Ethical Personalisation Act 2025

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Abstract. "Personalised search means nearly every result returned within a browser is altered one way or another. It's rare that two different people on Earth ever see the exact same set of search results.[1]" This paper looks at the ethical implications of personalisation in the context of information filtering systems. For example, how is media content filtered online and made available to users by the use of algorithms? Currently this is done by social media, search engines and commercial players like Amazon, Netflix and Spotify. At this time, personalisation has been explored in the contexts of marketing, information systems and human–computer-interaction. How-

1 http://moz.com/blog/the-ethical-issues-of-personalisation-online

ever, the current problem is that the personalisation filters bias the content we see, and little is known about whether a 'good' result from the user's or search engine's perspective also reflects the greater good. This research gap leads to our research question, with which we broaden the examination into the future: "What is ethical personalisation in the context of information filtering systems in 2025?" Our premise is that personalisation increases, and more personal data, such as emotional state, are used in the future in order to make personalisation even more relevant. Moreover, we claim that algorithms replace the human factor in gatekeeping. We also claim that ethical personalisation benefits all stakeholders. In conclusion, we present the ethical code of personalisation.

Keywords: personalisation, ethics, information seeking, information filtering, user context, serendipity

1. Introduction

This chapter looks at one of the current main trends and its implications: big data and the datafication of our lives. The amount of information increases exponentially, and it is becoming increasingly challenging to find the needed or desired content. To aid people in finding the relevant information, companies have developed automatic algorithms that shift through the vast amounts of data, pick a relevant subset, and present only that subset to the user. These filtering algorithms utilise the user's personal data, thus making the filtering personalised. E-commerce sites use recommendation systems to recommend certain products to users, social media sites filter their users' news feeds, and search engines personalise the search results. However, bringing clarity into the information flood is not without implications. Personalised information filtering shapes information flows, and this shapes what we know and can have wide-ranging practical implications: for example, who we meet and what we do. A general awareness of personalisation and its implications is still lacking among end-users, and there has not been open discussion about what the end-users want and allow.

Eli Pariser raised questions about the power of algorithms and their effect on our lives in his book *The Filter Bubble* (2011). In academia, this topic has been approached among others in the following contexts: marketing (Fink Josef, 2002), information systems (Billsus and Pazzani, 2002), human–computer-interaction, Internet studies (Willson, 2013), digital media (Beam, 2013), and computer science (Garcia-Molina, Koutrika and Parameswaran, 2011; Liao and Fu, 2013). In this chapter, we continue this discussion about the ethical aspects of online information filtering by shifting the focus further into the future. We map the upcoming possibilities of information filtering what new data there will be and how it can be used and

reflect on the implications. The research question of this chapter is: What is ethical personalisation in the context of information filtering systems in 2025?

We see four main contexts in which personalised information filtering currently takes place: *search engines* such as Google where users actively search for information, *social media* such as Facebook where users can passively follow the information flow, *e-commerce* such as Amazon that offers personalised shopping services, and *news* such as News360 that offers personalised news services. In this paper, we concentrate on search engines and social media, as they include the largest and the most influential players in our everyday lives, and their agendas are not as clear as are those of news and e-commerce companies. In the case of search engines and social media, the illusion of objective and common content is still strong. We will refer to Google and Facebook, the two current undeniable giants, as case examples. Our examination focuses on the ways in which information filtering affects individuals' view on the world and how 'reality' is presented to the user. Therefore, we do not touch upon the equally important issues related to privacy; instead of the ownership of the data, we are studying the use of the data and the consequences of the use.

It is worth mentioning that our examination is affected by the political and cultural context in which we are looking at it and in which the majority of the authors of this paper have lived most of their lives. All authors of this paper live currently in a Scandinavian society in which the government protects its citizens' rights more extensively than in some other societies, for example, the United States. The cultural differences between these two Western societies might actually explain some of the tensions around the online practices and ecosystems; the giants of the online world all come from the liberal society of the United States where individuals are responsible for themselves and their worldview. In that context, it seems more culturally acceptable that one makes business at the expense of others' personal data not considering the possible negative implications, which would be illegal in the majority of European countries.

In the next section, we review the current state of personalisation. In Section 3, the implications of personalisation are discussed. In Section 4, we map the future of personalisation: for example, what new data will be used, and how will our emotions be taken into account? In Section 5, we discuss the ways to secure ethical personalisation and the responsibilities of different players, and eventually we draw up an ethical code. In Section 6, we conclude by saying that the whole ecosystem must ensure ethicality: the biggest responsibility lies naturally on the service platforms and regulators, but the pressure from the users would be the most powerful means of forcing the online service platforms to act ethically.

2. Personalisation Today

Today, personalisation is deployed into many online *information seeking* service platforms. In this section, we first present the ecosystem of those online service platforms: who the actors are and how they interact with each other. We then briefly introduce the existing filtering methods and, finally, we outline the details behind today's personalisation algorithms.

2.1. Actors

In personalised information filtering, the actor network in which personalisation takes place is increasingly complex because of the business opportunities the field offers. Scholars focusing on advertising (Evans, 2009) and information content (Willson, 2013) have different approaches to the actor network. Trying to elaborate on both views and considering the possible impacts of manipulating parties to the filtered information content, we attempt to draw a focused picture of five crucial players between which personalisation takes place: the end-users, the online service platform, the advertisers, the manipulators and the regulators. We use the concept of *online service platform* to refer to online services that carry out personalised information filtering (e.g., Google, Facebook, Amazon, or News360). Some scholars make a division between developers, platforms, and publishers, but in our actor model, they are considered to constitute the online service platform.

Fig. 1 visualises the actor network in the contexts of search engines and social network sites. Even though the platforms are different Google offering an information filter through which end-users actively search for information, and Facebook offering a social network of information flow that the end-user can follow either passively or interactively the principles regarding the ecosystem are alike.

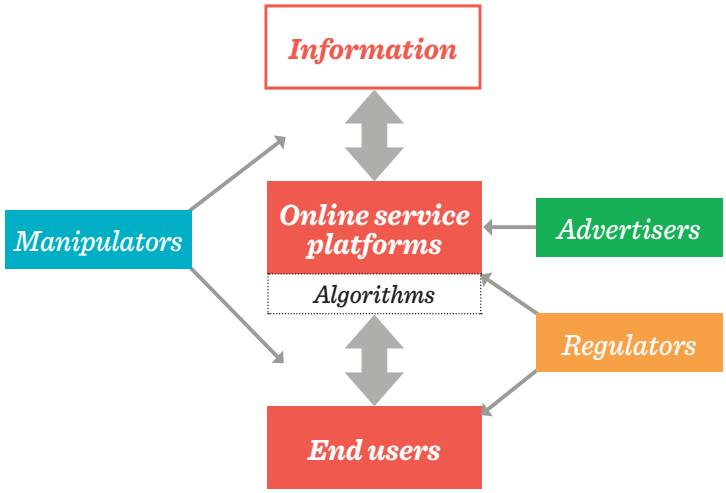

Fig. 1. ***Actors involved in information filtering.***

An *online service platform*, such as Google or Facebook, connects the *end-user* to the information, collects data from the end-users, and connects the *advertisers* to the users. As a default setting in both platforms, the end-user provides information for the *online service platform* by acting in the virtual platform. Developers that usually work for the online service platforms are constantly developing more complex algorithms and applications that aim at filtering the relevant information, based on which the resulting information chunk is delivered to the end-user. As a side product, the end-user also sees targeted advertisements that the algorithms consider relevant based on the information collected from both the end-user and the advertiser.

To provide the end-users the information filtering service for free, it is funded by advertisements. For the *advertisers*, it is relevant how many active, potential, real life end-users the platform has and how well their advertisements can be targeted to the potential end-users. This is the simplified, most powerful earning logic of the online service platforms they collect more and more precise data on an increasing amount of individuals using their service to provide the advertisers more and more precise targeting.

