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VOLUNTEER-BASED ONLINE INFORMATION SERVICES TO INVISIBLE USERS IN UNDERSERVED CONTEXTS

ABSTRACT

This article proposes a conceptual model where the consumer of an information service is invisible to the service provider when using an online platform. The volume of information is increasing at an alarming rate and with the trend towards self-management of one's own health it is possible for people to seek information relevant to their needs. Without understanding the situation that causes the information need and how the information user as a cognitive actor makes sense of this need, the process of seeking information and how value is created towards an information goal, the provision of relevant quality information remains complex. An added complexity is the use of online platforms to facilitate the information service where users now interact with technology, information and humans through the platform. An existing online service provider, typical of a volunteer-based organisation in an underserved context, is used as the case. The article presents how the service provider uses the data generated by the system to understand the invisible user. The proposed conceptual model is derived from related literature and is used to present the empirical case.

Keywords: health communication; community communication; knowledge management; information service; invisible information; user; underserved contexts; volunteer-based information service

INTRODUCTION

In the digital world, information is continuously being produced, used and shared. However, there is a gap between data and value creation (Lim *et al.* 2018). The large volume of data available provides opportunities for value creation through data use. Currently, there is insufficient research describing the mechanisms to manage and utilise available data enabled by technology to create value in a service. It is

difficult to match the cost of providing the information with its value and therefore to recover the cost of its production, organisation and management (Kraaijenbrink 2008). Although young people generally are healthy, many are concerned about their mental health, substance abuse and well-being (Tao *et al.* 2017). Agosto (2019) indicates that more research is needed to understand the information behaviour and health communication practices of young people from their own perspective. Tao *et al.* (2017) state that not enough is known about how young people perceive the quality of health information on health-related platforms.

The aim of this article is to unpack the challenges experienced by a volunteer-based online information service provider to respond to its consumers' health information needs based on their experiences of adverse situations. These services typically operate in an underserved community context, which can be regarded as complex social ecosystems where the services available are inadequate for the needs of the people in such contexts (Joly *et al.* 2014).

The following research question guides this article: What are the elements of a volunteer-based online information service provider to respond to the information needs of people facing adverse situations based on data describing their information seeking behaviour? The article proposes a conceptual theoretical model to make sense of the alignment between the information needs of the invisible user (IU), where the users are invisible to the service provider, and the information available on the digital platform of the service provider. Although an empirical component is included to illustrate the practices of an existing volunteer-based service provider, this article is conceptual to represent the different concepts of information needs and the services of the information consumer as cognitive actor. Related literature was reviewed to determine the current state of information behaviour to ground the proposed model. The focus was on health information as many people prefer to manage their own health information (Tseklevs & Cooper 2017).

RELATED RESEARCH

The identified literature, based on relevant keywords, was coded using Atlas Ti to determine the concepts considered in this article. It is not a systematic review, but rather to consider findings that could inform this article. Saturation was also considered to decide whether more literature should be consulted. The following categories were identified to be discussed, namely information service as an example of a service enabled by technology; information service roles (consumer, producer, designer and custodian); content as information; human information interaction (HII); information context; and enabling technologies to facilitate the information service platform.

Information services

A service creates value and provides benefits to customers at specific times and places with customers often involved in the process. There seems to be a paucity of research about the mechanisms that could create value for organisations from data using the service available to them (Lim *et al.* 2018). An information service is a type of service

where information, as an intangible product, is provided with or without transforming it (Lim *et al.* 2018). A digital information service is where information is provided by the service provider to consumers to satisfy a need where the interactions are enabled by technology. Mathiassen and Sorensen (2008) view information services from a socio-technical point to consider how the configurations of people and information technology artefacts interact to support information needs for a specific purpose in information environments. According to Hovorka and Germonprez (2010), these represent mutable, loosely coupled and emergent interactions. Information processing is often associated with uncertainty and with different meanings and interpretations attached by the user of the information. It is not always possible to know the moment of use in advance and the situations that spark the need for information may be diverse (Kraaijenbrink 2008). The diffusion of technologies, and with more attention given to interface design, the ubiquitous use of processors, and the use of commercially applications have resulted in increased digital services (Mathiassen & Sorensen 2008). However, the value that the user gains from the information remain unclear.

Lim *et al.* (2018) refer to information-intensive service as where value is created through the interactions between the customers and the provided information, rather than physical and personal interactions with the provider. Customers use specific processes to find suitable information from different sources. Knowing the consumer's needs and processing preferences assist service providers in providing useful information. It is once the customers use the information acquired for a specific purpose that value is created. Service providers should also consider feedback mechanisms for them to know how the information was used and to what extent the customer's information need was satisfied (Hovorka & Germonprez 2010). It is difficult to establish the use value of online information because the users are invisible to the service provider if no feedback mechanism is included in the service to identify the user, for example, when paying for the service.

There are several quality concerns that could affect the value of the information, such as its level of completeness, representation, accuracy and timeliness. The findings of Zarraga-Rodrigues and Alvarez (2015) relating to the quality dimensions that affect the feeling of IUs of being well informed are accuracy, completeness and timeliness. Information quality is subjective because it depends on the specific situation and to what extent it helps the person to make sense of the information to satisfy a need (Diaz-Andrade & Urquhart 2010).

