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Serendipity is not bullshit

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ABSTRACT
Serendipity in the context of information-seeking and retrieval involves coming across information that is both useful and unexpected - either when looking for information on a different topic, when looking for information with no particular aim or when not looking for information at all. An article in The Stanford Daily newspaper, entitled 'serendipity is bullshit,' argues that there is little point in designing digital environments to support serendipity. We disagree. In this position paper, we respond to arguments made in the article and explain why it is very important that digital information environments should not only support users in seeking useful information, but also in encountering useful information unexpectedly.

Categories and Subject Descriptors
H.1.2. [**User/Machine Systems**]: Human Information Processing

General Terms
Design, Human Factors

Keywords
Serendipity; information encountering; information acquisition; chance

1. SERENDIPITY
The term 'serendipity' was coined by Walpole after a fairy tale – 'The Three Princes of Serendip,' in which the princes were *"always making discoveries by accidents and sagacity,* of things they were not in quest of.*"* [1]. Walpole highlights that *"***no** discovery of a thing you **are** looking for comes under this description (Walpole's emphasis)*"* [1]. The ambiguity inherent in Walpole's definition has, however, made serendipity a somewhat slippery and subjective term. This has resulted in a broad range of definitions – most of which incorporate the 'accidental' aspect of the phenomenon, but omit the 'sagacious' aspect. For example, the current Oxford Concise English Dictionary (11th ed.) definition is 'the occurrence and development of events by chance in a happy or beneficial way.' McCay-Peet & Toms [2] suggest that a definition that *"perhaps captures the spirit of serendipity as its creator, Horace Walpole… intended"* (p. 377) is that by Fine and Deegan [3], who define it as *"the unique and contingent mix of insight coupled with chance"* (p. 436).

We proposed an empirical model of the serendipity process [4] (see figure 1). In this process, unexpected circumstances combine with an insightful 'aha' moment to spark a mental connection. Forwards mental projections are made on the potential value of the connection and actions are taken to exploit the value. After an iterative process of projecting additional value that might be gained from the connection and taking further action to exploit the value, the process results in a valuable, unanticipated outcome.

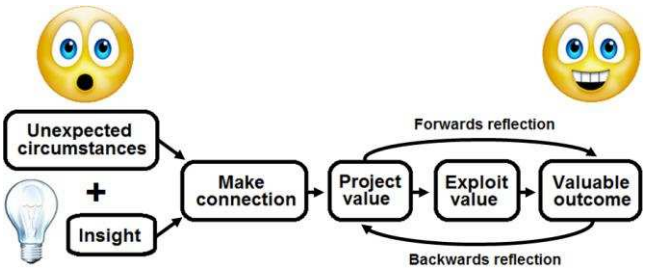

Figure 1: The serendipity process

Digital tools designed to support information seeking have become increasingly sophisticated in supporting users in finding information they are looking for - by including ever more precise search and browse functionality. However, there is scope for digital information environments such as search engines and digital libraries not only to support users in seeking useful information, but also in encountering useful information unexpectedly. In the context of information seeking and retrieval, serendipity involves coming across information that is considered to be both useful and unexpected when either looking for information on a different topic, when looking for information with no particular aim in mind or when not looking for information at all. Coming across information serendipitously has the potential to propel users in new directions that they are unlikely to have otherwise traveled in, potentially surprising and delighting them along the way.

Digital information environments can be designed to support these users in experiencing perceived serendipity by supporting functionality that can create opportunities for serendipity, such as recommendation engines (see [5]). They can also support serendipity by stimulating curiosity [6, 7], encouraging diversity [7], incorporating reasoning by analogy [7] and designing for strategies that people adopt to increase their likelihood of serendipity [8]. However, an article in The Stanford Daily newspaper entitled 'serendipity is bullshit' [9] argues that there is little point in designing digital tools to support serendipity. We disagree. In this position paper, we respond to the key arguments made in the article and explain why we believe that it is very important that digital information environments should not only support users in seeking useful information, but also in encountering useful information unexpectedly.