The manipulators can manipulate search results through legal (white hat) and illegal (black hat) search engine optimisation (SEO) actions to get better visibility or wider audiences for their products or agenda (Goodman, 2006). Companies use SEO widely to manipulate Google's algorithms (Krotoski, 2011) so that some sites gain more relevance and rank higher on the results. As a consequence of employing the so-called black hat SEO that search engines consider a violation of their terms, Google, for example, banned BMW from their listings in 2006 for a short period of time. In Facebook, the advertiser does not necessarily know the amount of genuine profiles

and whether their campaigns really reach the ones they target (Veritasium, 2014). Some firms have been accused of buying likes from click farms in order to gain visibility. Especially in the social media context, guerrilla advertising and manipulators change the rules of the game. An end-user is not necessarily capable of knowing what is content and what is ad, which likes are bought and which are not.

The *regulators* such as nations, states, courts, or global organisations should be capable of changing the rules of the game. For example, they can set laws for data collection, sharing, tracking, and personalisation in general. However, as the global development of the platforms has been rapid, the regulators that mainly exist on the national levels have not been able to react fast enough. The regulations are created on the go and are largely dictated today by commercial players, such as Google and Facebook. Thus, the long-term consequences can be radical, as individual players grow into monopolies, gain enormous amounts of information they know how to utilise, and are capable of dictating their own rules.

2.2. Personalisation Filtering Methods

Personalisation can be categorised based on the type of data used. In collaborative filtering, people's preferences are predicted by comparing their behaviour history with other people's behaviour history. For example, if person A has liked news articles 1, 2, and 3, and person B has liked articles 1 and 2 but has not yet seen article 3, collaborative filtering predicts that B will also like article 3. For collaborative filtering to work, it requires that there is enough behaviour data available. Therefore, it does not work for novel content. Another filtering method is content-based filtering, where content is analyzed and compared with a user profile that is created by a machine-learning algorithm. In our example, the algorithm could create a profile of person A based on the textual content of articles 1–3, and thus predict whether he will like article 4, which nobody has rated yet. A third method is rule-based filtering. The rules can be set by the user or the online service platform. For example, the user could set a rule that filters out all news articles written before 2010, or the online service platform could filter out all adult-themed articles from underage users. Most information filtering systems combine collaborative and rule-based filtering into a hybrid filtering method because they are easy to implement. Content-based filtering is not utilised in most fields yet, because analyzing the content is a resource-intensive and challenging task.

The above example of collaborative filtering was very simple and based only on binary "like" data. In reality, however, the current collaborative filtering algorithms use several data sources. For example, when evaluating the relevance of a new feed object for a user, Facebook uses the affinity between the creator of the object and the user, the weight of the new object, and when the object was posted. These three components are the ones publicly known about the Facebook's EdgeRank algorithm. Affinity is defined by how much the user has interacted with the creator, e.g., clicks on

links, likes, shares, and comments, whereas the weight of the object is mostly defined by its type and popularity. New objects get visibility because of their novelty and the affinity between the user and the creator. If the new object is the user's close friend's wedding photograph with hundreds of likes and comments, it will more probably appear in their news feed than a remote friend's status update with no comments or likes. The exact algorithms used by the companies are well-kept secrets, and, even though we know that Google uses GPS location data from our mobile devices, we do not know exactly how the data is used to filter our search results.

Even the goal of personalisation is not known, except for some publicly made comments that outline the goal to be providing relevant information to the user. The definition of relevance, however, is very subjective. Mark Zuckerberg has said, "A squirrel dying in your front yard may be more relevant to your interests right now than people dying in Africa." We argue that while the squirrel dying might be more engaging, famine in Africa is still more relevant. The underlying goal of the companies is to provide value to shareholders, and Google and Facebook do this using advertising. Thus, by providing engaging content to the user, the companies can maximise the time users spend using their service and are exposed to the advertising. Another, and perhaps a more substantial, benefit of personalisation is that the same data collected for personalisation can be used to target advertisements. It is clear that the users and their data have become a commodity. Now that more and more people use personalised information filtering systems to get their news, form their worldview, and create their identity, the ethics of such systems should be examined as closely as the ethics of journalism.

2.3. Personalisation Algorithms

In this section, we will discuss the personalisation algorithm at its technical perspective. The section is structured as follows. First, we briefly repeat the motivation behind personalisation in modern information-providing mechanisms, and then introduce two types of these modern mechanisms. Second, we examine available algorithm toolkits that mechanisms can utilise to recommend to users the information that might interest them. Finally, we investigate the sources of personalisation based on which the information-providing mechanisms provide effective personalised assistance.

Personalisation: A Technical Overview. The Internet has no shortage of information. The challenge is finding the right content for you: something that will answer your current information needs. At least two types of information providing mechanisms have been developed over the years to satisfy user information needs (Garcia-Molina et al., 2011):

A *search* mechanism requires that you are looking for something specific that can be formulated as a keyword query. The mechanism, sometimes called 'search engine', explicitly takes the keyword query as its input and returns a list of objects (e.g., documents, songs, movies, books) that somehow match the query. This traditional

search mechanism used to have two primary challenges that have been increasingly addressed by the modern personalised search engines. The first one is in assuming the users know what they are looking for and write a proper keyword query. Unfortunately, this is not always the case. For example, a user may not even know what to look for and end up browsing sites looking around for things that "might interest them". The second challenge is that search engines ordered their results based on the small amount of information available in the keyword query, rather than individual user interests. Thus, all users saw the same results for the same query, even if they had different interests and backgrounds. To address the two discussed issues, personalised search that takes user profile into account has grown popular during the past decade.

A *recommendation* mechanism typically does not require explicit query but rather implicitly analyses a user profile, e.g., what the user has recently read, written on Internet sites, or what the user likes, and if available, contextual information such as where the user is and what he is doing. Based on the analysis, it recommends to the user a list of objects (e.g., friends, products, movies) that may be of interest and relevant at the time.

Figure 2 illustrates a summary on the two *information-providing mechanisms* (or sometimes referred as *information-filtering mechanisms*). In the search mechanism, or the *information pull* model, the search engine explicitly takes user query as input. The engine expands the query with user interests to make a personalised query. A list of objects matching the query is then presented to the user. In the recommendation mechanism, or the *information push* model, the mechanism implicitly monitors the user's activities and constructs a user profile, based on which the mechanism automatically recommends to the user a list of objects that might interest them. In both models, there is a feedback loop that examines how satisfied the user is with the recommended information, e.g., does the user choose the first result or not? The feedback is utilised to improve the user profile for better recommendations in the future.

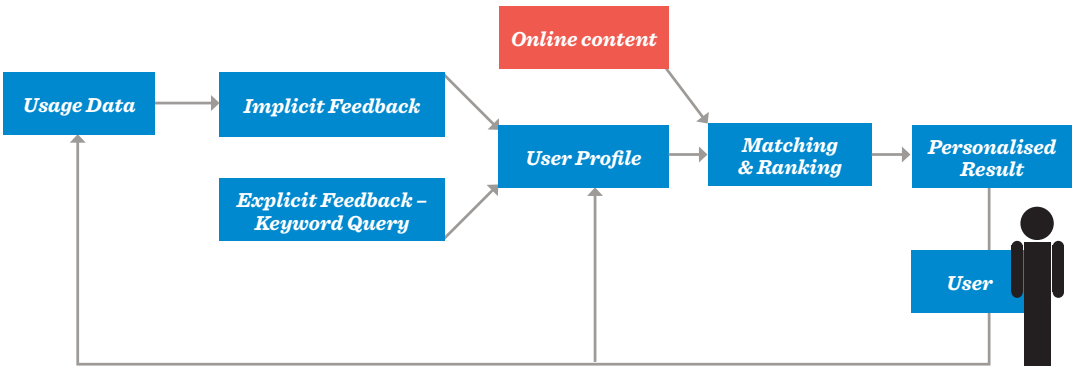

Fig. 2. ***Implicit and explicit feedback are used to learn and update the user profile used during personalisation (redrawn from Micarelli, Gasparetti, Sciarrone, and Gauch, 2007).***

Personalisation Strategies. In this subsection, we discuss how different information filtering mechanisms employ personalisation.