In an online environment, it is more problematic if the service is provided by a volunteer-type organisation that faces challenges to generate sufficient revenue to sustain its services. The cost of producing information may not be sustainable. Access to a diverse set of digital objects depends on economic and technological affordability and accessibility of individual IUs within a particular context as an integration between environmental, economic and social sustainability (Gobinda 2013).

The following components of information services are relevant to this article: service provider, customer as the IU, the information as the service that includes content, and the medium or channel of communication. In the information field the focus is

on where the entities such as information, people and technology intersect, interact and/or integrate and what the relations between the entities are (Madsen 2014). The following design challenges are considerations for the design of digitised information services, namely the content, use features, and revenue (Kraaijenbrink 2008). The provision of an information service requires the sourcing or producing of suitable information, the flow of information, content use features such as content-creation options, and data analysis tools to facilitate use (Kraaijenbrink 2008).

Information service roles

The roles of human actors involved in information services provision are the authors of information content, the information seeker as the IU, the designers of database systems, the human indexers, and the selectors of information relevant to the service (Lim *et al.* 2018). In this article, the focus is on the roles mentioned that focuses on the individual – communities or any other groupings are excluded. The following roles are considered, as proposed by Strong *et al.* (1997):

- ◆ IU - the “invisible” person who uses the information provided by the service,
- ◆ information custodian – the person who considers the quality and organisational aspects of the information provided by the service, and
- ◆ the information designer – the person who designs the information architecture, interfaces and applications.

With the increase of consumers also becoming producers of information there is a need to consider the role of the information “prosumer” (producer and consumer). In the case presented in this article, only the roles of the information producer, consumer, custodian and designer were considered.

Information consumer (customer of the service)

Health consumers are taking a more active role in managing their health (Tao *et al.* 2017). The IU of information is regarded as a cognitive actor with specific interests, a cognitive and emotional state, and perceptions (Robson & Robinson 2013). All of these are influenced by the context within which the person is situated. These authors propose different levels for using the information. On the first level the information satisfies their need and thus the information was relevant in the situation; on the second level the acquired information is understood and new knowledge is created, that is, the information has a cognitive impact; on the third level the information is applied to result in a lifestyle change and therefore the information was useful. It is therefore important to consider the cognitive, emotional and behavioural information outcomes to gain a better understanding of the IUs’ information needs and behaviour as they interact with the information service.

Important aspects in understanding IUs are demographic details; their experience in the area of their information interest; the significance, relevance and applicability of the information to them; and their belief systems and how these aspects manifest in their lived context (Robson & Robinson 2013). The sense-making process required by

the IUs is when they seek for information based on a perceived gap in their existing knowledge and the need to seek further (Diaz-Andrade & Urquhart 2010).

In the case presented in this article, the IU is a person perceived to be confronted by an adverse situation and their information needs are often about sensitive health topics or issues with associated stigma. Their preference to use this service is because they can do this anonymously. However, the problem is that being anonymous means that they are invisible to the service provider. This cognitive actor is therefore referred to as the invisible information user. This has an important impact on the service as there is no way that the service provider can determine to what extent the information obtained satisfies the information need.

Information producer, designer and custodian

It is important for the service provider to provide useful information to customers but in the healthcare space it comes with a risk. Information that is not moderated and quality assessed, or information presented in a manner that does not facilitate ease-of-use and understandability has the potential to make the situation worse for the information seeker. The information should therefore include additional information to provide alternative options, including links to other sources, emphasising the importance of seeking help from professionals, or guiding the IU in assessing the value of the information (Liu 2013). The service provider can use data produced by the system to determine user preferences, patterns of use, and trends, but most importantly to gain insights in the information seeking behaviour (Lim *et al.* 2015).

In the case of a service for the invisible IU it is prudent that the information producer assumes the responsibility of making sense of the information needs through other means, as with feedback mechanisms. In that sense the information producer as cognitive actor also makes sense of the suitability of information as perceived on behalf of the IU. The information producer is acting intentionally by continuously making sense through actions within the context of the service to not regard information as a passive object (Jones 2013). This is why we refer to this actor as the human sense-maker. It is important to “know” the target group, their perplexities, fears, perceptions, and in the case of underserved contexts also the literacy levels, socio-economic status, lack of access to information, cost and technology and infrastructural constraints, and to display cultural sensitivity. The challenges that the human sense-maker face that influence the quality and correctness of interpretation include previous knowledge, biases, and the ability to organise and present the information (Albers 2012). The sense-maker has to produce information in practice without the ability to consider the complexity of understanding the users (cognitive psychology); usability (human information interaction principles); and information architecture (visual communication, information design and technology applications) (Albers 2012). Information producers, who take the responsibility of creating quality information, appraise information differently from the IU, especially when they have different levels of expertise (Tao *et al.* 2017); for example, health professionals versus patients.

In a volunteer-based service organisation that is resource-constrained, the sense-maker may be the same person dealing with the technological aspects of preparing

and posting the information on the digital platform. It is possible that the same person is the author, creator, moderator, quality assurer and custodian of the information captured in the service provider's information repository.

