Serendipity Engine

Advisory Committee Report

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The Serendipity Engine project focuses on serendipity and recommender systems. While many advocate for designs for serendipity in recommenders, one could ask the question what does this mean in practice? Serendipity is generally understood as a beneficial design principle ought to deliver societal value, however, putting it into practice still presents major challenges. The Serendipity Engine project sets out to address these challenges and support societal stakeholders in designing recommender systems to foster serendipity in public contexts.

The Serendipity Engine research consortium consists of the following partners:

- Vrije Universiteit Brussel, **SMIT** (Studies in Media, Innovation and Technology)
- Universiteit Gent, **IDLab**
- Universiteit Antwerpen, **Adrem Data Lab**
- imec, **EDiT** (Enabling Digital Transformations)

For more information about the project, visit our website www.serendipityengine.be.

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- Alexander Ververken (Schouwburg Kortrijk)
- Annelies Tyberghein (Stad Antwerpen)
- Michiel Vaes (KC Data & Maatschappij)
- Hans De Canck (FARI & VUB AI Experience Centre)

Introduction

The first stakeholder meeting aimed to establish a two-way dialogue between researchers and societal stakeholders to facilitate knowledge transfer from science to practice. We started the meeting by introducing the 4 research teams working on the project. Each team discussed their research topics and goals and briefly mentioned what we have been doing during the first months of the project and what we plan to do in the future. We also recorded this part of the meeting, so we can communicate its message to the stakeholders who could not be present.

Because of this introduction, the stakeholders gained a better understanding of the topic and scope of our project. Next, we gave the stakeholders the floor to briefly introduce themselves and what brought them to the meeting so that we could identify common goals.

Subsequently, we had two participatory sessions to get more input from the stakeholders. We prompted them to get more insight into the problems they are facing, the questions they would like to see answered, and opportunities to collaborate. Below, we present the course of the stakeholder meeting in more detail.

The presentation can be found as an **Annex** to this document.

Participatory session

Parallel discussions

Group A

During the brainstorming session, participants discussed possible collaborations between stakeholders from different domains, such as the Department of Media & Culture, Publiq, Anyways, and Kenniscentrum Data & Maatschappij. They talked about common issues faced by these stakeholders, such as governance, GDPR, budget, time, and falling behind in the fast progress of AI.

Several stakeholders were interested in conducting online studies on **how people spend their free time.** An important challenge here is complying with GDPR laws. Other parties showed interest in implementing recommendation algorithms to guide people through their event portfolio, but faced budget and time constraints. We also identified some possible collaborations between some of the use cases, such as working towards an "all in experience" that includes route planning and incorporates the destination event).

During the session, several other stakeholders were mentioned and could be invited to future events of the Serendipity engine. Participants suggested a "serendipity toolkit" to implement serendipity in each distinct interest domain.

As a side note, the app "StumbleUpon" was also mentioned as a "fun" idea that had sadly disappeared.

Group B

During the brainstorming session of group B, participants first briefly introduced themselves and subsequently started brainstorming with each other.

One of the topics that was discussed is the serendipitous route planner. One participant imagines this as something like the scenic routes that used to be present in the Michelin Guides where the scenic routes were indicated in a different color on the map. One of the elements of these routes is that you only knew which route was a scenic one, but not why. Hence, you expected to see something beautiful, but you were still surprised because you could not anticipate what. In order to construct these serendipity routes, there is an assumed need for feedback mechanisms that allow end-users to give feedback about whether the route did indeed stimulate serendipity. The importance of making a 'serendipitous cycler' profile is also stressed, to know whom to recommend this kind of route planning.

When talking about who is actually experiencing cities, one participant considers this as a two-sided concept. On one side, there are the inhabitants, and on the other side the tourists. One of the questions that was raised is **whether the 'experiencer' wants serendipity and what serendipity actually entails**. In case the 'experiencer' indeed wants serendipity, she wonders how we can stimulate it. Generally, local authorities collect a lot of data about the behavior of people in the city (they collect this through

booking.com, TripAdvisor, and Google to get to know their origin and experience), but they often do not know how to leverage this data in order to improve the experience of people in the city, for they probably could use somehelp.

