Tiktok’s interface: addicting?

ANALYSIS OF THE INTERACTION BETWEEN HUMANS AND TIKTOK

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In our generation, social media is an integrating part of our daily life, but how does it actually effect us?

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REAL WORLD HUMAN-SYSTEM INTERACTION CASE

Matteo Pagliariccio

SCENARIO

IN WHICH CONTEXT DOES THE HSI TAKE PLACE?

Wherever humans have access to a mobile phone and an internet connection.

WHICH TYPE OF SYSTEM IS INCLUDED?

1. The smartphone (first level interface)
2. TikTok application in use (second level interface)
3. The recommender system for the personalized content.

WHAT IS THE PROBLEM IMPLIED IN THE HSI?

Unregulated and unconscious use of the threefold system could potentially bring out problems at every level of the interaction. We focused on the third, that of the content recommendation algorithm.

REAL WORLD HUMAN-SYSTEM INTERACTION CASE

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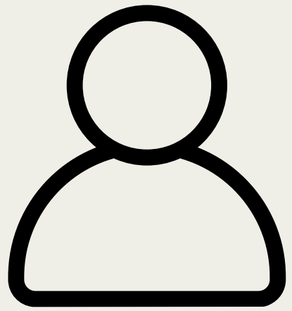
USERS

In general, anyone with a smartphone and an internet connection is a potential user.

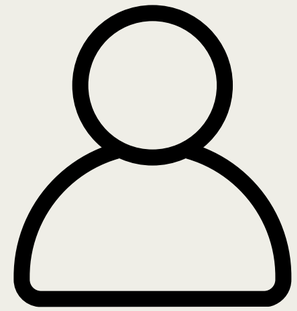
We can differentiate actual users based on the kind of use they make of the platform:

- Passive users (jargon: “scrolling”)
- Active users (jargon: “creators”)
- Indirect users (e.g. advertisers).

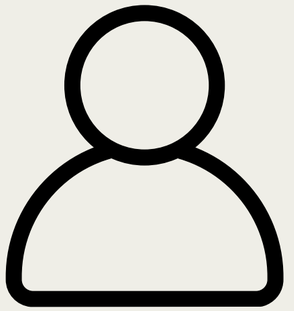
The interaction experience of some users with the platform can be multifaceted, so we restricted the sample of users to the exclusively passive ones.



Active users



Passive users



Indirect users

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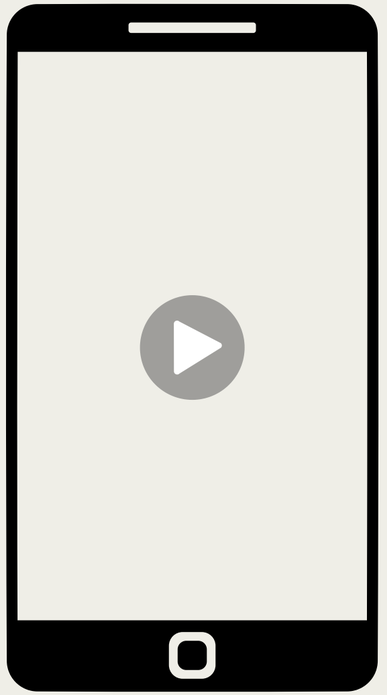
NEEDS

Users need entertainment.
At the lowest possible cost.



REAL WORLD HUMAN-SYSTEM INTERACTION CASE

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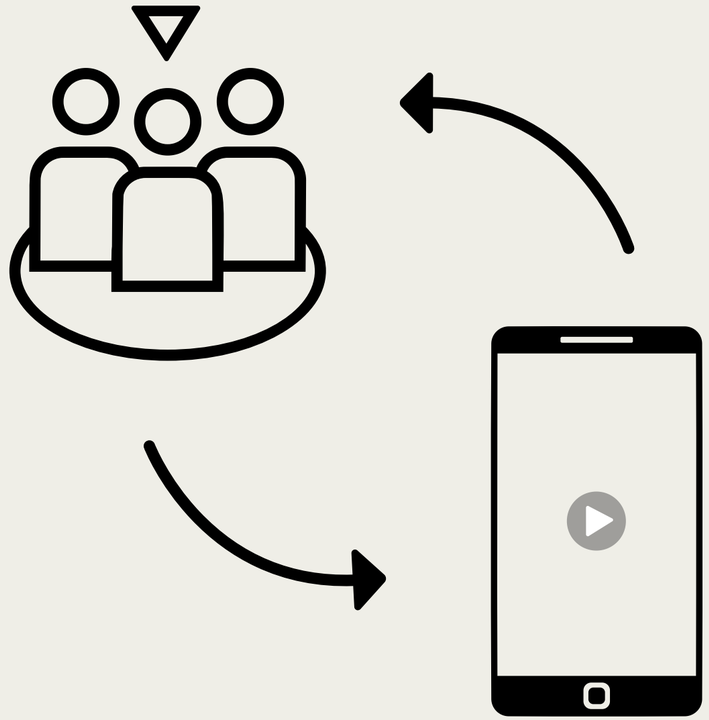
GOALS