Content as information

In most cases, information is regarded as processed data or data with meaning attached to it. We consider data as the information that is presented in some format available to the IU as the only thing that exists. Information then is the outcome of the IUs' sense-making process with mental models as part of a cognition process to internalise the data based on previous knowledge and experiences. Information is therefore the subjective outcome and is different for each IU. This resonates with Lim *et al.*'s (2018) consideration of data as raw materials, the ingredients of information and information, and then the outcome of a data analysis process. The emphasis should not be on the information *per se* but on the IU being informed (Jones 2013). It is possible to deliver information by guiding the IU to the potential value in the manner in which the information (data on the system) is presented and by the processing options. Data on the customers' information behaviour contributes towards a better understanding of the customers' information needs.

For the purpose of this article, the information object represents an instance of a real-world object that contains multiple data elements with the encoded values and attributes of that object (Gorichanaz 2016). Information objects appear in a variety of forms and formats accessed through different digital devices and interfaces, as they are stored on different platforms (Gobinda 2013). Examples of information objects relevant to this article are web pages; list of information categories; information in the form of articles about specific topics; quizzes; and chat logs. The use of the concept of an information object is not to objectify the concept of information as a "thing" but rather to distinguish between its static occurrences, as it exists independently from the IU, and as something with human involvement that requires agency to have meaning, that is, a social construct (Diaz-Andrade & Urquhart 2010). In the latter case, the information object that is sent to the IU still requires this person to make sense of it in terms of his/her information needs for specific situations.

Different people perceive the quality of information differently; this influences their perceptions of the usefulness of the information (Tao *et al.* 2017). Information has to be contextually relevant using language and terminology best understood by the persons using the information. The information and sources need to have a utility value (be useful, relevant, available, accessible and easy to use) and be credible (be trustworthy, have authority, be reliable and without bias) (Robson & Robinson 2013). Because quality is subjective, it needs the actual users' involvement to measure it and it is difficult when the users are invisible to the service provider.

The information object is acquired or delivered (for example, a webpage or an article) in a particular situation, which causes an information need as a perceived knowledge gap. The sense-making of the information is based on the information need to determine its value and is regarded as the "imbrication" between information objects, technology and users (Leonardi 2011).

Online human information interaction

Human information interaction (HII) aims to understand the complex social interactions of people's use of and reaction to information to respond to what meaningful and appropriate information means in specific situations (Albers 2012). It is important to understand how the IUs act and think while interacting with the information service and factors influencing the interactions (*ibid.*). The needs may not always be explicit as information is an abstract concept for most people and their needs may be ambiguous with shifting focuses as they engage with the information acquired from their seeking processes (Liu 2013). This engagement process deals with both the generating effect of the communication aspect of the interaction with the information, as well as with interpreting and using information (Albers 2012).

In digital services, the customer interacts simultaneously with the information on a technical platform and with social actors (Hultgren & Goldkuhl 2013). Information is acquired through a series of encounters with the information service towards achieving a goal that is linked to the initial information need, as information is fluid because it conforms to biases (Jones 2013). The information outcome of the sense-making process is the result of a number of negotiations between the IU, information needs, contexts, and experience in a specific situation. It could be useful to consider the experiences of the IUs with the situations, gaps in knowledge and assistance needed in understanding their information behaviour.

Information seekers need information from their perspective of a need that stemmed from their own situations and the seeking process can be regarded as “constructing cognitive bridges” across these perceived information gaps (Diaz-Andrade & Urquhart 2010). The information seeking process is motivated from a purpose that aims to address the information need. This happens when the IU recognises that his/her existing knowledge is inadequate to satisfy a specific goal when facing problems influenced by a range of social factors (Ormandy 2010).

Information context

Agerwal *et al.* (2009) argue that it is important to unpack the circumstances, as the context, that led to the information need in order to understand the context as a socially defined setting rather than just the setting of use. The difference between a context and a situation is that contexts can be regarded as frameworks of meaning, whereas situations are the dynamic environments within which humans operate that influence the manner in which they make sense of their circumstances for which information is needed (Agarwal *et al.* 2009). A context can have several settings and includes location, social influences (Robson & Robinson 2013), and factors associated with underserved contexts.

The information delivered by the service provider needs to be contextually relevant to the IU. It must be in a language understood by the IU, culturally and gender sensitive, and in underserved contexts, consider aspects specific to such contexts. In the role of sense-maker, the creators and publishers of the information need to understand the information behaviour of the information seekers who will be influenced by the context.

Context, as a socially defined setting, is subjective; in a person-centric view of information seeking it can be regarded as the outcome of a natural process of human cognition (Agarwal *et al.* 2009). The authors refer to the three views of context as the personal, shared and contextual stereotypes and, in terms of this article, it means that the human sense-maker producing the information is outside the context of the IUs. Human sense-makers operate within their own personal contexts but have to make sense of the contexts of the IU's own personal context without being part of it (Robson & Robinson 2013).

In the underserved contexts, which often are resource-constrained, information providers have to use resources available to them without the option of using resources that improve the quality of information (French & Williamson 2016). The authors use the term "bricolage" to refer to the practices of creating something new, only with materials and resources already available to the person. This means that the human sense-maker gradually accumulates knowledge about the nature of the information, tools and materials to produce and organise the information in a series of unplanned information practices or a recombination of the available resources. This allows the human sense-maker to respond to a specific information need immediately, as part of the provided service.