One of the ways to cultivate serendipitous experiences, could be through personalized recommendations for cultural events. Several participants are active in this sector and do have data about the end-users. However, to have a rich catalogue of events, **the interoperability of different data sources might play an important role in the future.**

One part of the discussion was about how to get people to do things outside of their comfort zone. The participants agreed that people are reluctant to try things outside their comfort zone since they want certainty that they get value for their money and time. In our ongoing research, we notice the same tendency, but there is also a substantial proportion that likes to be surprised. One way to foster these experiences might be through recommendation systems, but also different business models could be an enabler. For example, a subscription instead of a pay-per-view ticketing system: Since you pay a fixed sum, you can take a risk and try something new without it posing the risk of wasting your money. Another line running through the discussion is how to leverage data for taste broadening and improving visitors' experience. They seek advice on how to do this on a concrete and technical level.

World Café Session

Communication

During this session, we discussed the different communication channels of our stakeholders and which audiences they target. Several of these might present interesting opportunities to disseminate our research findings and updates in the future. We also got feedback on what kind of communication channels we could use ourselves, and to what extent they would be useful for our stakeholder committee.

What question would you like us to answer during the project?

What is serendipity? How can you stimulate people to experience serendipity? Is serendipity even desirable? Designing for serendipity (designing for coincidence) might lead to negative experiences which are undesirable. How can we inform visitors (what are effective ways to reach them)? Can serendipity be planned/designed for? Do visitors want to experience serendipity consciously or unconsciously? What is the relationship between the project and the commercial sector? Tips for stimulating visitors online through e.g., atmospheric images? Can we even do something with it as policy makers/administration since it is such an intangible concept? Even if we understand the concept, is it useful since it handles the coincidental? We need to make serendipity tangible and have concrete arguments for why it is worthwhile to spend our time and effort on serendipity.

How do you effectively stimulate taste broadening? How do you get a hold of serendipity if it is such a personal thing? How do you also get niche content (low-budget and alternative content) in the picture?

What data can we use to cultivate serendipity? This points to the need to know what kind of data the stakeholders should capture in order to provide recommendations that could lead to serendipitous experiences. Which kind of model/recommendation engine do you use on this data? Both questions are related to the technical aspect of leveraging recommendation systems for stimulating serendipity. When does serendipity occur? During the anticipation, experience, or after the experience? This points to the difficulty to grasp what serendipity entails. Many, if not most, stakeholders indeed struggled with grasping what serendipity is. They ask for a definition to make it tangible and, in that way, make it operationalizable. What is the societal value of serendipity and how can we measure it (wellbeing and social cohesion)? Most of our stakeholders have a societal goal and are also subsidized by the government. To legitimize funding, for example, to experiment with serendipity, they also need something to show its benefit. What is the value for the user and other stakeholders?

Is there a serendipity function that scores better than a random function? What is the purpose of serendipity? What is its value for cultural organizations?

Can you score serendipity? Is the digital layer on top of our world (and hence making everything transparent and expectable) ruining surprise? Is this a threat to serendipity? What is the influence of this transparency effect of digital media on serendipity and can we design digital media in a way that avoids this pitfall?

Can you give people a serendipity score? This reflects the tendency in the culture sector to start to segment their audience into profiles. Has serendipity a societal value? Is it possible to measure serendipity? Although some participants' questions are critical, nevertheless many of them observe great value in the project since it asks critical questions about the technological advancements taking place in society and whether or not these are desirable, and how we can alter them if they do not seem to be desirable.

A lot of questions emerged during this discussion, which presents many opportunities for the project to start answering them. In the final part of this report we indicate how our work packages will answer (some of) these questions.

Any remaining ideas ('clear your head')

During this session the participants had the opportunity to discuss anything that they wanted to 'get out of their head' before returning back home. The participants mainly discussed the concept of serendipity and how it could be operationalized. **There were two conflicting ideas presented - one is that serendipity must be unguided, similar to the unbridled exploration of a child, and the other is that it must be guided, similar to the idea of an invisible hand or God guiding us.** Both notions included the central theme of unexpectedness. In the first idea, unexpectedness arises

due to pure randomness, whereas in the second case, unexpectedness is steered by something or someone.

