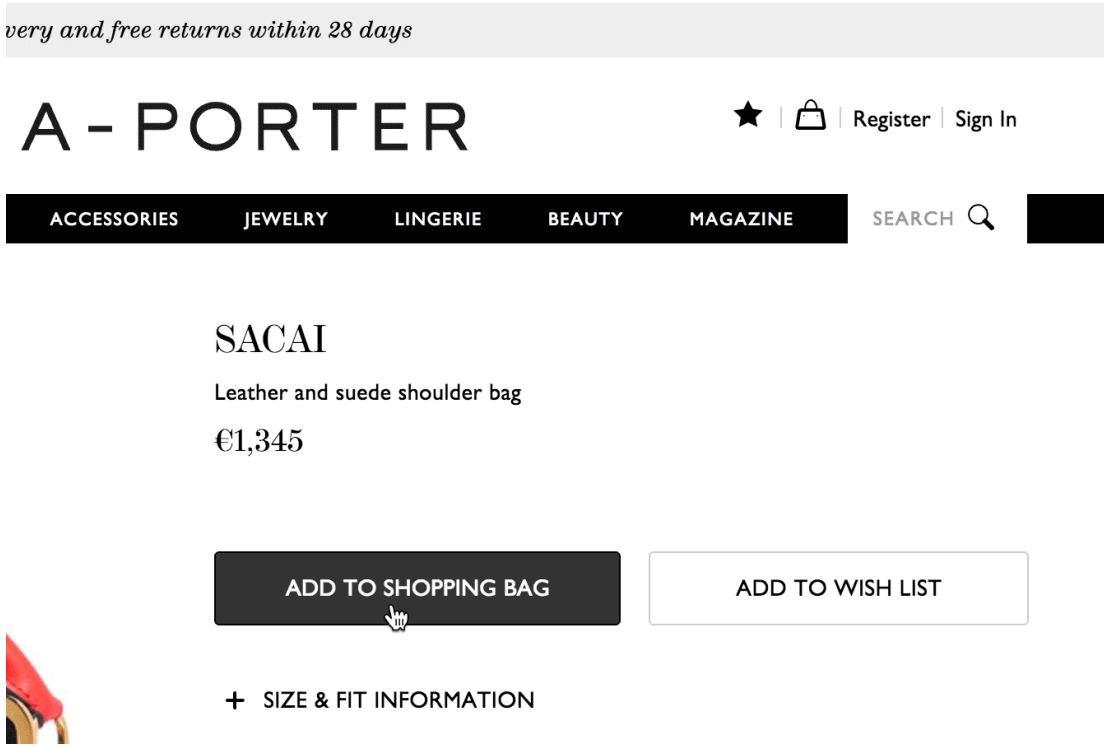
1) **Interface animations have strong connection with the classical animation principles** (Johnston and Thomas, 1981)
   - **Classical animation principles** from Disney area are timing, easing, squash and stretch, overlapping action etc.
   - **Functional interface animation implemented in UI design** are used for functional purposes



(Phase 1) results

2) **Animation usage benefits:**
   - reduces cognitive load
   - helps to reduce change blindness
   - helps to communicate
   - attracts attention and directs focus

3) **Attention managing** is extremely important in online shopping sites
   - it may reflect directly in the sales
   - user not noticing relevant changes might lead to user making mistakes and feeling frustrated. It may end up losing client and money



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Phase 2

Theoretical Background

Exploratory analysis

- **Aim is:**
  - to complement the knowledge and inputs gained in phase 1
  - **to review the current functional animation patterns** used in online shopping sites