Often in underserved contexts the value-driven services available are provided by volunteer organisations who continuously struggle to survive (Warwick *et al.* 2014). People in underserved communities struggle with connectivity, in some cases a lack of electricity, and with limited digital literacy. These resonate with access, literacy, decreasing disparity, health, happiness and well-being outcomes considered in underserved contexts. Cultural issues associated with specific contexts contribute to challenges experienced in service provision, especially in low and middle-income countries. The design of such services should provide for sense-making of the aspects important for the service provided in such contexts (Cipolla & Reynoso 2017). Manzini (2015: 35) states that designers can be regarded as "producers of sense, or sense-makers", where such people integrate their own experiences and knowledge into their understanding of situations that could influence the service.

One can refer to an IU as a person-in-context, as his/her information needs are motivated by a range of situations that influence what happens to him/her, his/her circumstances, and his/her responses at a specific point in time. This in turn is influenced by the wider context of the environment (Ormandy 2010).

Enabling technology

Digital services are defined as "services that that are obtained and/or arranged through a digital transaction (information, software modules, or consumer goods) over Internet Protocol (IP)" (Williams *et al.* 2008: 506). The service experience is influenced by the social interaction between users over an IT platform (Hofemann *et al.* 2014). Technology, such as the internet, computers and smart devices, can be seen as service enablers and can provide services in new ways. The introduction of digital technologies in service provision creates new innovation opportunities, but a holistic

understanding is needed across the dimensions of the service provider's services, the digital environment, and the organisational properties (Nylén & Holmström 2015).

Information technology digitises the information and interactions between the IU and information within a service to facilitate value creation (Lim *et al.* 2018). An information service requires a set of informational, human and technical components to facilitate the creation and organisation of information and the touch points for the IU to interact with the information service. The enabling technology does not replace human-to-human interactions because the IU will interact with the platform and with the social actors of the SP at the same time (Hultgren & Goldkuhl 2013).

A proposed online information service conceptual model for volunteer-based organisations in an underserved context

There is a lack of information theories that can assist to understand, design and implement information services in organisational contexts (Mathiassen & Sorensen 2008). The proposed conceptual model is based on the information-seeking, retrieval and behavioural processes model of Robson and Robinson (2013), which they conceptualised based on other information behaviour models.

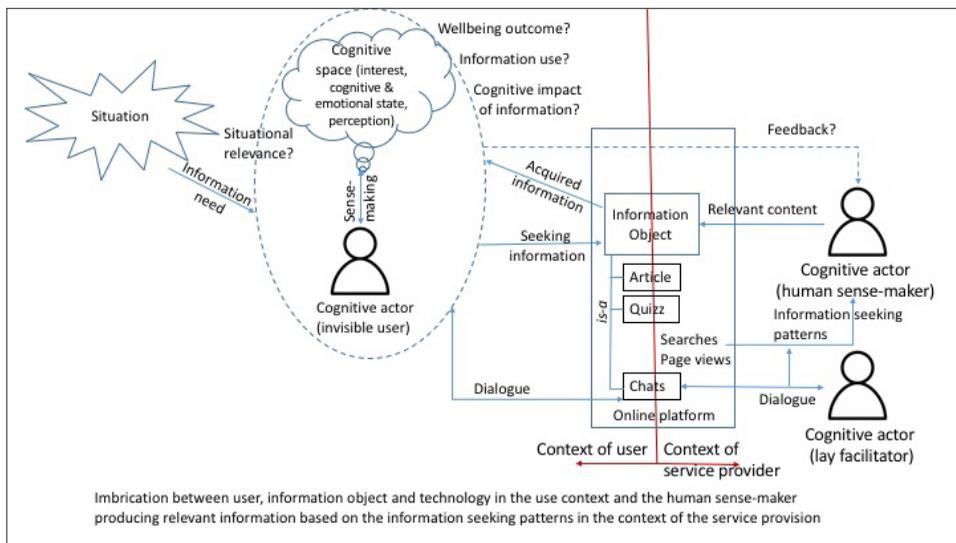


FIGURE 1: PROPOSED CONCEPTUAL ONLINE INFORMATION MODEL FOR INFORMATION SERVICE PROVISION IN AN UNDERSERVED CONTEXT

Source: Adapted from Robson and Robinson (2013)

In the proposed conceptual information model (Figure 1), three cognitive actor roles are indicated for a volunteer-based online service. The red line separates what is

visible to the different actors who can only see what appears on their side. The IU has an information need based on a specific situation. Part of him/her making sense of the situation is to recognise the information gap, and, influenced by his/her interests, emotional state, perceptions and experiences, begin the information-seeking process. He/she can do this in different ways, but in the case of the volunteer-based service provider, he/she can consider the different information options, such as articles, quizzes or chats, as he/she browses the web pages guided by the online platform. Once he/she decides on specific information, he/she can read the relevant articles, complete quizzes, or chat with a facilitator. His/her information behaviour will be influenced by his/her personal contexts that are influenced by factors of the wider contextual environment. This context is invisible to the service provider. The context of the service provider may also be invisible to the IU, but can be made known through the “about” information published on the web page. The value of the acquired information, to what extent it is useful, and whether it changed behaviour are important for understanding IUs, but as long as they are invisible to the service provider this cannot be done without their actual personal involvement.

The service provider provides an online service, which includes an information service with the involvement of volunteers. The cognitive actor needs to make sense of the perceived information needs, information behaviour and perplexities of their customers, in this case an IU. This sense-making process will be influenced by the human sense-maker’s context, the operational context of the organisation providing the service, and the socio-economic realities of the people in an underserved context. The information available to the human sense-maker is what is obtained from the system, such as searches, Google stats, geographic distribution of locations, demographics, devices used, articles viewed, quizzes completed, average time on a page, repeat visits, bounce rate, and exit percentage. The qualitative data available are the chats that provide a dialogue between the IU and human facilitator.

