

POLICY BRIEF #97

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Beyond the filter bubble: five misconceptions about serendipity and artificial intelligence

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In 2011, Eli Pariser's book *The Filter Bubble* brought the debate about algorithmic personalisation into sharp focus. He warned that algorithms were becoming increasingly good at predicting our interests, potentially trapping us in personalised information bubbles: worlds in which we are served more of the same while other perspectives fade from view.

Fifteen years later, that concern remains relevant. Algorithms no longer just determine which news articles, films or music are shown to us. With the rise of generative AI, they increasingly help us find, summarise, interpret and even generate information. What does this mean for our opportunities to discover something unexpected?

This brings us to serendipity: discovering something interesting or valuable without having planned to do so. As part of the *Serendipity Engine* research project, we explored how digital recommender systems can support serendipity. Our findings challenge several common assumptions about serendipity and raise questions about the possibilities of generative AI.

1. Serendipity is pure chance

Alexander Fleming's discovery of penicillin is a classic example of serendipity. The mould that contaminated his Petri dish was indeed a matter of chance. But Fleming noticed the unusual result, recognised its significance and investigated it further. Other scientists built on his work. Only then did this chance event lead to the development of a life-saving medicine.

Serendipity therefore involves more than chance. It also requires *sagacity*: the ability to recognise value in an unplanned event. So, what role can technology play? [Can we plan for the unplanned?](#) We cannot plan the discovery itself, but we can shape the conditions in which it might happen. Some environments offer more opportunities to encounter something unexpected, spend time exploring it, experiment or pursue an uncertain direction. We cannot guarantee serendipity, but we can create conditions that make it more likely.

2. Serendipity is unfamiliar and unexpected

Research on digital technology often equates serendipity with relevant, novel and unexpected information or items. [Yet our research into user experiences shows that serendipity can take different forms.](#) People sometimes discover something beyond their usual interests (*taste broadening*), deepen an existing interest (*taste deepening*) or rediscover something they once valued (*taste reincarnation*).

There is therefore no single, universal understanding of serendipity. In discussions about news and democratic debate, for example, it is often associated with discovering different viewpoints and perspectives. On a streaming service, however, encouraging serendipity is more likely to

mean helping users discover new content to keep them on the platform longer. Anyone seeking to support serendipity needs to make clear which form they want to encourage, for whom and for what purpose. Only then can we design for that form of serendipity and evaluate whether our approach works.

3. Serendipity is the solution to filter bubbles

In debates about algorithmic personalisation, filter bubbles and serendipity are often presented as opposites. Either algorithms keep us within our existing interests, or serendipity helps us break free of them. But this overlooks an important distinction: serendipity and diversity are not the same thing.

Users can experience serendipity within a filter bubble, for example when an unplanned discovery deepens an existing interest. A serendipitous experience does not necessarily broaden someone's information horizons. Conversely, exposure to diverse information does not automatically mean that someone will find it valuable.

If the aim is to bring citizens into contact with a range of societal perspectives, simply asking whether users discovered something new or surprising is not enough. This tells us little about the nature of the discovery, let alone whether it contributes to the intended societal goal. Building on our research into different forms of serendipity, we therefore developed the Serendipionnaire: a modular questionnaire that allows us to measure more precisely which aspects of serendipity users experience. This helps us assess whether those experiences align with what we intended the system to achieve.



Illustration: Willem Pirquin/Annelien Smets

4. Better algorithms are the key to serendipity

When we think about using technology to encourage serendipity, changing the algorithm may seem the obvious place to start. But our research shows that other elements of a digital system can also play a role.

Consider a museum visit. An artwork you might otherwise walk past can suddenly become interesting when someone points out a particular detail or tells you the story behind it. In digital environments, too, the way information is presented can make a difference. In our research, we explored how different types of introductions accompanying music recommendations can support specific flavours of serendipity. In another study, we found that

labels such as “*Discover These Hidden Gems*” create expectations that help shape users’ willingness to save unfamiliar films for later. What matters is therefore not only which information is recommended, but also how it is presented and how users can explore it.

5. Generative AI leads to more serendipity

New information technologies have often raised questions about the future of serendipity. In *The End of Serendipity* in 1997, Ted Gup warned that the internet would limit our opportunities for chance discoveries. Similar concerns later arose around algorithmic personalisation. With generative AI, the narrative seems to be shifting. Large language models can generate endless suggestions, make unexpected connections and spark ideas we might never have thought of ourselves.

But does this abundance of possibilities also mean that we are more likely to find ourselves on an unexpected and valuable path? Generative AI can combine information in new ways, but those combinations do not necessarily lead to discoveries. Much also depends on how people use the technology and the opportunities they have to explore further. An unexpected suggestion is not yet a serendipitous discovery.

At the same time, AI’s growing efficiency raises new questions. When an AI assistant immediately provides a coherent answer, we may have less reason to search across different sources, follow unexpected paths or make connections ourselves. Yet these detours and moments of cognitive friction are not necessarily wasted effort. Sometimes, they are precisely what gives rise to new insights.

This brings us back to *sagacity*. As Fleming’s story illustrates, serendipity requires both an unexpected event and the ability to recognise its value and build on it. As increasingly autonomous AI agents become able to explore information and take further steps independently, we must ask whether technology can also take on more of this role. Which paths will AI follow, who decides which are worth exploring further, and whose interests shape those choices?

Implications for policy and practice

Our research shows that serendipity is possible in digital, personalised environments and that we can deliberately design for it. But this requires more than an algorithm that occasionally recommends something unexpected. For organisations and policymakers, the starting point is to ask which forms of serendipity they want to support, for whom and for what purpose. We then need to examine how different design choices can contribute to those goals and assess whether they deliver the intended experiences and outcomes.

Generative AI adds further questions: about the opportunities technology offers for discovery, but also about what happens when we delegate more of the searching, interpreting and further exploration to AI. Who then decides what is worth discovering?

About the authors

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About Serendipity Engine

Serendipity Engine is a strategic basic research project funded by the Research Foundation – Flanders (FWO). Led by Prof. Annelien Smets, it brings together a multidisciplinary research team from imec-SMIT (VUB), imec-IDLab (UGent), Adrem Data Lab (UAntwerpen) and imec. Further information and research findings are available at www.serendipityengine.be.



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