Phase 3

The Experiment

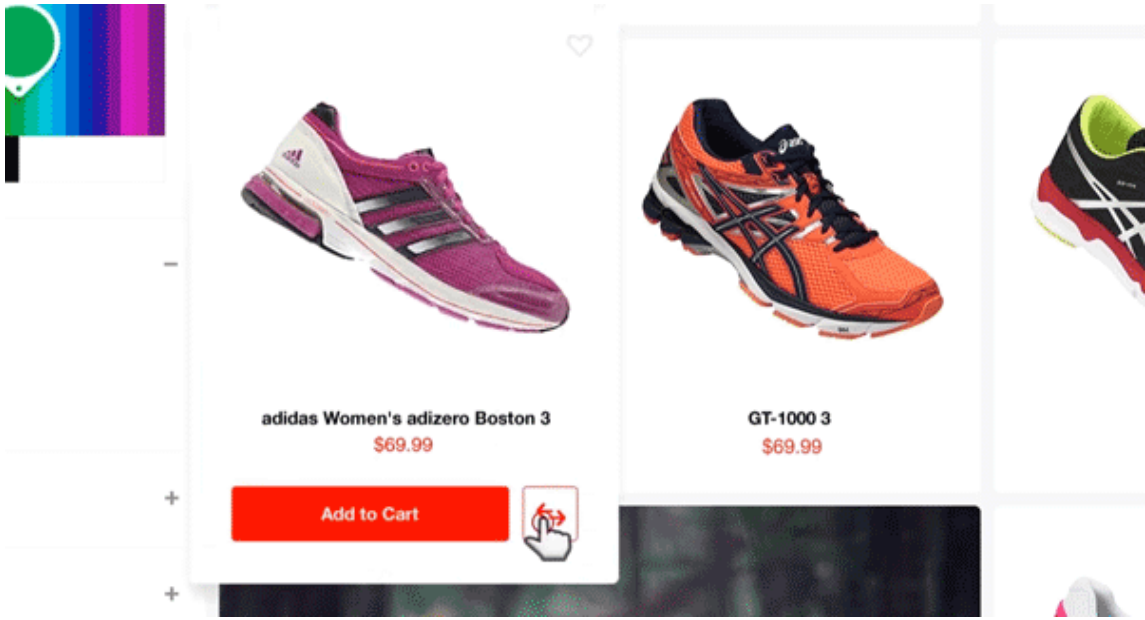
Experimental A/B Test,

a study of user preference

(Phase 2) findings

The main **functional animation patterns** used in online shopping sites:

- reveal firstly hidden information
- show user where to look next
- support interaction with clear visual response
- present disappearing and reappearing
- help user to understand the UI
- give effective error notifications



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Theoretical Background

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Phase 3

The Experiment

Experimental A/B Test,

a study of user preference

- **an experimental A/B test** aimed to:
  - understand how functional interface animation **affects the efficiency** of users and the user experience **across different types of shopping tasks** in web shops

The research methodology

Phase 1

Theoretical Background

Literature Review

- Aim is to understand:
  - the definitions
  - the connection of **classical animation principles** and interface animations
  - potential **animation benefits**
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Phase 2

Theoretical Background

Exploratory analysis

- **Aim is:**
  - to complement the knowledge and inputs gained in phase 1
  - **to review the current functional animation patterns** used in online shopping sites
  - to learn the online shopping **processes and steps**