This conceptual model can be used to consider the human information interaction between invisible users of online information services and the response of the service provider to provide relevant information. It is important to understand the sense-making process of all the cognitive actors in bridging the gap between the perceived information need and the desired information outcome.

METHODOLOGY

This article only considers the information provision aspect of the online counselling service provision and not the actual online counselling. The following data sources were used: page view statistics obtained from Google Stats; and the information published on the online platform, such as the web pages, information categories and information objects (such as articles and quizzes). A chat log was obtained from the service provider of a number of actual chats. Unstructured interviews were conducted with the two people volunteering their time and expertise for the service. Ironically, although the importance of knowing the information seeker and understanding their circumstances and information behaviours is confirmed by the literature, it was not possible to engage with actual IUs as they use the service anonymously (therefore the

decision to refer to them as IUs). In that sense we had to base our understanding of the IU on the information that the SP uses to produce relevant information based on their understanding of the need. The following are presented: page views of the use of the service; the focus was on health information and the health page views were coded to organise them into health themes relevant to the service. The actual articles published on the online platform were read to determine how the information responds to the identified needs based on the page views. The articles read by the IU, and whether the information need was met, fall outside the scope of this article. A specific chat was selected to illustrate how the personal contextual information could be obtained. An extract of a related journal article is also included to illustrate a possible response to the need identified in the chat. Then, the specific case is discussed using the conceptual framework.

THE VOLUNTEER-BASED INFORMATION SERVICE PROVIDER CASE

The service provider is an NGO in South Africa that has been in operation since 2010. They base their service on the following service differentiators: anonymity; free service; real-time action with permanent access to information and scheduled chats; easy access; text-based (to save costs and to cope with limited connectivity); life skills facilitation (when needed and referrals to professionals); and no discrimination. They have counselled more than 186 000 people and currently receive approximately 8000 visitors per month on their current platforms. The service is provided by an NGO that takes care of the recruitment of volunteer facilitators and professional experts. The NGO also provides training to the volunteer facilitators as lay counsellors. Furthermore, relevant information articles and quizzes are designed as a response to the typical issues identified through the service and are always available on the internet, mobile web sites and application. A software developer volunteers his time to develop new information technology components for the IT platform and maintains the current system to enable the services.

Information use data

Table 1 presents the page views for the period of 1 January 2016 to 10 September 2018 to provide an overview of the services provided and the people seeking advice.

TABLE 1: PAGE VIEWS SUMMARY

Service accessed	Page views	%
Total	1,294,650	100.00
Articles	661,610	51.10
Quizzes	233,719	18.05
Chat	98,593	7.62
Other (help, services, groups, etc.)	300,724	23.23

Figure 2 provides a breakdown of the most viewed topics.

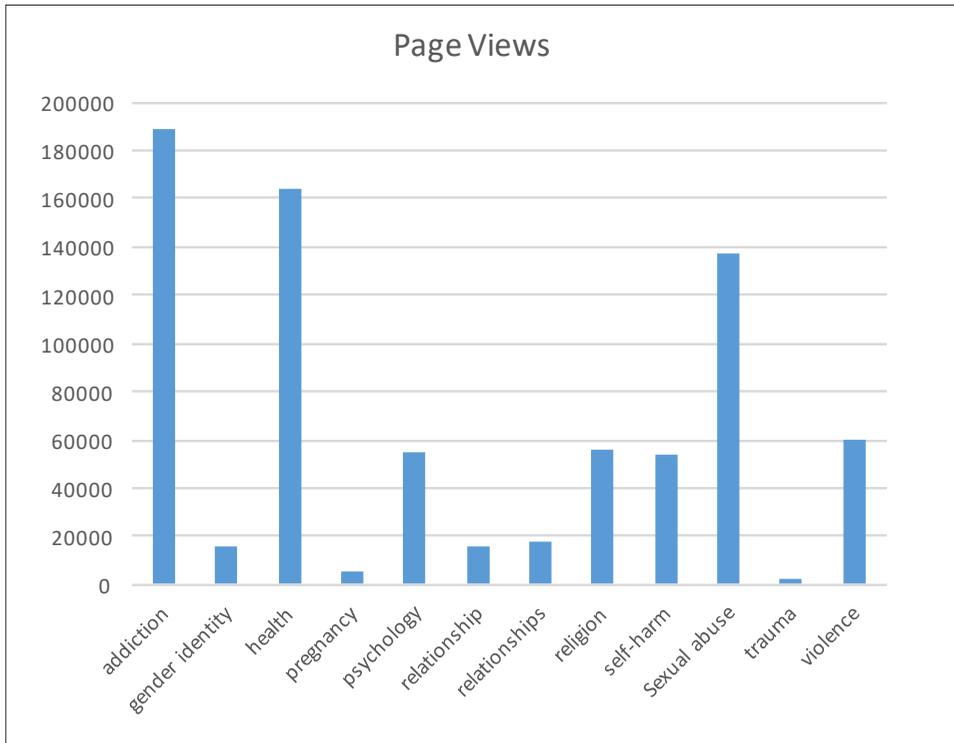


FIGURE 2: THE DISTRIBUTION OF SEEKING FOR INFORMATION OF THE ISSUES ON THE WEBSITE

The information categories were decided by the human sense-maker and developer for the service provider and the creation of new categories, or re-categorising, happens in response to the information issues encountered during the service. This is a good example of information bricolage. Figure 3 presents an example of the categories that appear on their landing page; each has a hyperlink that will list the articles for that category when selected.