There is a transactional kind of relationship between users and the system. Hence, these questions:

What do the users get from the system?
Exactly what they look for: low-cost entertainment.
Here, the HSI is perfectly designed.

What does the system get from the users?
Screen time. Hence more data. Hence finer tuned algorithms. Hence more screen time, which can be sold in manifold ways.

There are still unforeseen long-term consequences for the exposure to this algorithm, similar to those of an addictive behavior.



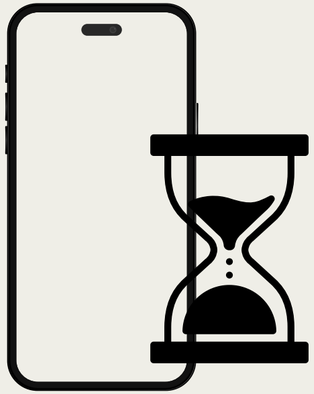
HUMAN FACTORS IMPLIED

Matteo Pagliariccio

Human factors

- **Entertainment**: a positive balance between positive and negative emotions while interacting with the app - *measure: emotional response*.
- **Cost** - *measure: cognitive workload*.
- **Screen time**: the amount of attention the users invest on the interface - *measure: the screen time itself*.

These variables entail the presence/absence of the addiction to the platform.



Role

Users seek low-cost entertainment and Tiktok offers it for “free”. Users’ screen time allows the recommender algorithm to fine tune and return the personalized content for the user, this contributes to a higher screen time.

Moreover, we believe that the increase of screen time is also due to the raise of users’ tolerance level to reach the satisfaction of the videos presented.

EVALUATION

Francesca Sotgia

METHODOLOGY

We are going to adopt a **quantitative approach,** i.e. use numerical measurements and statistics to understand phenomena.
Used to quantify the human factors and make evaluations.
Our quantitative approach is both:

- **Explicit**
- **Implicit**

Process:

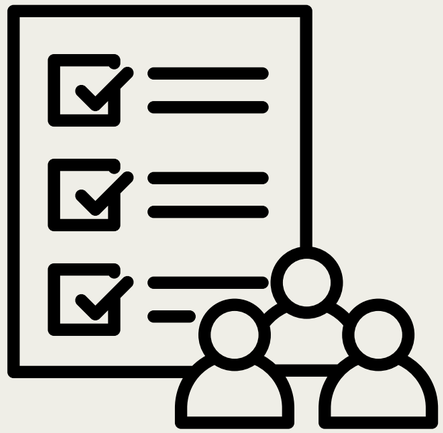
1. Designing surveys and experiments.
2. Analyze data.
3. Draw conclusions and make predictions.

Francesca Sotgia

TOOLS USED

Self-reported measures

- **PANAS (Positive And Negative Affect Schedule)**
  - Measures positive and negative emotional responses (PA&NA)
  - Questionnaires
- **NASA-TLX (NASA Task Load Index)**
  - Measures the cognitive workload
  - Questionnaires



Physiological tools

- **Cardio-respiratory analysis**
  - Measures the emotional response
  - Heart rate monitoring (electrocardiogram)
  - Respiration rate analysis (sensors attached to a belt)
- **Facial expression analysis**
  - Measures the emotional response
  - FACS (Facial Action Coding System) - identify basic emotions

Francesca Sotgia

EXPERIMENTAL SET UP

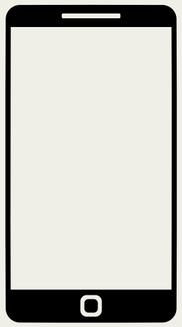
BEFORE THE EXPERIMENT

Participants must have TikTok on their phone and an internet connection.
They will be provided with the needed physiological tools:

- Portable cardiogram (EKG)
- Belt with sensors

DURING THE EXPERIMENT

Participants are asked to “scroll” through TikTok while wearing the monitoring tools.
The internal camera will film the participants’ faces and the video will be fed to the FACS algorithm later on.