Some participants raised concerns about the first notion of unguided serendipity, arguing that exploration would be suboptimal as it might include "irrelevant" experiences. However, other participants desired exposure to "bad" experiences as long as it enriches them in some other way. The question then becomes what people consider "relevant" and "irrelevant dimensions of experience". Some participants suggested the value of "emotions" in this regard, where a serendipitous experience can be "irrelevant" or "disliked" but must trigger some emotions, such as nostalgia. **The participants somewhat agreed upon a definition of serendipity as "apparent randomness that causes emotions."**

One participant saw a possible connection with research on "neurodiversity." It was not fully clarified whether this was in relation to the "serendipity experienced by neurodiverse groups" or as a possible "design route." The participant seemed to be interested in how neurodiverse people experience the world but was also drawing a parallel between algorithmic serendipity and "how neurodiverse people jump from one concept to another through relationships that may seem arbitrary to others". For example, "my grandmother was wearing a yellow sweater", "yellow is the color of the sun", "the universe is infinite, and stars die every day". This seems to suggest that algorithmic serendipity might be about uncovering relationships that "normal people" can't see.

Other related concepts were mentioned during the brainstorming session, such as "nudging" or "explainability," but participants had difficulty connecting these concepts to the concept of serendipity.

Main takeaways and next steps

Since this was the first stakeholder meeting, the main takeaways are questions from the stakeholders reflecting their needs and desires for practical knowledge to implement in their organizations. The participants from the Flemish government and the Knowledge Center Data & Maatschappij also posed high-level questions on the level of the society at large. We will present the main takeaways as three questions the stakeholders struggle with and link them to the work packages (WP) outlined in our project with which we intend to answer these questions and tackle these challenges.

First and foremost, the stakeholder meeting clearly points to **the importance of providing more clarity on what serendipity entails**. We need to entangle this complex concept and clarify what it means. The _Urban Serendipity Stories_ platform is one way in which we plan to do exactly that. In another study, which we are currently working on, we are building a theory to describe and explain how people discover the city is also very promising to make serendipity more tangible.

A clear description of serendipity in the city is pivotal for the second key takeaway, namely answering the question of why we should spend our time and money on

serendipity? Indeed, the stakeholders have asked on several occasions **what value serendipity has for users, commercial players, and society at large.** This is an existential question to the project on which we need to provide a clear and convincing answer. In our current study on how people discover the city today, we already gained the insight that many people value serendipity as a value on its own. Interviews with commercial organizations and insights gained through desk research also suggest value for commercial players. In **WP1** (understanding serendipity in a multi-stakeholder environment), the objective is to gain more insight into the value of serendipity. We will validate these insights through our pilot studies (WP5).

Although the stakeholders in general do believe in the value of serendipity, they want numbers to support its importance. Hence, the recurrently asked question of **how to measure serendipity**. Based on our insights gained through the Urban Serendipity Platform, **in WP4** we will build a tool to **measure serendipity and evaluate its impact** (T4.1 and T4.2). We will test this tool in WP5.

Third, and lastly, if serendipity is better understood, and has been shown to be valuable in several contexts, there still is the question of **how to cultivate or design for it**. This need of our stakeholders is often technical and concrete. How can they leverage their data and their digital infrastructure to build on top of it a recommender system which suggests serendipitous content? **Is it even possible to design for it?** These are the most challenging questions since they build on the answers to the previous questions. In **WP2** (data discovery on the web) and **WP3** (serendipity in recommender algorithms), we will tackle the technical questions which were asked during the workshops (e.g., which data do we need, how can we leverage the data we have for stimulating serendipity, what sort of recommender system do we need to stimulate serendipitous recommendations). In **WP4** (T4.3 and T4.4) we will investigate and provide an overview of the theory behind cultivating serendipity. We will provide an affordance feature repository that we link to contextual and personal characteristics which moderate serendipity. Furthermore, we will provide an Information System Design Theory which formulates in a structured way the design principles for developing an information system that promotes serendipity. This will respond to the need from the participants to look for a "serendipity toolkit" to implement serendipity in each distinct interest domain. Our ambition is to translate this into a workshop format that might be used by the different stakeholders when they want to design for serendipity.

Hence, we can conclude that, although the stakeholders have posed challenging questions, the tasks and work packages we have planned are well aligned with them and should be able to provide some helpful answers and insights for them.

Lastly, we also summarize the most important opportunities to boost the societal impact of our project. Firstly, regarding communication, we identified several opportunities to communicate together with our stakeholders. Besides, posting our activities regularly on LinkedIn seems to be an effective communication strategy as stated by several stakeholders. Secondly, several stakeholders state that they have a rich collection of data but do not dispose of the right know-how to create value out of this data.