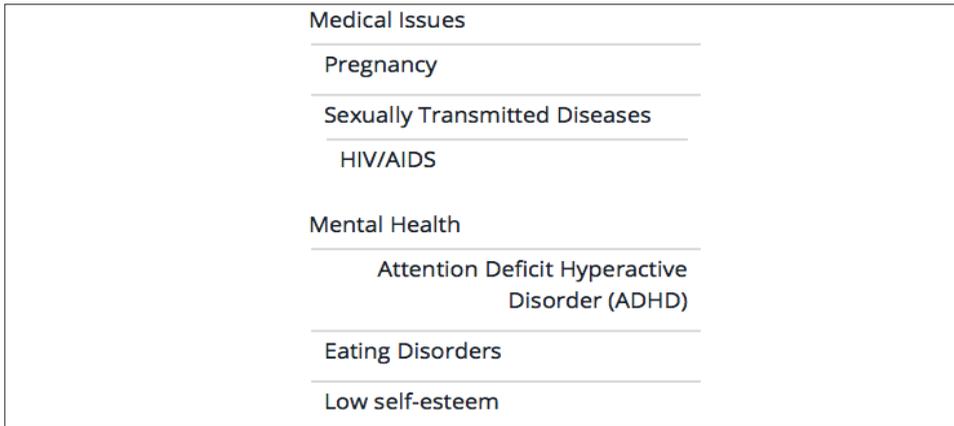


FIGURE 3: INFORMATION CATEGORIES

PERSONAL ISSUES

Are you afraid of being alone?
Are you afraid of being alone? Loneliness, being alone – Isn't it weird that more people feel isolated and alone...

SEPTEMBER 1, 2019
Online dating: Dangers & safety tips

AUGUST 12, 2019
Teen dating violence

AUGUST 7, 2019
Warning signs of an Abusive Relationship

MENTAL HEALTH

How news & fake news is messing with our brains
Does news & fake news effect our mental well-being? Never before in the history of mankind have we been bombarded...

AUGUST 7, 2018
Suicide – it shouldn't be a secret

SEPTEMBER 3, 2019
Unemployment & Depression

AUGUST 26, 2019
10 things to do when you are lonely

ADDICTION

Spice

- > How to Stop Enabling an Addicted Loved One
- > Anabolic Steroid Addiction
- > Love Addiction

ABUSE

Cyber Bullying

- > Gender-based Violence
- > Abuse: Can an abusive partner really change?
- > Rape

FAMILY / COMMUNITY

Did you grow up with toxic parents?

- > Gangsterism
- > How to Get Your Daughter to Talk with You
- > Lolly Lounges

FIGURE 4: EXAMPLE OF WEB PAGE WITH RELATED INFORMATION

The information architecture has a relatively flat structure. All the articles for a category appear on the web pages, introduced with a photograph, and an introduction of three lines of the content.

The articles were updated from July to September 2018, and new articles or article updates were uploaded as recent as September 2019. Figure 5 is an example of the responsiveness of the service provider.