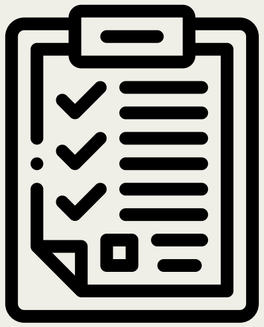


AFTER THE EXPERIMENT

The participants will have to answer two digital forms:

- PANAS
- NASA-TLX

They will have to share the statistics of their screen time.



EVALUATION

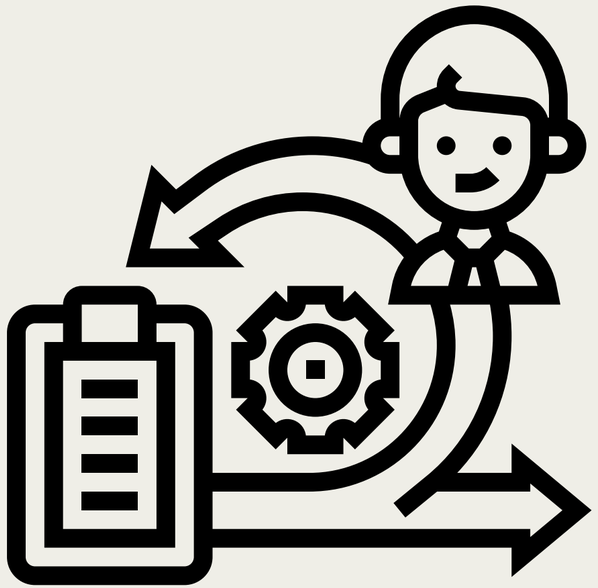
Francesca Sotgia

DATA COLLECTION
Self-reported measures

PANAS digital form
Analyze PA and NA scores to understand if participants had a pleasant or unpleasant interaction.

NASA-TLX digital form
Analyze perceived cognitive workload to understand the task's demands and the subject-task interaction.

Screen time history
Analyze the screen time to capture how the emotional response changes with respect to the amount of time spent scrolling.



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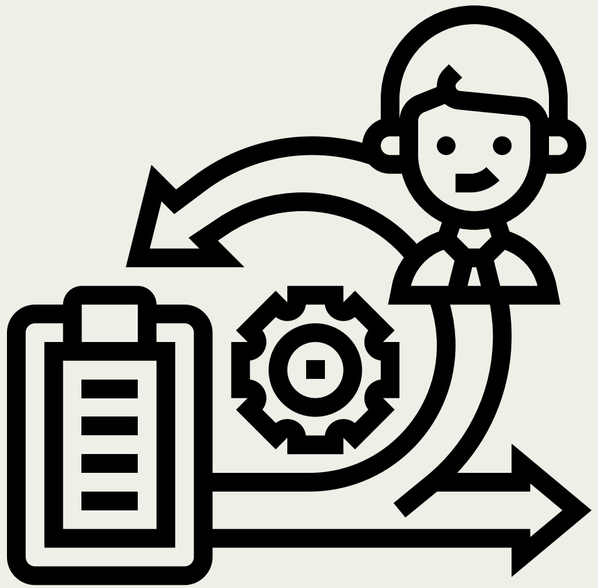
DATA COLLECTION
Physiological measures

Cardio-respiratory activity
Check how the cardio-respiratory variability is associated to emotional responses and if we can detect patterns.

Video of the participants' faces
Use FACS software to associate facial muscles movements with emotions.



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EXPECTED FINDINGS

General expectations

From the data obtained, it is expected that TikTok has an addictive effect on users, since a long use of the app leads to a:

- Higher tolerance level until “satisfaction”
- More personalized content, so higher interest in the app.

Findings:

- TikTok keeps the cognitive workload low, while making the user have a little positive emotional response.
- The recommender algorithm personalizes the content of the users’ “FYP” (For You Page) of TikTok so well that every time that the users open the app, they are even more satisfied.
- The longer the screen time is, the more profitable it is for TikTok.

Chiara Barbieri

EXPECTED FINDINGS

From the collected data

Cardio-respiratory activity
Low heart rate and low respiratory rate with respect to the resting baseline, we expect users to be relaxed while on the app. Proof that TikTok does not require a high level cognitive activity.