A *search* mechanism functions typically so that the search engine has already run the so-called *ranking* algorithm that matches a large collection of objects with the keyword query given by the users and orders the returned results. A famous ranking algorithm is the Google's PageRank algorithm that tries to measure the importance of all available websites on the Internet. PageRank defines the importance of one website as the number of URL links referring to this specific website. After that, a list of words appearing in the website is collected. If a user searches for "Apple", all the websites that include word 'apple' are collected and presented top-down based on their importance.

In reality, however, search engines are more complex. Fig. 3 illustrates three primary methods incorporating the personalisation functionality into the *search* process. In the first method (a), the search service platform extends its algorithm to take inputs as both user queries and user profile. In the second method (b), the user-given keyword query is extended with user interests. For example, a simple search "*car*" can be extended to "*car* + *second-hand* + *Helsinki*". These user interests are derived from information such as "you are middle class in Helsinki, searching for a job requiring driving license and recently browse used-car websites". The extended keyword query can then be entered to the traditional ranking algorithm, and the matching results are returned to users. In the final method (c), before the matching results are returned to users, they go through another ranking algorithm, so-called *conceptual ranking*. The conceptual ranking utilises the user profile to remove irrelevant results and reorder results in a more pleasant way to the users.

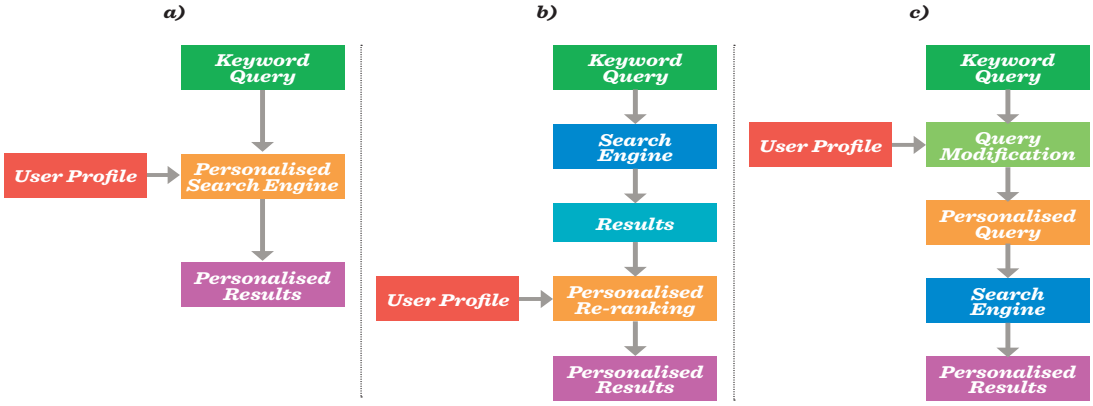

Fig. 3. ***Personalisation processes. User profile is utilised during (a) the retrieval process, (b) re-ranking or (c) before the query (redrawn from Micarelli et al., 2007).***

Recommendation mechanisms appear all over the Internet, and, in contrast to search engines, recommendation systems that utilise personalisation have been developed quite recently. Examples of services that utilise these mechanisms include an e-commerce website that can recommend to you products that might interest you, a video rental website that can propose to you movies and TV series that fit your preferences, a video hosting service that suggests to you interesting clips people are sharing, or a social networking website that lists your friends' status updates that might interest you. Recommendation systems can be broadly categorised into two types: *content-based* and *collaborative filtering*.

In the content-based systems, the similarity between items that you have rated high and a new item implies your high interest in the new item. Although content analysis is not widely used yet in personalisation, some methods use at least information about the content type. One such example is Facebook's EdgeRank algorithm. Facebook News Feed displays only a subset of the stories generated by your friends. Below is the formula of the EdgeRank algorithm, sometimes referred as *News Feed Optimisation*. The $\boldsymbol{u}$ value reflects the key concepts behind content-based systems, while $\boldsymbol{w}$ and $\boldsymbol{d}$ values are additional algorithm inputs: $\boldsymbol{u}$ is the affinity between viewing users and creators. In practice, if you send a lot of messages to someone and check their profile continuously, the $\boldsymbol{u}$ value is high and you will see more items created by that person. The information weight is $\boldsymbol{w}$. For a news item, comments have higher weight than likes. The more comments an item has, the more popular it is. Finally, $\boldsymbol{d}$ is the time when information is created. The longer time the item is, the less important the algorithm considers it.

$$\sum_{edges} u_e w_e d_e$$

In the collaborating systems, all item ratings by all users are taken into account. There are many approaches in this strategy. The most popular one is the *model-based algorithm* in which the users are modelled and grouped based on their past ratings, e.g., a group of female users who like horror movies. When an item generates interest among many users in a group, it implies that all other users in that group might find the item interesting.

User Profile. User profile construction is an important component of any personalisation systems. The user profile tells what a user is and should not be mixed with the user context, which means where a user is and what a user is doing. The user profile is usually deduced from the user's past online behaviour, whereas the user context is usually deduced from the user's *current* information (e.g., user location; the opened websites, documents, email). Even though, compared with the user profile, the user context provides better understandings of the users, it is still under-used in most personalisation systems.

Such data that can be stored with the user profile include *user interaction history* (e.g., the past online behaviours can be tracked by Google bugs), *search history* (e.g.,

past queries and selected results), *user preferences* (e.g., what users like), *demographic information* (e.g., age and gender), and *rich user models* (e.g., user feedback on online items). The system uses bugs and cookies to collect users' online behaviour and asks users to fill in questionnaires related to their preferences and demographic information. In case the system cannot explicitly get the user preferences and demographics from the user, the missing data can be tracked and deduced from the online usage of the user. However, this method does not guarantee a correct profile.

To sum up, personalisation happens today in a complex ecosystem where more and more specific data on individuals is collected and more relevant data is offered through increasingly complex algorithms and filtering methods.

3. Implications of Personalisation

Data about our online behaviour, our interests, and ourselves is collected in order to provide us information that we find relevant. At first, this sounds fair and unproblematic, but as, for example, Pariser (2011) and Willson (2013) have brought forward, complicated ethical and social issues are related to information filtering, both on the level of the outcomes of the filtering and the politics of the filtering itself. Thus, in this section, we critically observe some of the possible implications of information content personalisation if it continues evolving as it seems to be evolving today. First, we briefly review ethics and its meaning in the context of personalisation, and, second, we concentrate on the social implications of information filtering.

3.1. Ethical Pitfalls

Ethics is the philosophy of the moral; it examines what is right and wrong conduct. One way of defining ethical issues is to say they are questions to which no unambiguous, clear and socially acceptable answers can be easily found (Clarkeburn and Mustajoki, 2007, 23). Ethics is part of all social action and naturally also the online environment where social life increasingly takes place. Laws and regulations usually support morality in societies, and, therefore, we first discuss the special characteristics of the Internet in relation to regulation, before moving on to the ethical challenges of personalisation.