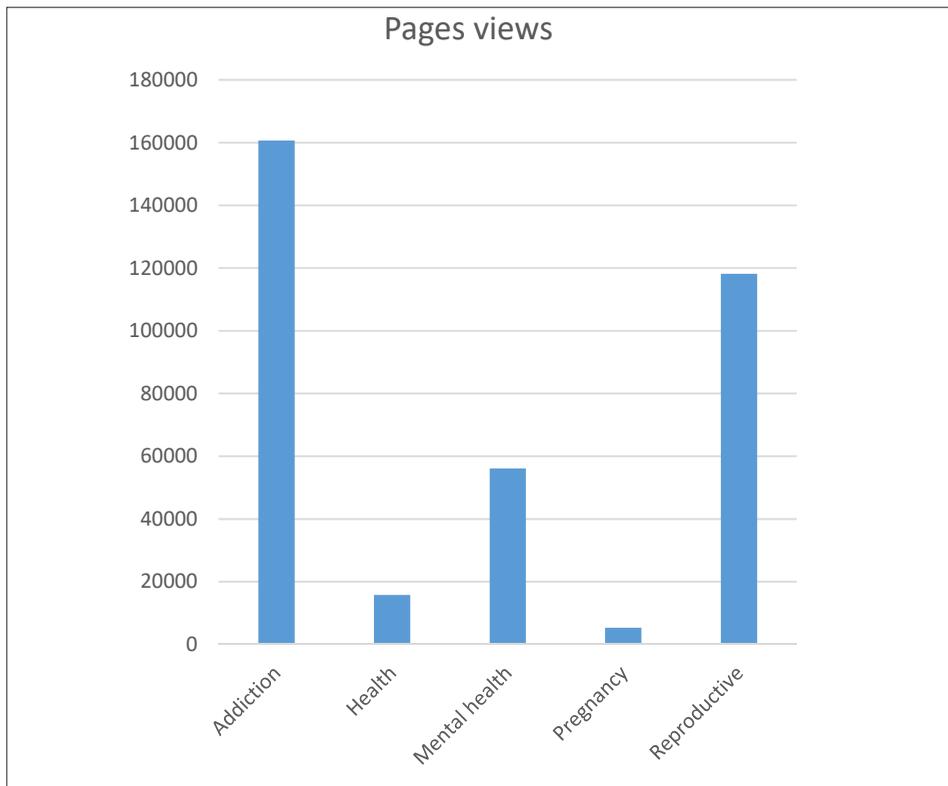


FIGURE 5: PAGE VIEWS OF ARTICLES DEALING WITH HEALTH-RELATED INFORMATION ISSUES

The three major categories based on the page views are presented next. The topics are associated with sensitive issues, or are associated with stigma, and could be a reason why anonymous services are preferred. Addiction is the health category mostly viewed and the specific topics are typical of a context affected by social ills, such as alcohol, inhalants, mandrax, marijuana, methamphetamine, methcathinone, nyaope, sizzurp-lean and the-root-of-addiction. The next health category mostly viewed deals with reproductive health, with the following topics: abortion, chancroid, chlamydia, contraception, circumcision (male and female), genital-herpes, gonorrhoea, human papilloma virus, male-circumcision, pubic-crab-lice, STDs, syphilis and trichomoniasis.

Next, the topics of mental health are: borderline personality disorder, depression, eating disorder, hyperactive disorder, low self-esteem, post-traumatic stress, self-harm and suicide.

The articles that appear on the website that deal with addiction also use the “street name”, e.g. Marijuana/dagga, Methamphetamine/TIK, Methcathinone/KHAT, and Nyaope/Whoonga. Most topics have only one related article on the website with the exception of addiction, namely the science of addiction, its roots, about it, to recover (online services) and steps to recover; depression with three articles; one about depression in women and depression when unemployed; post-traumatic stress with three articles; one about trauma; one about trauma associated with the past and post-traumatic stress; circumcision; one about female circumcision and one about male circumcision.

The content of the articles is analysed in terms of their quality, relevancy and completeness. At this stage, it should be noted that the language used is easy to understand by non-health professionals and the terms used are everyday language as derived from the chats. A more in-depth analysis is still required to analyse the quality of the information on the online platform and to determine the actual value created for the IU affected by a specific situation.

Articles are examples of information objects with content produced by the information service provider and are one-directional (one-way communication), responding to an information request. Quizzes are information objects that allow a dialogue (two-way communication) between the system with pre-set questions and answers provided by the IU, concluding with an outcome and directives for the IU to consider. Again, there is no feedback mechanism to establish whether the follow-up did in fact happen.

The page views for the quizzes confirm the trend towards self-management of one’s own situation. The high page views of mental health are evident of this.