Video of the participants' faces
A stoic face for most of the time during the interaction of the users with the app, except for a hint of different emotions once in a while.

PA score and NA score from the PANAS digital form
A higher PA score with respect to the NA score, but with a slight value difference.

Cognitive workload average from the NASA-TLX digital form
A very low cognitive workload, since the app does not require effort.

Screen time history
Low use of the app when downloaded, with a steady increase of the screen time.

Chiara Barbieri

ACTUAL FINDINGS

For the sake of the credibility of the study, even if in a different experimental set up, a form replicating the PANAS questionnaire was sent to 56 people.

RESULTS

+ PA = 10.780

— NA = 9.480

As expected, the PA score is higher than the NA score, but with a slight value difference.

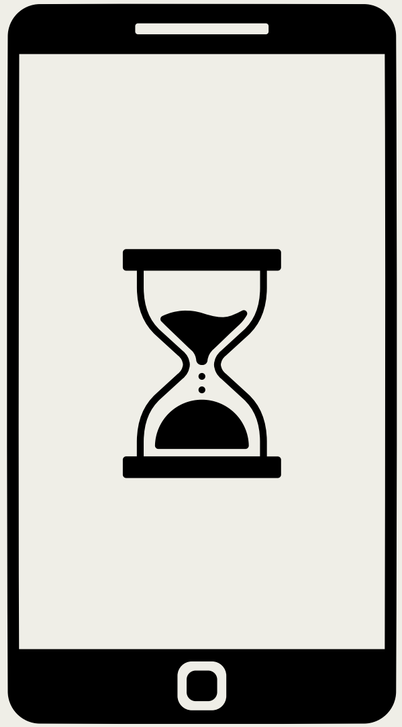
Chiara Barbieri

PRACTICAL IMPLICATIONS

Possible changes in the interface

The screen time could be reduced by creating more awareness:

- Every 15 minutes of use of the app, a screen block could be activated showing:
  - how many videos the user has watched
  - how much time the user has spent on that day on the app
- The user should have the possibility to put a time block on the app. Once the time block activates, the only option will be to close the app.



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PRACTICAL IMPLICATIONS

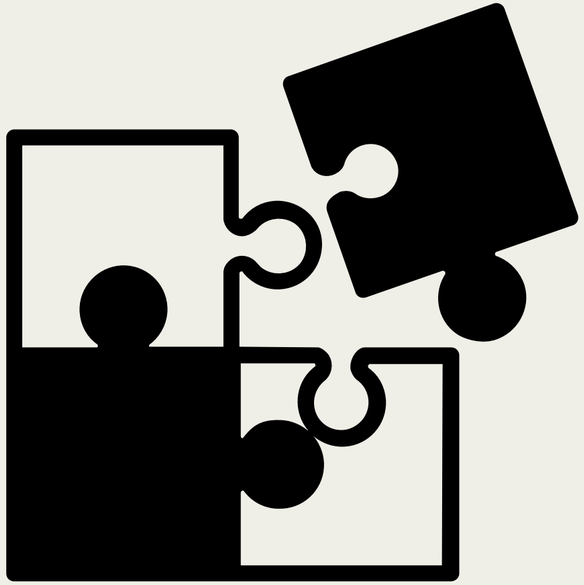
Broader impact of the evaluation

The results can be utilized to raise awareness about the impact of the app on the users.

Considering that an excessive use of TikTok clearly provokes:

- an unconscious addiction in the users
- prevents them from doing activities that are more stimulating intellectually

it is of utmost importance to make the users aware of what effects the app has on them, both on the short-run and the long-run.



INDIVIDUAL CONTRIBUTION

1. Real world Human-system interaction case ***(Matteo Pagliariccio)***
    1.1. Scenario
        1.1.1. Users
        1.1.2. Needs
        1.1.3. Goals
2. Human factors implied ***(Matteo Pagliariccio)***
3. Evaluation ***(Francesca Sotgia)***
    3.1. Methodology
    3.2. Tools used
    3.3. Experimental set up
    3.4. Data collection
        3.4.1. Self-reported measures
        3.4.2. Physiological measures
4. Output ***(Chiara Barbieri)***
    4.1. Expected findings
        4.1.1. General expectations
        4.1.2. From the collected data
    4.2. Actual findings
    4.3. Practical implications
        4.3.1. Possible changes in the interface
        4.3.2. Broader impact of the evaluation

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Q&A

Thank you!

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