How to Regulate the Internet. The Internet as a decentralised system, Web of the webs, is particularly susceptible to ethical questions, as there is no established culture or norms; instead, everything is in a constant state of flux. No one manages the code of conduct or what is accepted. Yet, many players with differing interests and power differentials are engaged, and big financial interests also are involved. The traditional rulers ~~-n~~ations and federations ~~-h~~ave a marginal role in the digital environment. National laws do not apply in the Internet as a whole, and in any case, the real world's regulations are not sufficient to answer the challenges of the digital world. As Erik

Schmidt and Jared Cohen (2013) write, the Internet is the world's largest ungoverned space. Online, the biggest and most powerful players today are commercial, such as Google and Facebook, and they currently get to set the norms of online practices with their own policies. For example, *behavioural tracking*, i.e., tracking of our online activity, is already a big phenomenon and a fast-growing business, but with very little regulation, very few rules, and not much consumer protection.

Freedom and non-regulation have been the main characteristics of the Internet for a long time, but the first attempts to define guidelines for the digital environment took place already in the 1970's in the form of Fair Information Practices in the U.S. As the Internet has become such an important and powerful arena, it seems to have come to a crossroads, where its governance and ethics are starting to be more seriously and extensively discussed on many fora and levels. For example, in the United Nations, EU, several national legislative organs, and different global coalitions, and most recently at NETmundial—The Global Multistakeholder Meeting on the Future of Internet Governance that took place in Brazil in April 2014. Regulating the Internet is, and will be, difficult as no one has the authority to pass sanctions, and new creative ways to avoid existing regulation can always be found. An extreme example is Google's plan to create enormous floating working environments that can operate in the ocean, out of the reach of mundane laws and where technologists can safely try out new things[2]. In the discussion section, we present one suggestion how the ethical management of the Internet could be implemented.

Transparency and Awareness. The central ethical issues around the current personalisation and information filtering practices relate to transparency and awareness. Information filtering is a commonplace practice among the big commercial service platforms, but the exact purposes of the filtering the operations or the processes that lead to the information filtering are not open to the users. Nor do the users know what information they are being excluded access to and what is invisible to them (Willson, 2013, 10). As Bodle (2011, 321) notes: "Present conditions for sharing through social applications include a lack of control over one's own information, a lack of transparency as to what information is being collected, and how this information is being used undermining privacy, data security, contextual integrity, user autonomy and freedom."

An open discussion is missing about what data is collected, how it is used and what is appropriate, and the role of algorithms and technology are generally poorly understood; how the technological design affects people's lives and has political consequences, enabling and also limiting various actions and practices (Willson, 2013, 9). As Lessig (2006, 5) writes, in the online world code is law: code dictates what is possible and what is not. Currently the big players are operating safely behind the curtains, and the users do not have any voice in determining the code or the per-

[2] **http://www.businessinsider.com/google-ceo-larry-page-wants-a-place-for-experiments-2013-5#ixzz30IXS7tf5**

sonalisation practices. Recently, the big European publishing house Axel Springer strongly criticised the monopoly of Google and pressed for more transparency (Döpfner, 2014).

More and more functions are based on skilful use of data. Data equals knowledge and power, and, in consequence, asymmetry in data and knowledge equals asymmetry in power. The users' role currently is subordinate. Many services require that users agree with their terms of service, which are long, complicated, and most likely not read by the majority of users. Moreover, the service platform may change the terms and conditions afterwards, e.g., Google states: "We may update the Terms in the future, and you will be able to find the most current version of this agreement at http://www.google.com/a/help/intl/en/users/terms.html." In practice, users do not even have a proper choice of opting out unless they are willing to shut themselves out of widely used services and, in consequence, out of many social contexts. As Döpfler (2014) writes: "the statement 'if you don't like Google, you can remove yourself from their listings and go elsewhere' is about as realistic as recommending to an opponent of nuclear power that he just stop using electricity." In brief, the current situation is such that to the users, the benefits of many online services are visible, but not the hindrances.

3.2. New Age Tribalism

Implications of information personalisation include tribalism. Tribalism can be defined as "a way of thinking or behaving in which people are more loyal to their tribe than to their friends, their country, or any other social group" (McMillan Dictionary, 2002). We are not claiming tribalism happens because of personalisation only, but it is an accelerating force with pros and cons.

Information personalisation enables efficient tribalism when a group of individuals interested in a certain theme find each other and start building thematic global and local communities. These sorts of tribes have existed for thousands of years but, before the Internet, not to mention social media, they tended to be more or less local. In the modern age, according to Tuominen (2011), tribalism has been manifested by, for example, consumer tribes sharing consumption values and preferences related to brands, bands and ideologies. Kozinets (Cova, Kozinets, and Shankar, 2007) points out two antecedents of tribal membership in an online context: the centrality of tribal consumption to a self-concept and the intensity of social relationships with other members of the tribe. The consumer tribes differ from the historical ones also in terms of social order their grouping is based on something emotional rather than rational, and the status within a tribe is achieved by different and specific values (Cova et al., 2007).

Today, social media has made it easier than ever to find like-minded people, share the passion and even make a living out of a niche theme, as the whole globe is a playground for anything one can imagine (Albers, 2010). Reich (2014) argues that the increasingly interconnected and globalised world diminishes the role of states,

growing the impact and role of tribes. At the same time, it becomes easier and easier to start living in a bubble with those like-minded people and base the whole world-view on thoughts shared in the small community. One of the founders of the World Wide Web even sees the social networking sites and other closed platforms as a major threat for the future of the Internet, fragmenting its structures from an open platform towards multiple closed systems storing closed silos of content (Berners-Lee, 2010).

The impact of tribalism can be both positive and negative. A simple positive example of a social-network-enabled global tribalism phenomenon is Restaurant Day, which collects cooking and food enthusiasts together in the physical world to set up amateur restaurants for one day. On the other hand, a negative tribalism phenomenon from an individual point of view can be seen, e.g., in the fragmented structure of the United States with conservative Republicans and liberal Democrats or the collision of values between European Ukrainians and Russian Ukrainians tearing the nation apart (Reich, 2014).

An extreme view of tribalism is that people start connecting more and more intensively into tribes, whereas nations, countries or other traditional organisational units as we know them today start losing their importance in the course of time (Reich, 2014). In the long run, individuals could base their identity on multiple tribes they belong to, unattached to where they come from or where they live.

3.3. Echo Chamber, Popularity Bias, and the Filter Bubble

Another implication of information personalisation is the echo chamber. An echo chamber is a closed environment with a positive feedback loop. In the context of media, it means that information, ideas, or beliefs are echoed back from other sources, thus reinforcing the information, ideas, or beliefs. Eli Pariser calls the echo chamber created by filtering "the filter bubble" (Pariser, 2011). In social networking sites, it is easy to see how this is happening already today. Interacting with posts on Facebook increases the likelihood of seeing more posts from the same author at the expense of other authors' posts. After a while, the user is left with a newsfeed filled with like-minded friends' posts. In the future, when the filtering algorithms evolve towards content-based filtering, the little diversity that remains could be in jeopardy, as the user is left with only like-minded friends' like-minded posts.

Popularity bias is another effect that personalisation algorithms amplify. It is initially the result of authors attempting to create popular content. Then, because the algorithms weigh the information relevance based on how many people have viewed, clicked, liked, or shared it, the algorithm favours the popular among the content that is already created to be popular. If the current trend of personalisation continues, popularity bias combined with the filter bubble will create to an even greater extent a fertile breeding ground for narrow-minded ideologies.

3.4. Gatekeeping

Gatekeeping theory has returned to the spotlight in research as the Internet has made it easier for almost anyone to publish nearly anything without the gatekeeping of traditional mass media; a shift of power from the gatekeepers to the audience has occurred. Gatekeeping is defined as "... the process by which the vast array of potential news messages are winnowed, shaped and prodded into those few that are actually transmitted by the news media" (Shoemaker, Eichholz, Kim and Wrigley, 2001, 233). Gatekeeping has been called the vanilla ice cream (Roberts, 2005) of mass communication theory, which has "appeal and plausibility" and applications wider than news decisions (McQuail, 1994, 277). But, it has been argued (Roberts, 2005), that gatekeeping offers little if any predictive power. As Roberts (2005) highlights: "Its chief value comes in summarizing the various forces that come into play as news people make decisions about what messages will be selected to present to their audiences." In this sense, it is important to highlight that these messages may also include ingredients such as a mix of truths, half-truths, and untruths (Stanoevska-Slabeva, 2012).