Phase 3

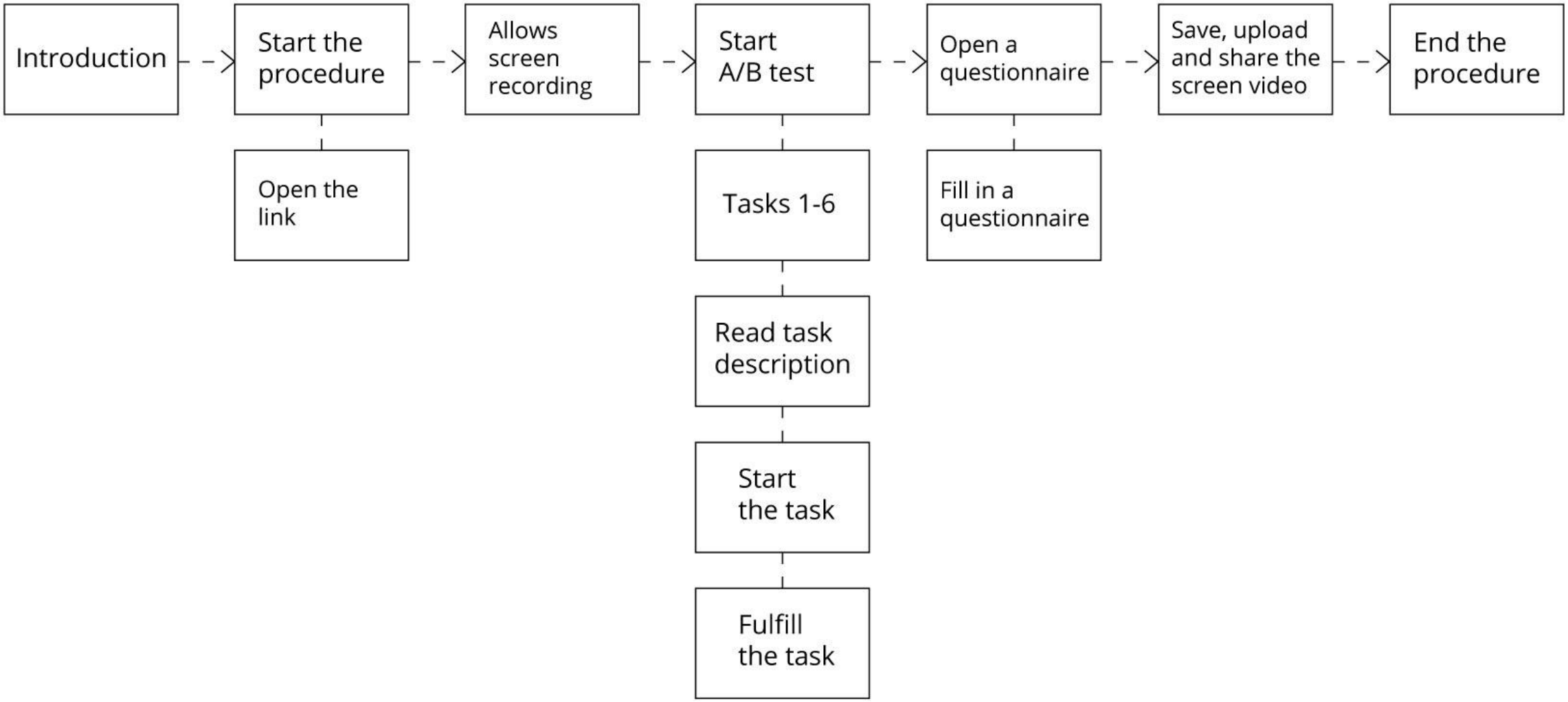
The Experiment

Experimental A/B Test,

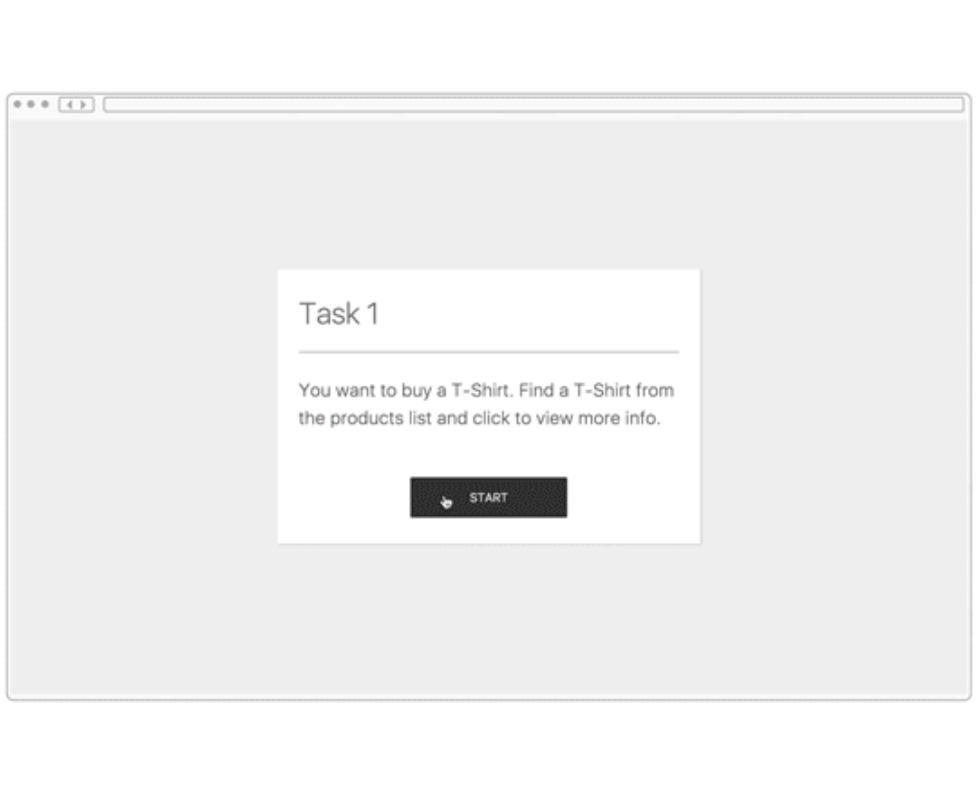
a study of user preference

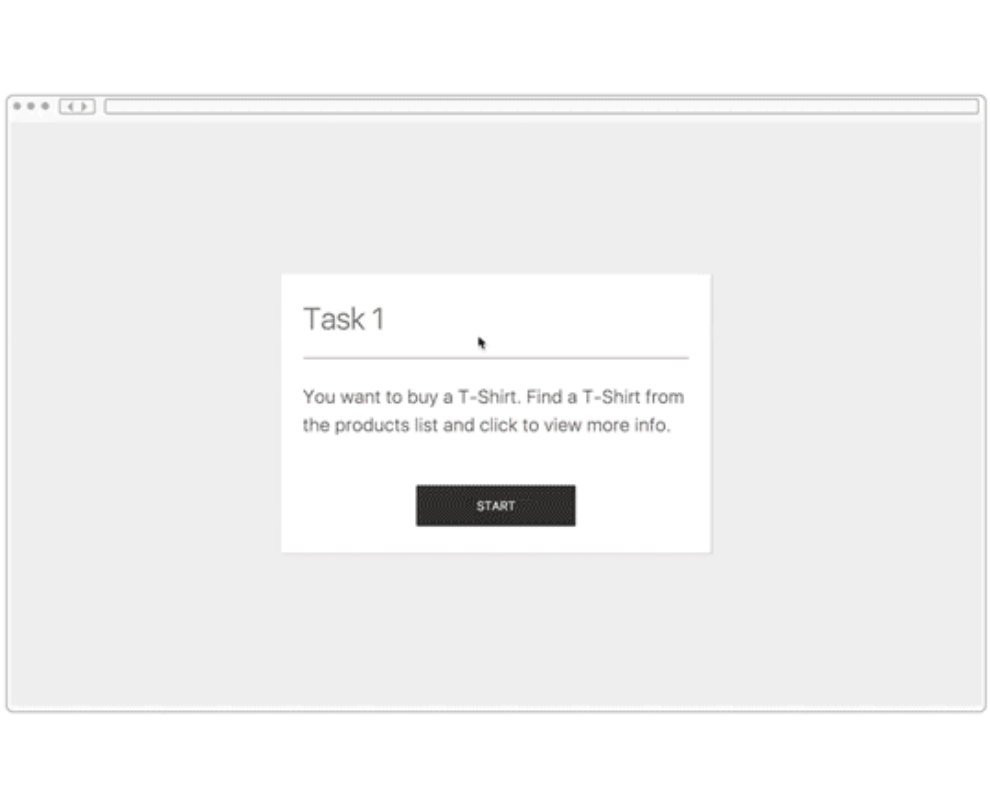
- **a user preference study** aimed to:
  - to complement above A/B test
  - to gain additional information about participants' opinions

Procedure


Introduction
Start the procedure
Open the link
Allows screen recording
Start A/B test
Tasks 1-6
Read task description
Start the task
Fulfill the task
Open a questionnaire
Fill in a questionnaire
Save, upload and share the screen video
End the procedure

The task example





Participants

- 40 participants in total
  - 20 test with animation
  - 20 without
  - Participants were randomly assigned into 2 groups
- Background information:
  - Mostly working full time and university students
  - Nationalities:
    - Estonian
    - Portuguese
    - Syrian
    - Ukrainian

