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## Personalised video recommendation system and its potential role as a trigger of addiction

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**Abstract.** The influence of search engine algorithms on society's collective thinking is substantial. Initially, engineers aimed to develop algorithms that would provide optimal results for relevant keywords. However, the focus later shifted towards implementing personalised search methods that could deliver the best results tailored to individual users. Personalised search is a feature designed to enhance user engagement by analysing and profiling their previous search interests, with or without explicit user consent. Through advanced technology and refined machine learning techniques, popular websites and applications store and analyse user preferences. For content developers, particularly those offering video content, the primary goal of personalised search algorithms is to increase users' time spent on pages. However, the psychological consequences of this approach remain ambiguous, as it could heighten vulnerability to dependency signals and trigger a fascination with appealing behavioural patterns. This is especially problematic for individuals who are already dependent on specific habits, such as internet addiction, gaming, pornography addiction, or obesity and are striving to limit their susceptibility to dependency signals. For instance, if a person with obesity is advised to watch videos featuring food-related cues, it might hinder their ability to restrict food consumption. Prior investigations are analysed in this study to explore the potential repercussions of personalised search recommendation systems on dependency. Considering the proposed mechanisms of dependency, addressing these aspects becomes essential to mitigate the risk of undesired influence from captivating dependency signals. Thus, the purpose of this study is to identify the relationship between personalised search and the emergence of dependency, shedding light on this crucial issue

**Keywords:** personalised search; video recommendation system; addiction; addiction cues

## INTRODUCTION

The introduction of personalised search represents an innovative approach that has the potential to profoundly alter the habits and lives of numerous internet users. This is particularly evident in the case of personalised video recommendation systems that utilise machine learning (ML) and directly influence behaviour through visual cues. However, a lack of understanding regarding the underlying goals of personalised search

can leave internet users with a limited understanding of the nature of these changes, thereby affecting the effectiveness of the personalised search method.

The presence of addiction further exacerbates the issue, imposing a considerable burden on governments in terms of treatment expenses, such as addiction clinics and specialised addiction treatments. Additionally, excessive engagement in addiction-related activities

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can lead to reduced productivity, further compounding the socioeconomic impact. In the specific context of personalised search and addiction, notable examples include internet addiction and porn addiction. Summarising, the study seeks to investigate the potential outcomes of personalised search recommendation systems on addiction by analysing previous papers.

## MATERIALS AND METHODS

A narrative review methodology was used to review the literature. The search yielded a collection of papers that examine the literature on personalised video recommender systems.

## RESULTS AND DISCUSSION

Various studies related to personalised search and its impact on people were analysed. In summary, personalised search is an innovative method that has the potential to bring about substantial transformations in the habits and lives of internet users. However, the lack of understanding regarding its goals can hinder users' ability to comprehend the direction of these changes. Moreover, addiction, including internet addiction and porn addiction, poses substantial challenges, both in terms of treatment costs and reduced productivity, within the context of personalised search and its impact on individuals and society. Internet addiction, in particular, inflicts damage on individuals' lives, manifesting in neurological complications, psychological issues, and social problems (Cash *et al.*, 2012).

D. Jannach & M. Ludewig (2017) note that many of today's sites use recommendation technologies to create personalised item suggestions for the visitors. A recommendation system designed by personalised search can be aware of the users' desires and provide a vast amount of relevant content to keep them online. Customised search results can consider both weekdays and weekends, according to the fact that individuals may exhibit distinct behaviours during weekends compared to weekdays when they are working (Tripathi *et al.*, 2019).

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Personalised video recommendation techniques concentrate on leveraging user profiles to accurately represent and understand user preferences (Deng *et al.*, 2015) using bots (Speretta & Gauch, 2005). There is a limited body of literature exploring the connection between personalised search and addiction. Specifically, the mechanisms through which the YouTube video recommendation system may contribute to potential addiction remain unclear.

A study criticised the personalised search approach as the static assumption is insufficient to reflect users' dynamic interests, especially in the video recommendation section with substantial changes of contents of videos (Gao *et al.*, 2017). However, another study claimed that personalised search has improved over web search on some queries but has little effect on other queries and may even harm search accuracy (Dou *et al.*, 2007).

The findings of a different study demonstrated certain patterns of network interactions in response to videos and provided insights into mechanisms by which behaviour of internet users are biased by personalised recommendation systems (Su *et al.*, 2021). While personalised recommendation systems offer tailored content and improved user experience, their implications on addiction are still relatively unexplored.

## CONCLUSIONS

Ultimately, assessing critical risk factors associated with a personalised video recommendation system regarding addiction susceptibility is important. Therefore, websites and especially video applications should provide information about the potential risks of personalised search and addiction. Moreover, they should provide an option to search without personalised suggestions.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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## Система персональних відеорекомендацій та її потенційна роль у сприянні розвитку залежності

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**Анотація.** Вплив алгоритмів пошукових систем на колективне мислення суспільства є значним. Спочатку інженери ставили за мету розробити алгоритми, що забезпечували оптимальні результати для відповідних ключових слів. Однак згодом увага була переключена на впровадження персоналізованих методів пошуку, які мали надавати найкращі результати, адаптовані під індивідуальних користувачів. Персоналізований пошук – це функція, спрямована на покращення залученості користувачів, шляхом аналізу та профілювання їх попередніх пошукових інтересів, за або без явної згоди користувача. За допомогою передових технологій та вдосконаленим методам машинного навчання, популярні веб-сайти та додатки зберігають та аналізують вподобання користувачів. Для розробників контенту, особливо тих, хто пропонує відеоконтент, головною метою алгоритмів персоналізованого пошуку є збільшення часу, який користувачі проводять на сторінках. Однак психологічні наслідки такого підходу залишаються неясними, оскільки він може збільшити вразливість до сигналів залежності та викликати пристрасть до привабливих моделей поведінки. Це особливо проблематично для людей, які вже залежні від конкретних звичок, таких як інтернет-залежність, геймінг, залежність від порнографії чи ожиріння, і намагаються обмежити свою вразливість до сигналів залежності. Наприклад, якщо людині з ожирінням рекомендують дивитися відео з сигналами, пов'язаними з їжею, це може заважати їй обмежити споживання їжі. Для вивчення можливих наслідків систем персоналізованих рекомендацій пошуку на залежність, в даній роботі були проаналізовані попередні дослідження. З урахуванням запропонованих механізмів залежності важливо розглядати ці аспекти, щоб зменшити ризик небажаного впливу залучаючих сигналів. Таким чином, дана робота спрямована на аналіз зв'язку між персоналізованим пошуком та виникненням залежності, розкриваючи цю важливу проблематику

**Ключові слова:** персоналізований пошук; система відеорекомендацій; залежність; сигнали залежності