2. SINGH'S ARGUMENTS
2.1.1 *Serendipity is too often regarded as 'magical'*
Singh [9] argues that, particularly in Silicon valley, serendipity is often discussed in a 'magical' context, as *"*something that descends from the heavens to special people at special moments*."* Although we do not suggest there is anything truly 'magical' about serendipity, people often perceive their experiences of it as surprising or delightful [4], which suggests there is value in

designing digital tools to support it. Whilst 'serendipity by design' is too 'engineered' to be truly magical, there is potential for technology to result in user experiences that move beyond merely delivering user satisfaction to delivering user delight.

2.1.2 Serendipity cannot be courted

Singh's article is skeptical about the notion that it is possible to 'prepare yourself to be lucky.' However, Louis Pasteur's famous quote that 'chance favours the prepared mind' is not simply an addage; our empirical research [8] has found that people often adopt strategies aimed at 'making their own luck' – such as varying their routines, making mental space, being observant, looking for patterns, relaxing their boundaries, drawing on previous experiences and seeking opportunities. Digital information environments not only have the potential to support users in making connections between people, information and ideas but also in 'seizing opportunities' for putting that information to good use.

2.1.3 *Serendipity should be* 'eliminated'

According to Singh, serendipity should be 'eliminated from the world' because humans are fundamentally flawed in understanding probability, which means that they are *"*much more likely to notice the few times that serendipity happens to us than *all the times that it doesn't."* There may well be countless missed opportunities for every serendipitous experience, but we should not dwell on those. As an interviewee from our prior research [4] exclaimed, *"*9 of the 10 alleys you go down may be blind alleys. But the 10th *may take you somewhere wonderful."* Digital information environments should be designed to minimise missed opportunities by supporting users to make connections between material that they might not have made without support. Digital information environments should also be designed to help users notice potentially unexpected and valuable information that they might otherwise have missed.

Rather than 'eliminate' serendipity, we should embrace its slippery and subjective nature and recognise that there are different 'strengths' of serendipity [10] – from relatively minor occurrences of accident and sagacity (which have been referred to as instances of micro-serendipity [11]), to more profound occurrences. Do we really want to eliminate a phenomenon that has given rise to important scientific discoveries such as Penicillin, x-rays and even Viagra?

2.1.4 Serendipity should not be enjoyed

Singh states he has become *"*so disillusioned with serendipity that when it happens to me, I sometimes question whether it is even *justified to enjoy it."* It is easy to become disillusioned with this phenomenon if we deconstruct it to its essence, just as when a magician reveals his tricks. However, this does not make serendipity any less valuable; it serves as a 'stitch in time' and is an experience that is rare, but low-effort, high-reward. This value can and should be projected in the design of digital information environments. Imagine, for example, an interactive search tool that not only suggests the most 'relevant' hits based on the search terms entered, but also pages that are to some extent (but not directly) related to the terms entered - search for 'bars in London' and it might suggest not only popular but also quirky establishments such as The Mayor of Scaredycattown (a secret 'speakeasy' where we filmed a short video on designing for serendipity [12]). Such a search tool might initially surprise and delight users, but after frequent use, they might start to 'expect the unexpected' or 'become immune' to the enjoyment that serendipitous information acquisition can provide. One way of addressing this is to 'mix up' the way that suggestions are made – by providing a variety of different types of suggestion, made on different bases so users cannot easily 'see under the hood.' For example, a Google Scholar search on a particular academic might not only return papers written by that author, but also papers on similar topics written by others, papers frequently cited by the author, papers on methods commonly used by the author etc.

2.1.5 Technology should not support serendipity

Singh's article also suggests that designers should not create technology that leaves aspects of the user experience to chance. He argues that *"*good designers like to be completely in control of the experience they design. They want everything to be exactly how they intend*ed it to be."* [9]. Indeed, designers often aim to create interactive systems where a given set of inputs produce predictable outputs. They often want to be in control of exactly what the systems they develop do. At first glance, supporting serendipity seems to contradict this as it implies a lack of transparency between how inputs become outputs and unpredictable outputs themselves. However, even serendipity must be systematised when it is programmed into an interactive system (which is why designing to support serendipity has been described as a paradox [8]). Therefore, we argue that supporting serendipity does not force designers to relinquish control. Designers must accept that just as they are situations where users might want 'predictable' information (e.g. recommendations of other albums to listen to by the same artist they are currently listening to), there are also situations where they might want information that is less predictable (e.g. recommendations of music from a similar genre, but not by an artist they have listened to before).