The study data analysis

	Task 1 performed by Group A (without animation)				Task 1 performed by Group B (with animation)			
Participant nr	**Task 1 start time**	**Task 1 end time**	**Task 1 duration**	**Task 1 clicks amount**	**Task 1 start time**	**Task 1 end time**	**Task 1 duration**	**Task 1 clicks amount**
1	00:00:35	00:00:48	**00:00:13**	1	00:00:18	00:00:44	**00:00:26**	2
2	00:00:17	00:00:39	**00:00:22**	1	00:00:18	00:00:30	**00:00:12**	1
3	00:00:22	00:00:34	**00:00:12**	1	00:00:15	00:00:30	**00:00:15**	2
4	00:00:34	00:00:45	**00:00:11**	1	00:00:37	00:00:42	**00:00:05**	1
5	00:00:50	00:00:58	**00:00:08**	1	00:00:23	00:00:32	**00:00:09**	1
6	00:00:45	00:00:51	**00:00:06**	1	00:00:44	00:00:50	**00:00:06**	1
7	00:00:04	00:00:15	**00:00:11**	1	00:00:05	00:00:09	**00:00:04**	1
8	00:01:01	00:01:18	**00:00:17**	2	00:00:07	00:00:14	**00:00:07**	1
9	00:00:34	00:00:47	**00:00:13**	2	00:00:15	00:00:24	**00:00:09**	1
10	00:00:12	00:00:17	**00:00:05**	1	00:00:58	00:01:10	**00:00:12**	1
11	00:00:20	00:00:27	**00:00:07**	3	00:01:34	00:01:40	**00:00:06**	1
12	00:00:22	00:00:26	**00:00:04**	1	00:00:24	00:00:30	**00:00:06**	1
13	00:00:20	00:00:28	**00:00:08**	1	00:01:20	00:01:32	**00:00:12**	1
14	00:01:28	00:01:36	**00:00:08**	1	00:00:34	00:00:40	**00:00:06**	1
15	00:00:38	00:00:47	**00:00:09**	1	00:00:22	00:00:27	**00:00:05**	1
16	00:00:57	00:01:15	**00:00:18**	1	00:02:51	00:03:01	**00:00:10**	2
17	00:00:27	00:00:31	**00:00:04**	1	00:00:48	00:00:56	**00:00:08**	1
18	00:00:32	00:00:38	**00:00:06**	1	00:00:43	00:00:55	**00:00:12**	1
19	00:00:22	00:00:31	**00:00:09**	1	00:00:34	00:00:41	**00:00:07**	1
20	00:00:35	00:00:45	**00:00:10**	2	00:01:19	00:01:24	**00:00:05**	1
Mean			**00:00:10**	**1,25**			**00:00:09**	1,15
Confidence Interval at 95%				1.25 (+/- 0.235)				1.15 (+/- 0.1565)

Sum of main results achieved from A/B test

The results show that:

- adding animation to certain purchasing processes could have **some attention directing properties**

- each interaction step needs to be **separately approached** because not all added motion had a positive effect on efficiency

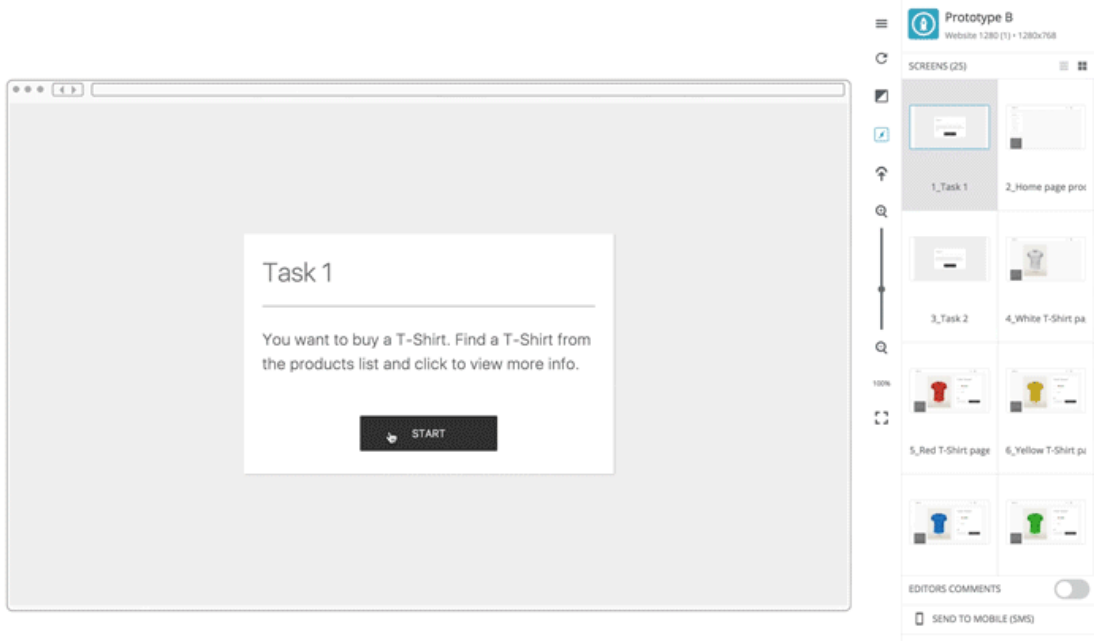
- there was some evidence, that animated elements in the interface **attract more attention and influence user's choices**