The gatekeeper offers the most relevant essence, makes vital choices, opens the right screen doors, and excludes irrelevant elements. For example, manipulators (discussed in 2.1) can be considered as gatekeepers. The regulators can *legally* require the changes in personalisation algorithms to meet their political needs (e.g., remove a news item from citizens' search results). Other manipulators, such as third-party manipulators, can *illegally* take advantage of yet-to-be-discovered vulnerabilities of personalisation algorithms to promote the popularity of their agenda, resulting in a biased belief propagated to wider audiences.

Algorithms have been introduced as novel gatekeepers. More specifically, algorithms decide which blogs get more of your attention, what movies you are more likely to watch, which websites you are going to prefer and what news of friends you are more likely to hear about (Klinger, 2013). However, it should be kept in mind that in addition to algorithms, several other factors play a role in deciding whether the offered content will receive real attention or not. While algorithms do choose the content offered at a given moment to a certain end-user, they do not choose the final behaviour of the end-user. For example, even though from a computer screen perspective it might seem that the end-user is watching a YouTube movie, the end-user may concentrate on something else, and the movie may be just another audio-visual element in the background. In other words, it is the end-users who decide whether they really pay attention, watch the movie, or read the blog. In this sense, well-educated people may be more critical towards the content they are offered and be even more selective in consuming it. However, in non-democratic societies such as North Korea and Russia the impact of institutional algorithms may be far greater than in Europe or Scandinavia, where the open nature of the Internet gives crowds and individuals more power.

3.5. Serendipity at Risk

Serendipity means a pleasant surprise, an unexpected coincidence or a random event that changes the course of actions. As Krotoski, Jungnickel, and Hammersley (2012) state: "Serendipity is a very relative thing, based on where you are in the world, what time it is, how you feel that day, what resources you have access to, what political regime you live in, and which culture you're from. Some of these can vary day-by-day, and even hour-by hour."

As the amount of personalised content as it is known today increases, the amount of serendipity easily declines: more and more information is filtered based on algorithms that produce search results and information flows founded on what the end-users or their friends have liked or wanted before. If a person is given only what he or she desires, novel knowledge or surprising connections become more rare. A big question is how more serendipity could be coded in the algorithms, as it is difficult for an individual to actively search for coincidences. Randomisation can be easily coded in the algorithms, but, as serendipity is relative, personal, pleasant randomisation, its facilitation is trickier.

Through their initiative called the Serendipity Engine (theserendipityengine.com), Krotoski, Jungnickel, and Hammersley aimed to find out what serendipity means and how it could be measured. They concluded that in order to measure it, both automated and human-powered techniques are required to generate a personalised Serendipity Recipe. The aim of the machine is to create relative randomness by trying to define things an individual pays attention to and put a new spin into them. They identified seven scales based on which serendipitiousness of a person could quite well be measured: *social support* reflecting how tightly you are connected to your nearest and dearest, *creativity* reflecting your ability to see non-apparent connections between things, *physical well-being* reflecting how good a condition you are in, *headRAM* reflecting your capacity to keep things in mind at one time, *attention* reflecting the amount of attention one can pay to surroundings while distracted, *access to knowledge* reflecting the amount of information you can reach easily, and *grit* measuring your tenacity related to serendipity.

4. From Liking Towards Needing

Even though the outlined implications of personalisation might seem naive, scary, or farfetched depending on an individual's attitude, we assume that the technological development strives to provide us with ever more personalised information content in the future. In order to personalise in a more effective manner and provide more relevant results and services for the end-users, an increasing amount of personal behaviour data must be collected. Therefore, this section discusses the potential trends incorporated in the personalisation paradigms of the future through existing and evolving

technologies such as emotion tracking, physiological sensing, and geo-location.

Although we live in a consumption economy, a person is not solely defined by what he/she consumes and likes. Churchill (2013) highlights that personalisation is about individualisation and specialisation. He argues that we need to put the person back into personalisation through, for example, outcome and process personalisation paradigms. In his view, in addition to consumption habits, people are defined also, for example, by the ways they act, the ways they feel, the places they go, the actions they take, the ideas they have and the way their bodies function. The actions of an individual tend to evolve over the course of time, which creates another challenge for personalising information content.

4.1. Weak Signals

Potential information for the construction of the user profile that have not been utilised to a full extent include: *geo-location* where content can be personalised based on a person's location detected by his mobile phone or his social media activities, such as Foursquare; *physiological* sensing what a person's physiological and mental factors are, with the help of wearable chips, phone apps or e-diaries, such as Suunto applications, Mood Panda, Stress Check and Sleep Cycle; *fuzzy-logic* where the personalisation algorithm shuffles the results in a pleasantly random way, such as theserendipityengine.com; and *meta-algorithms* where the end-user can decide the sorts of filters he/she wants to see the results through, such as News360 news service.

Examination of Facebook's and Google's recent acquisitions can provide some weak signals on potential future personalisation practices, assuming that they want to maintain and develop the acquired services and collect user information for more relevant personalisation. Since April 2012, Facebook has acquired twenty-one companies[3]. The focus on mobile devices can be seen as a relatively valid factor as five acquisitions are directly related to mobile devices. Regarding the mobile sensing and information collection of human behaviour, four of the acquisitions enable Facebook to analyze or collect human conversations, one focuses on social discovery, one on facial recognition, five on content sharing, five on advertising or marketing, one on virtual reality, one on verification, and one on design. Since April 2012, Google has acquired thirty-six companies[4] with focuses on robotics (seven acquisitions), advertising (five), commerce or marketing, mobile gadgets (eight), mobility or mobile applications (three), Internet security (three), analysing human behaviour such as gestures, expressions, language and social predictability (five), and the five remaining on hardware, cloud computing, photography, and artificial intelligence.

Assuming these acquisitions might outline some weak signals, one can predict the two largest personalised online service platforms still concentrate on advertising as

[3] **http://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Facebook**
[4] **http://en.wikipedia.org/wiki/List_of_mergers_and_acquisitions_by_Google**

their funding mechanisms, with an emphasis on mobile and wearable devices. Their data collection seems to expand towards a wide range of data on both physiological and linguistic interaction in human behaviour. Facebook still concentrates on facilitating sharing and communication between individuals and groups, and we will see how the company leverages our conversations in constructing our user profiles. Google seems to focus on analysing patterns of human behaviour and linking it with artificial intelligence and robotics. Hopefully, we will soon have our own personal robots that assist us in our daily life and labour tasks. Overall, these acquisitions undoubtedly indicate that more and more data on physical and mental human behaviour is going to be collected, analysed, and used for more personalised commercial purposes.

4.2. Emotions

"One important but often overlooked aspect of human context of ubiquitous computing environment is human's emotional status" (Tseng and Ho, 2012).

In this era of the ever-growing individual consciousness, integration of emotions into personalisation can produce more fine-grained information on the user at a given moment and thus make media content differentiation more effective (Tseng and Ho, 2012). For example, future news feed and search results may not only have functions meeting different customers' needs and wants, but also functions to meet their fluctuating emotions. In this sense, emotions may provide deeper understanding of consumers, who wish to express their self-image and taste through media consumption on a more sophisticated level.