Regardless of whether serendipity forces designers to relinquish control or not, we argue that not everything in life can or should be controlled. Information search is an example of an illusion of control. During a search, changeable inputs (search terms) produce an output (search results) which provide an indication of how the inputs may have been transformed to produce the output. However, information-seeking is inherently messy; there are 'unknown unknowns' (as Donald Rumsfeld put it) or 'anomalous states of knowledge' (as Belkin [13] put it) to contend with. We often do not know what information we need until we see it (and sometimes not even then). There is also no guarantee that we did not miss information that might have been more 'relevant' because our search terms were inadequate or used different terminology to that used in the 'relevant' document we missed. Coming across information serendipitously allows us to recognise that finding information is not as simple as an open search field implies - it is a dynamic, iterative process, where we often satisfice to compensate for the fact we are busy or in a rush. By relinquishing control and allowing some information encounters to be left partly to chance, we are in effect recognising the way digital information acquisition actually works - where any notion of 'control' is negated by the fact we are unlikely to read beyond the first page or two of search results or click on many pages where the title or result snippet do not provide sufficient 'information scent' [10] to suggest our time invested in searching might be rewarded with useful information. Singh argues that *"a designer that relies on* chance to get the user to accomplish any task is not doing his job *right"* [9]. We argue that a designer who thinks that information

acquisition does not already involve some elements of chance does not understand his job properly.

2.1.6 *Designing for serendipity is 'cheating'*

Singh also argues that designing to support serendipity is, effectively, 'cheating' by assisting a phenomenon that could be more powerful if left unsupported. Perhaps we might feel a greater sense of achievement when stumbling upon a useful book in a physical library (assuming the classification system had not assisted us in doing so) than if we came across a useful document unexpectedly when surfing the Web. But do we really feel that search engines are helping us cheat the information search process because the abundance of information on the Web has made many trips to the library redundant? Do we really feel that online dating sites are helping us cheat the relationship forming process? Technology has the potential to make life easier. Why not allow it to provide us with unexpected, useful information? What we should not allow is technology that provides us with serendipity 'on a plate' [8]. As André et al. [14] highlight, technology has the potential to assist users in making the mental connections that fuel serendipity. However, this must be achieved with care; we must support connection-making in ways that do not shift agency away from users; we must allow users themselves to have their own 'aha' moments (even if those moments are sparked through the use of technology). We should be aiming to 'create opportunities' for serendipity rather than to 'create serendipity' itself.

2.1.7 Designing for serendipity can destroy it

Singh's article suggests that designing for serendipity can destroy both its unexpectedness and pleasure – an argument that is not without support (see [15]). In particular, offering 'serendipity on a plate' may destroy both the unexpectedness and pleasure of serendipity. Users may no longer perceive information 'served up' by an interactive system to be unexpected, no matter if they were previously aware of it or not. Similarly, users might not feel as much pleasure as a result of a synthetic serendipitous experience as part of the delight of serendipity may well come from the making of the mental connection itself – having the 'aha' moment.

In the context of search results or suggestions, the notion of 'chance' results is an oxymoron as all results (even Google's 'I'm feeling lucky' ones) are returned based on algorithms. But in this context, it arguably does not matter if users perceive an element of true probabilistic chance in bringing back unexpected or diverse results. As serendipity is a highly subjective experience [4], while some users may lament the loss of this feeling of chance, others may not mind as long as the useful information keeps coming.

2.1.8 Serendipity is bullshit

Singh argues that *"*serendipity is, for the lack of a better word, bullshit.*"* We disagree. Serendipity in the context of information acquisition can provide us with new insights that can broaden our intellectual boundaries and spur creativity and innovation. It can act as a 'stitch in time,' providing us with low-effort high-reward gains. Serendipity is sacred. We should prepare our minds for it. We should seize opportunities that arise from it. We should design to create opportunities for it. Serendipity is not bullshit.

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