A/B test results (task 1)

- **Positive effect of animation:** in the B version of the prototype, the products quickly slid in from the bottom of the page after loading

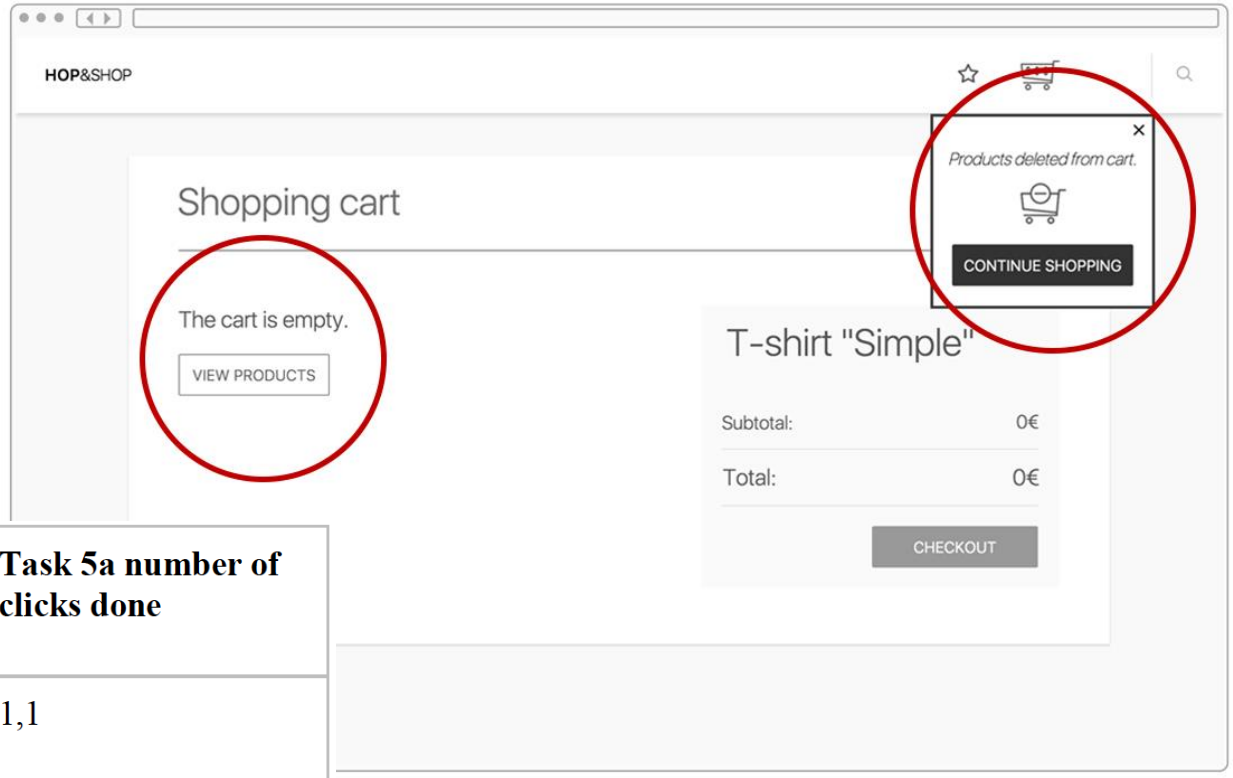
- **Motion drew possibly the participant's attention** and **indicated** where the products are located

Group	Task 1 completion time	Task 1 number of clicks done
A (without animation)	00:00:10	1,25
B (with animation)	00:00:09	1,15



A/B test results (task 5a)

- It is reasonable to use **only one animation at a time** because several animated objects might have a confusing effect on the user