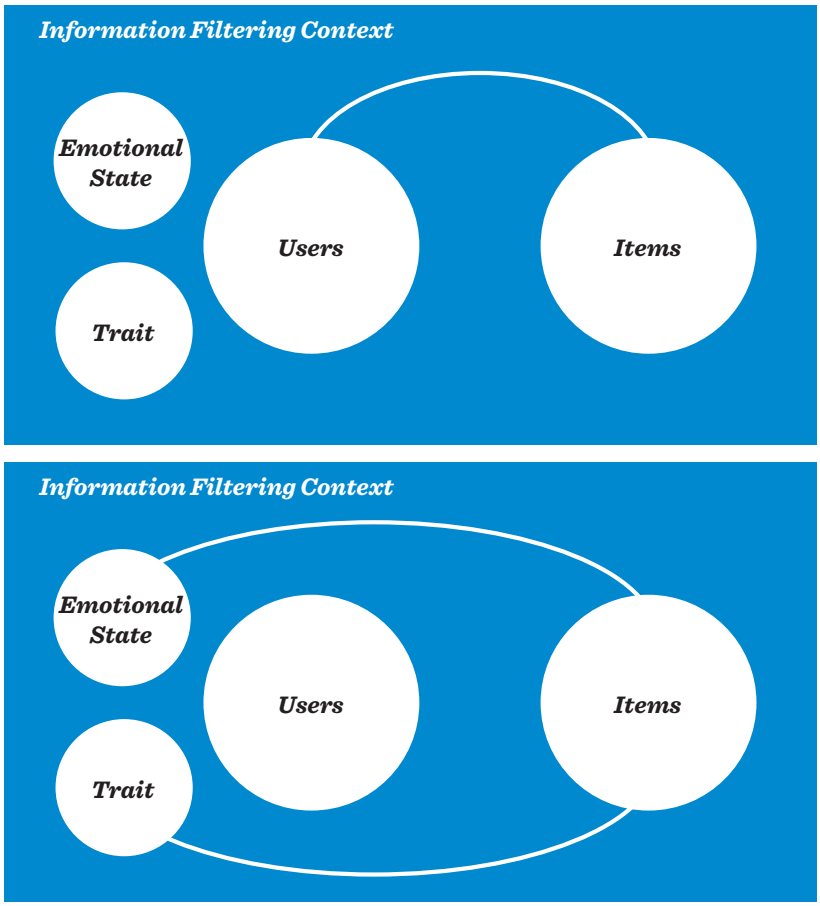

Fig. 4. ***Integration of emotional states and traits with preferences***[5]**.**

As to date, personalisation of items such as news feeds and search results has been mostly based on users' demographic data and browsing history. However, in the future the role of soft attributes will increase and personalised items will most probably be based on more fine-grained data such as users' traits and emotional states (Fig. 4). In this sense, with more sophisticated applications that detect and reflect our emotional state online, the online service platforms will have a wealth of data to play with.

Drawing from Basak (2013) and the context of retail, the digital space is used for three things: to inform the user, to personalise news feeds and search results, and last but not least, to draw an emotional connection to the essence of the information (Fig. 5). In this respect, excellence in design of personalised information is about creating a positive, rich, and meaningful user experience through appealing to the cus-

[5] **http://emotionsense.org/**

tomers emotionally. Therefore, we suggest that in order to stand out, the personalised information needs to evoke emotions and go beyond the end-user's rational surface.

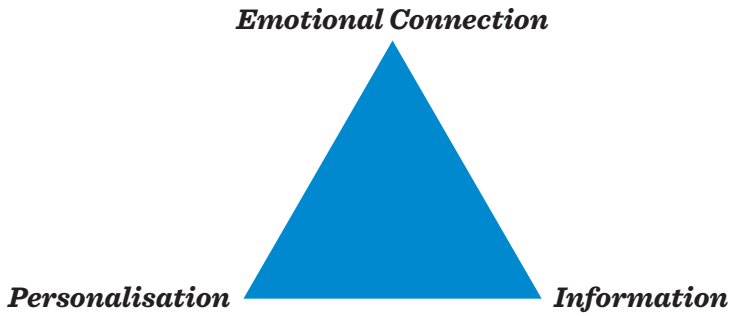

Fig. 5. ***Emotional connection in between personalisation and information (Basak, 2013).***

The most widely accepted approach in emotion research is the *valence-arousal dimensions model* (Heller and Nitscke, 2010). Valence is the discrimination between positive and negative experiences, and arousal is the intensity with which the emotion is experienced. There is a multitude of opportunities for open minds in aligning emotions with personalisation. For example, Berthelon and Sander (2013) present a prototype architecture for a system for determining emotion from multi-sensory input. The authors introduce Personalised Emotion Maps to map sensor input into emotion values and explore different types of stimuli expected to provoke similar emotions, for example, satisfaction or joy at either succeeding at a computer game or while watching a favourite movie.

In affective computing, the emotions of human interactions with computational agents are taken as the starting point of the design processes (Lee and Kwon, 2010; Picard, 1997). Autonomic response signals from non-invasive bio-sensors may be used in conjunction with a wearable computer for real-time portable signal acquisition (Lee and Kwon, 2010; Starner and Mann, 1997). In this sense, measurements such as blood volume (BVP), heart rate (EKG), galvanic skin conductance (SC), and respiratory rate are commonly used. Characteristic patterns of these signals correlate with different self-reported emotional states (Lee and Kwon, 2010; Starner and Mann, 1997). It will be interesting to see the upcoming innovations that originate from introducing people's emotional status to personalised information filtering in the context of online service platforms.

Emotion-driven Personalisation Goes Mobile. The mobile era drives the increase of opportunities in human-centric service technologies that focus on emotional cues. In this sense, each user can be targeted with more appropriate contents while on the go based on their emotional status. Lee and Kwon (2010) propose methodological algorithms that enable constructing an emotion tagged content repository using

a tagging technique and searching personalised content based on the user's current emotional status.

For example, the Emotionsense application aims at predicting consumers' emotions through exploring how mood relates to our phone's sensor data. This app collects data by asking the users to complete short surveys about their emotions at different time nodes. By clicking on "how do you feel", a longer survey about variables such as mood, location, and activities will follow. Social activity is measured with the number of phone calls and text messages, and physical activity is measured with an accelerometer. The app does not save text messages, and the data about mood and sensors are accessible only to members of the research team, and only for the purposes of conducting research about how mood relates to your phone's sensor data.

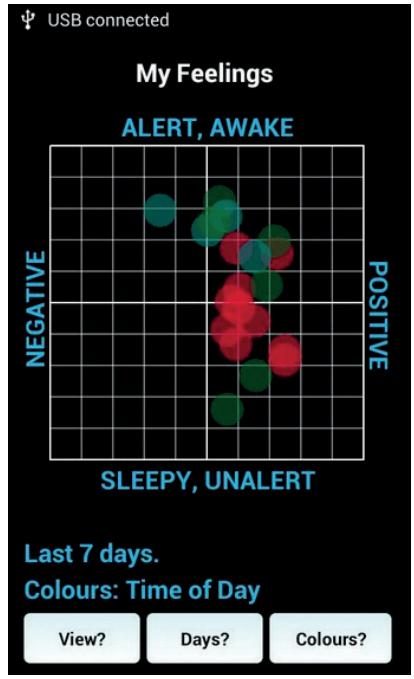

Fig. 6. ***Emotionsense application***[6]

Another emotion tracing application is Mood Panda, a virtual diary that keeps track of emotion fluctuations. Mood Panda is also a social network, where users can receive virtual support, for example, virtual hugs from their peers when feeling blue.

Moreover, many start-ups are now building novel software based on empathetic algorithms. For example, a UK start-up, EI Technologies, has developed algorithms that are able to analyse the tonal expression of the human voice, rather than verbal content – with the initial aim of powering a smart phone app that can help people

6 **http://emotionsense.org/**

track and monitor their moods (Lomas, 2013). This empathetic algorithm identifies five basic emotions: happy, sad, neutral, fear and anger. As Lomas (2013) points out: "The system works by looking for 'key acoustic features' and then cross-referencing them with a classification system to match the speech to one of the five core emotions." Another start-up, Beyond Verbal, from Israel utilises empathetic algorithms to identify how someone wants to be perceived, rather than focusing on his or her immediate "emotional layer" (Lomas, 2013).