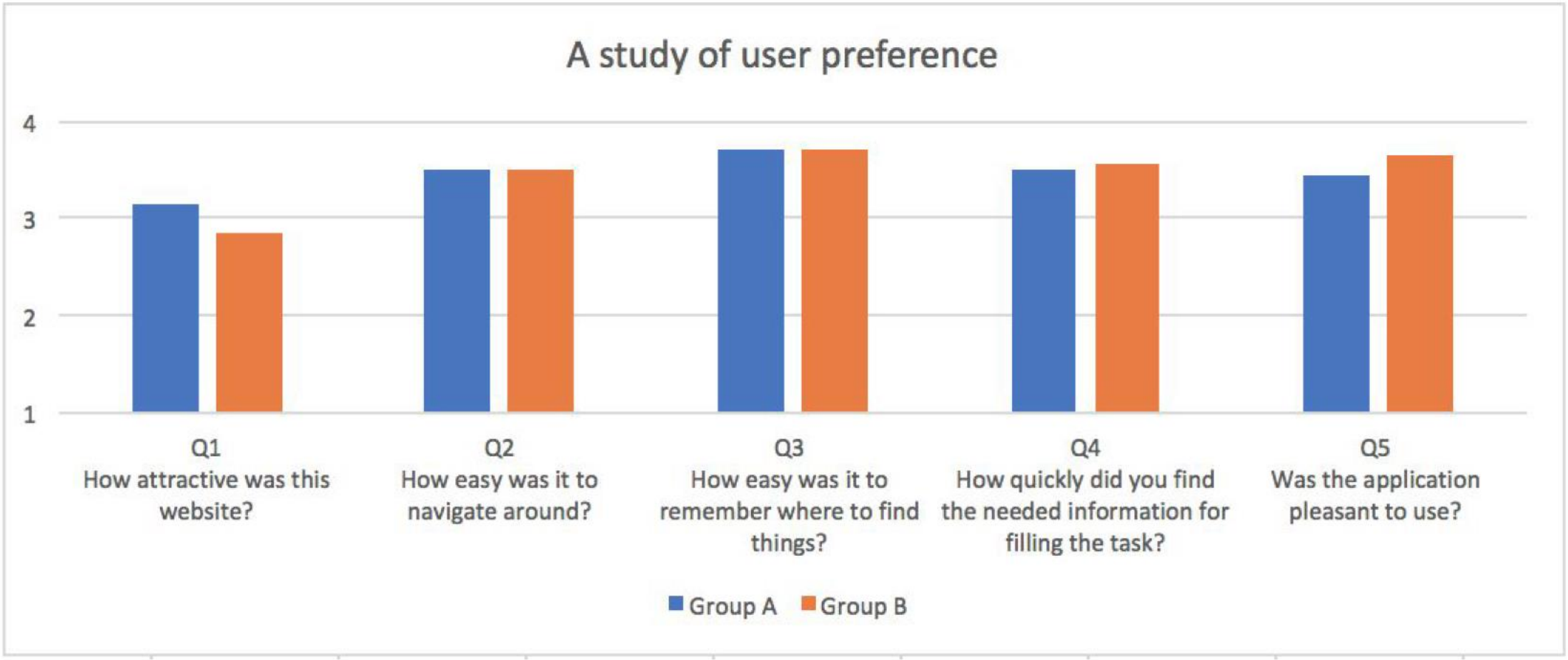


Group	Task 5a completion time	Task 5a number of clicks done
A (without animation)	00:00:06	1,1
B (with animation)	00:00:08	1,25

Study limitations

- using a prototyping program Proto.io instead of an actual Web site would
- Participants’ main focus was on fulfilling the tasks and they did not act entirely naturally
- the checkout was left out of the study

A study of user preference results



Suggestions for further research

- To explore, how would interface animations affect **the real purchasing process**

- A study could be done with A/B testing, where two or more versions of **online web shop designs**, whether with animated elements or not, would be shown to users at random. Later, the statistical data could be compared and analyzed

- Requires **good planning time-wise** and in terms of analysis methods, because it is more complicated to compare results when no certain tasks are given

Main contribution to the field

- Author brings some knowledge about interface animation usage for attention directing in online shopping purchasing steps

- The goal was to provide empirical evidence of **positive influence of functional animation** on user experience

- Work provides somewhat meaningful evidence of animation’s usage for attracting and focusing attention