However, as to predicting emotions, we suggest that same variables may not result in the same emotions every moment and that random coincidences may play a great role. In this respect, it is reasonable to treat relative serendipity based on location, time, resources, political views, and culture as an element to be taken into account in further explorations. Moreover, drawing from Lee and Kwon (2010), we suggest that results are influenced by the way a person observes the world around him as well as by his emotional state at the time when those situations take place.

The Role of Emotions in Future Algorithms. In light of the above, we predict that in order to shift from history-looking like-based algorithms towards algorithms that track the current state or even predict the future, elements such as physiological sensoring, geolocation, emotions (see 4.2 Emotions) and serendipity (see 3.5 Serendipity at Risk) can have a larger role in algorithms in the future. Integrating these factors in, for example, Facebook's EdgeRank could have a tremendous effect on the search results in dimensions of time, mood and feel at the very moment the end-user consumes the information flow. More specifically, given that "U" is the affinity between viewing users and creators, "W" the information weight and "D" the time when information was created, what if an emotional factor "E" would indicate what the user feels and expresses while consuming the service? Adding on the factor of serendipity "S", future algorithms could offer the end-user something s/he did not even know s/he was looking for.

Then again, if more and more personal data is collected and not only even based on what people say they are doing or have done before, but what they really are doing or feeling at the very moment, the possibilities for the misuse of the sensitive information and also both negative and positive implications increase.

5. *How Can Ethical Personalisation Be Ensured in the Future?*

This paper outlines some of the implications and possible future directions of personalised information filtering. They are brought alive in the utopian and dystopian scenarios at the end of the book. In order to support the realisation of the utopian prediction, we formulated an ethical code for purposeful personalisation. The idea of regulation that would have power over the whole Internet seems unrealistic; for example, how could such a law be accepted globally or who would enforce it. Laws

also have the tendency to be too general for specific purposes and not flexible enough to adapt to the changing circumstances. Therefore, ethical codes are commonly formulated within different professions or organisations. Before presenting our code of ethics, we briefly discuss the premises of the ethical information filtering.

5.1. Users Have to Take the Power

The Internet is by nature an uncontrollable environment that highlights openness. It is still lacking a proper social contract: a model to define the relations of different actors and regulation. The social contracts of the real world are shown to be inoperative in the online environment; there have been many attempts to set rules for the Internet, but so far, no global solution has been found. We believe that regulation of the Internet will not be possible to execute from above; it has to originate with the users. The inventor of the World Wide Web, Tim Berners-Lee (2014), has recently expressed his concerns over the commercial and governmental forces taking over online. He has made a claim for a Magna Carta for the Internet and has launched a campaign called Web We Want[7] to defend and claim a Web that is open for everyone. There is wisdom in Berner-Lee's words: *Magna Carta* is the first form of constitutional law, issued in 1215 in England. It is remarkable as it set the law and, in consequence, the people, above the king. A king cannot rule unless he has subjects, and to have his subjects, he had to accept the law. This idea can be applied to the ethics of the Internet as well: the users should be the initiators in setting the rules that online service platforms would be required to comply with ~~ot~~herwise they will not have users. Fair and trustworthy services could be made recognizable with an ethical certificate, and the users could rank the trustworthy services. Only services with *trust capital* will survive.

Currently information filtering is lacking transparency: the big players are operating behind the curtains, e.g., they collect data about us and use it for their own purposes with a hidden agenda. A central enabler for these actions is that so far there has not been any general interest in, or awareness of, information filtering and the power of algorithms. As we wrote earlier, code is law in the digital environment (Lessig, 2006, 5); it determines what is possible and what is not. Empowerment of the users requires understanding the code and the power of the data: what is collected, how it is used, for what purposes and how it can affect our lives and alter the way the world is presented to us. Generating such awareness requires the diffusion of a new skill: code literacy. Already now, such a big part of our activities take place online and are managed by algorithms that the basics of coding and understanding of its role and possibilities should be part of everyone's general education. Policy makers, educators, media, and the online service platforms are key players in building this new literacy.

7 **https://webwewant.org**

We claim that, once code literacy and better awareness of information filtering and its effects have become commonplace, there will be more variety and competition, as people will have the competence to demand fair, transparent services, and the law of supply and demand will ensure the availability of such services. Digitally literate users will choose to use only services where the preferences are intuitively understandable and adjustable, unlike in the current services, which can change their one-kilometre-long terms and conditions overnight. Users can also feed complexity of their online identities and increase serendipity in the information that they are being offered with their own online behaviour by being unpredictable and cherishing diversity.

In such a digitally enlightened world, one's digital profiles could be managed through an online service, which is presented also in our utopian narrative at the end of this book. Some trustworthy party (cf. Finnish online bank services) could provide a profile management service where users can manage their digital identities. One can have several profiles: for example, one professional for work-related information searches and work-related news, and one leisure profile for free time, lacking work-related content. In addition, one could have also a clandestine profile, for example, for socially less-acceptable online activities. The service could even provide imaginary profiles so that the user, for example, could view the world through the eyes of a fourteen–year-old Afghan boy. The user could always choose which profile to operate with and the profiles could be easily edited: hobbies could be removed once they are not of interest anymore and political views revised as one's opinions change.

However, this kind of alternative is functional only as long as the users share a certain level of competence and are willing to devote time on managing one's own data and identities. It is clear that not everyone in this world has or will have the competence or interest. Therefore, we claim that the ethical personalisation has to be built into all services that filter information. The settings should be ethical by default, without any action or proactivity required from the user. The opt-in principle should be used: no information filtering is done unless the user specifically agrees to that. User interface should be intuitively understandable and simple. When content is personalised, it should be explicitly clear, that just one view on the world is being offered, like in News360.com, and most preferably the diversity of the options available and left out should be communicated to the user, e.g., with a visual user interface like SciNet[8], designed by HIIT. Service platforms should aim at producing serendipity and variety in the content ~~an~~d not just filtering content that is known to match the user's interest profile, based on the browsing history. The algorithms should be built so that they constantly test the user by offering results outside the known core of interests; users must be seen as dynamic creatures with changing opinions, interests and needs, and not as a static profiles.

8 **https://www.hiit.fi/node/2659**

5.2. Actors to Whom the Ethical Code Is Targeted

We need to acknowledge the power of the algorithms that shape our worldview and understand the impact of the largest players, their motivations, and their ability to dictate their own rules. The players are commercial companies, whose goal is to make money and there is nothing bad about it, but they should not be able to operate behind closed curtains we should know what our data is used for and what the agenda is behind the information we get.

Moreover, if we try to achieve a mutual understanding on the rules and the principles, we assume the services will be more secure and better in the long run. Four stakeholder groups on different hierarchical levels should understand the rules, principles, and responsibilities. First, the users who are assumed to have the least knowledge on the implications; second, the educators who should function as interpreters between the end-users and the online service platforms; third, the regulators who should protect the users while enabling companies to thrive; and fourth, the online service platforms who have the strongest and most direct influence over the code and, in consequence, the biggest responsibility on the implications.

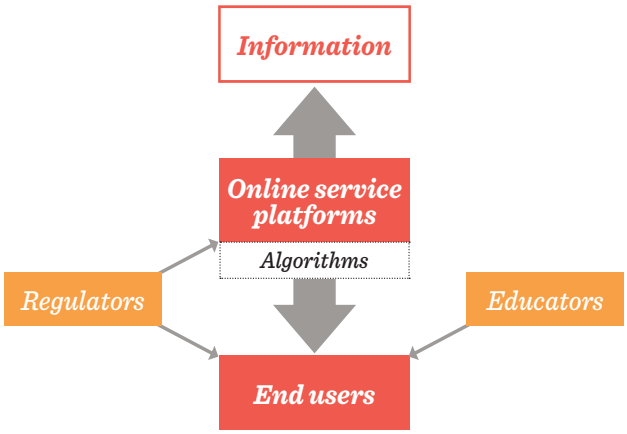

Fig. 7. ***The actors at whom the ethical code is targeted***

The following ethical code is built on and aims at extending the advice of Pariser (2011) and Krotoski (2011). It is targeted at the four mentioned stakeholder groups.

5.3. Ethical Personalisation Code

We think pursuing the following advice targeted to the end-users, online service platforms, regulators and educators will help in reaching a fairer, clearer, more trustworthy and more transparent information personalisation environment than the one we are living in today.

Table 1. ***Ethical Personalisation Code.***

Stakeholder group	**Do's**	**Don'ts**
End-users	+ Be literate: Understanding the basics of coding and algorithms is and will be indispensable. + Be critical: acknowledge the agendas of the services you are using and the bias of the information sources. + Be active in drawing your view of the world. You have more responsibility, as all information can be filtered and personalised. + Claim fairness: Use only services that have an ethical certificate/are widely recognised as ethical; services which have terms and conditions that are understood easily and quickly and are not changed repeatedly; services which are explicit in their agenda and which allow you to easily manage the filters and preferences. + Remember the power you have: Online service platforms cannot do without their users. + Cherish serendipity and diversity: Show active interest in multiple topics and viewpoints. Even exaggerate! Be unpredictable in your online behaviour so that your profiles become more multidimensional and dynamic. + Be active: review and update your settings monthly; take advantage of the information filtering. + Remember your responsibility: show respect to your peers in your online activities/ behaviour.	– Don't be naive: Don't assume there are free lunches. If the service if free for you, you are the product and your data is the developer's currency. Don't think there is no agenda in the filtering. – Don't be unrealistic: understand that algorithms are not humans, but mathematical approximations the results of which are based on data about you and your actions. Their abstractions seem perfect on paper, but, once applied in the real world, they are hardly ever correct. – Don't misuse algorithms yourself, either: don't utilise them for inappropriate, illegal or criminal purposes.
Educators	+ Study the services and their terms and conditions. + Teach the principles of the services and their terms and conditions. + Provide alternatives for mass services if you consider them unethical. + Demonstrate the best- and worst-case scenarios. + Raise awareness and teach the possibilities for modifying and controlling your data and information filters. + Differentiate the rules of the physical and the virtual world. + Take into account that kids use the Internet from a very early age. + Highlight carrots, not sticks: punishments may yield negative influences.	– Don't assume everyone is as educated. – Don't assume youngsters know the drawbacks. – Don't underestimate the power of spending time with the gadgets online. – Don't underestimate the pace of development. – Don't underestimate the creativity of the illegal actors and online criminals. – Don't preach but rather give inspiring examples of how the Internet can play a big role in making the world a better place.

Regulators	+ Always refresh your knowledge. + Collaborate internationally. + Set common global rules for common global digital operations. + Emphasise the role of awareness in utilizing services. + Be certain of the security issues when it comes to privacy. + Raise awareness of the possible drawbacks of the systems. + Allow educators to teach the rules of the places where most students spend a large part of their time. + Force companies to be transparent in their agendas and processes. + Build a valid alternative through collaboration and supporting multiple smaller players. + Think about the best- and worst-case scenarios. + Be open and adjustable to future changes. + Encourage start-ups to create novel ethical online services through funding (Tekes, EU funding etc.) and other reward mechanisms. + Create a tax deduction protocol for ethical players. + Encourage and support civil activity in both putting pressure on online service platforms to make them operate in a more ethical way; give support and credit to those who foster ethics.	– Don't allow one player to become too dominant, but encourage collaboration among multiple stakeholders. – Don't neglect the sensitivity of information, for example, emotions are not to be used for commercial purposes without the end-users knowing it. – Don't spend time and resources on copyright protection that does not work. – Don't concentrate too much on illegal business models (e.g., Cryptolocker); rather, shed light on creative examples from the more ethical business context. – Don't underestimate the effects of illegal operators and their futuristic visions.

Online service platforms	+ Visualise: a clear visualisation of what information an individual is sharing, what the information filtered is based on, and the ability to switch off and adjust sharing and filters whenever wanted. + Meta-personalise: provide the ability for the end-users to decide on his or her personalisation ID at a peculiar time. + Serendipitise: integrate serendipity into the code and provide surprising, yet interesting hits for the end-user. + Emotionalise: integrate emotions in the code to serve the end-user more precisely. + Prioritise ethics: the service has to be ethical, fair and unproblematic by default. + Give power to the user: open your algorithm, allow the active and competent users to edit the preferences and algorithm, e.g., to choose which variables they want to be used in the filtering. + Need vs. want: try to provide the end-user information important for their personal growth (e.g., not what they assumedly want but also what they need). + Balance and differentiate among entertainment, advertising and factual information. + Consider the power of the impact of your code. + Educate the users and raise awareness of the drawbacks. + Be transparent and honest. + Consider the person a person. + Provide opportunities to be involved without providing personal information. + Understand the dynamic nature of human beings they are not static in their actions, opinions or emotions. + Be clear and explicit don't use vague expressions (like "third parties"). + Use your power and coding skills to make the world a better place.	– Don't dream about being able to know the users: They are not a line of zeros and ones but dynamic creatures, human beings that act organically: they change their mind, values, opinions, and areas of interest. – Don't imagine that you know them entirely. There are always things that have not come up yet. Build the algorithms so that they constantly test the user by offering results outside the known core of interests. – Don't provide a junkie with a new pill, but offer him or her help instead. – Don't assume everyone is as educated as you. – Don't assume everybody knows how to modify their profiles and control their filters, but teach them instead. – Don't underestimate the power of your algorithms. – Don't use emotion for commercial purposes without the end-users knowing it. – Don't provide the user's private data to third parties without the user's consent. – Don't use your skills for criminal or shady purposes.

To sum up the table, users are at the core of commercial online operations; they are the product that is sold to the advertisers by the online service platforms; they provide the data that the operations are based on. Controversially, they are the ones who should be considered to have the least education or knowledge on how the personalisation algorithms function. What we are calling for from the user side is awareness. To enable the awareness, we require related knowledge and education from both the educators and policy makers they won't be able to regulate nor educate if they don't understand the fundamentals of the systems. To enable the regulators to educate and understand, we require openness, from the side of the online service platforms.

6. Conclusions

Today, algorithms replace the human factor in gatekeeping. As more and more information is personalised based on increasingly precise data collected on the users, the level of awareness of the possible implications must be raised. Personalisation practices should be brought to open discussion. Users have to become aware of information filtering and its effects so that they can demand fair practices from the online service platforms – and choose not to use the unfair services. If fair and ethical services are asked for, the laws of supply and demand should ensure their availability. Not all users can be expected to have competence or interest to stand up for themselves. Therefore, ethicality has to be ensured by the whole ecosystem; the biggest responsibility lies naturally with the providers of the service platforms, but the pressure from the users is the most potential means to force the service platforms to act ethically. Educators can enable the empowerment of the end-users, and regulators can support the development of a fair digital environment by setting rules with which the end-users and the online service providers have to comply.

We claim that by following ethical principles, both the service platforms and their users gain benefits. From the developer side we call for transparent actions and a balance between relevance and serendipity. From the end-users, this requires proactivity and awareness. Educators and policy makers should take a larger role in proactively interpreting the implications of personalisation towards the users and actions of users towards the companies. The essence of building the principles lies in finding the balance between the users' interests and those of the companies.

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