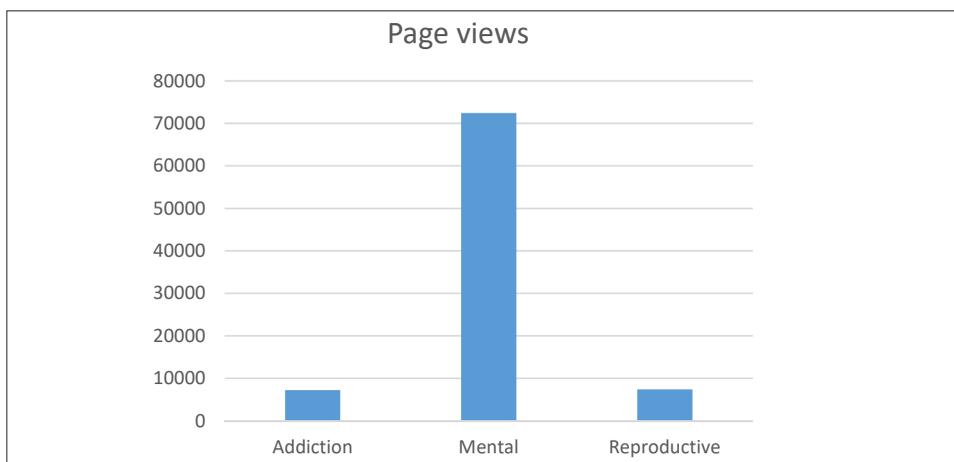


FIGURE 6: PAGE VIEWS OF ACCESSING QUIZZES TO BE INFORMED ABOUT A TOPIC

2019-04-10 12:03:29 IU: *Is having a drinking Budget a sign of alcohol addiction?*
2019-04-10 12:03:34 Live Support: *Welcome to SP Counseling. How can we help?*
2019-04-10 12:04:30 Live Support: *Apologies for the delay. A facilitator will be with you shortly!*
2019-04-10 12:13:17 System assistant: *SP has accepted the chat!*
2019-04-10 12:13:33 SP: *It depends - how much do you drink per week?*
2019-04-10 12:14:00 SP: *It could also be sign of financial sense to budget*
2019-04-10 12:15:39 IU: *If you Only Drink during the weekends but your budget for going out is a bit higher than the grocery budget?*
2019-04-10 12:16:48 SP: *can you give numbers on how much on average you drink on a weekend?*
2019-04-10 12:19:35 IU: *Not quite Sure About the numbers But it's Usually 24 Pack of Cider and a Bottle Gin with my 3 Friends.*
2019-04-10 12:22:31 SP: *would you say you binge drink on weekends?*
2019-04-10 12:24:41 IU: *I can say so although we normally on which day are we going to drink on friday or Saturday.*
2019-04-10 12:25:04 IU: *we normally decide**
2019-04-10 12:26:17 SP: *for men the max amount of alcohol per week is 14 units. whether you take it in one go or spread out over a week. more than that is red flags.*
2019-04-10 12:29:02 IU: *And how Many Units do I drink?*
2019-04-10 12:31:00 SP: *218 ml of cider counts for one unit*
2019-04-10 12:31:18 SP: *25 ml of gin counts for one unit*
2019-04-10 12:31:54 SP: *You shouldn't regularly exceed 14 units.*
2019-04-10 12:40:21 IU: *So by Just 6 Cans of 440ml cider I'm already at 12?*
2019-04-10 12:40:44 SP: *yes.*
2019-04-10 12:42:18 SP: *It is good t know this and be aware of it. It is very easy to slip into a drinking pattern that is expensive and could become an addiction. Because no one tells us the exact amounts. They just say dont drink too much*
2019-04-10 12:45:40 IU: *Yes It is.Thank you For your assistance.*
2019-04-10 12:46:55 SP: *you are welcome*
2019-04-10 13:14:04 System assistant: *has closed the chat!*

FIGURE 7: EXAMPLE OF A CHAT DIALOGUE BETWEEN AN INVISIBLE USER AND THE SP

Even though the chats are anonymous, with both people using assumed names, the names used in the actual chat were changed to “IU”, for the person seeking for information, and “SP” for the person providing the information service.

When analysing the text of the chat it is possible to gather some information about the person’s personal context. The person is concerned about drinking too much and described the situation that caused the need. The facilitator is able to provide answers or prompts to obtain more information about the perceived need. Although social drinking is accepted in some contexts, the person is indicating concern about it becoming a problem. Although this is an example of a short chat, more details can be

obtained from longer and recurring chats. The person feels free to discuss the problem knowing that it is anonymous.

Figure 8 is an example of the first part of an article that provides information about consuming too much alcohol. This can be regarded as a response to the information need expressed in the chat example above. The value add is that additional information about the topic is added to provide more complete information to a wider group than just addressing the issues mentioned in the chat. The human sense-maker uses information highlighted as needs from chats as triggers to create articles and quizzes, but then adding sufficient information to cover all aspects of the topic.



Alcohol – am I drinking too much?
BY MOBIEG ON JULY 9, 2019
TYPES OF DRUGS

Alcohol – am I drinking too much?

Alcohol abuse **never** just affects one person – **it affects families**. There is hardly a family that hasn't been touched in some way: whether you're the child of an alcoholic or someone who has been punched on a night out, the fetal-alcohol-syndrome baby of an alcoholic mother, the abused spouse – there are so many examples. It is unusual to come across a family where someone hasn't been affected by alcohol.



Alcohol is the drug of choice among youth. In South Africa drug and alcohol abuse is **double** the world norm. That makes us a hard drinking country.

What is considered heavy drinking?
Men: 4 or more drinks / day or more than 14 drinks / week
Women: 3 or more drinks / day or more than 7 drinks / week

FIGURE 8: AN EXTRACT OF THE FIRST PART OF AN ARTICLE WITH INFORMATION ON ALCOHOL ABUSE

DISCUSSION AND CONCLUSION

Considering the nature of an online IU there are many challenges in understanding the information behaviour of the consumers of the service. The fact that the users are invisible to the service provider is a major challenge, as the service is built on providing the consumers with anonymous access. The type of issues for which information is needed is typical of an underserved context where the IUs are negatively affected by the social ills of their context. There is a need for such a service, especially because the people in underserved contexts are also not able to access or afford professional services, which are situated in more resourced settings. The sensitivity of the issues and the associated stigma of the issues mostly interacted with means that there is a need for an anonymous service, which allows people access to information and assistance that they are hesitant to discuss face-to-face. The number of people using it confirms the need for an online information service and the service appears to meet the needs of the people using it. However, the current service model is not sustainable and an appropriate business model needs to be created.

The most important cognitive actor in this service is the human sense-maker, who is continuously making sense of the needs of the people to respond with information that could be used by their customers. In a volunteer-based service, there is not the luxury of resources to assist with the production, dissemination and organisation of the information. This service has published at least 106 articles for the three main categories, which are continuously created and updated. The human sense-maker is not only the producer of the information but assumes the role of information designer, quality assurer, moderator and custodian. The human sense-maker does this without any assistance or training. This is a good example of the continuous actions of bricolage to respond to the perceived information needs and behaviour of the IUs.

The information provided on the online platform is unique in the sense that it responds to real issues, as experienced by IUs. However, it is necessary to assess the quality of the information to ensure that optimal value is achieved from the information. The quality assessment needs to be done by someone with expertise to measure it, and with an understanding of how it can be used differently by different persons and in different situations. The current information repository could be a useful source for organisations providing support services, for training institutions for real-life cases, and for researchers to gain more insight in the information provided to online IUs.

The use patterns are an indication that most of the invisible users are situated in underserved contexts and they are the ones who can benefit most from such a service. However, the current understanding of the information behaviour gained from the available data is insufficient to understand the information needs of the IUs and it is difficult to establish whether any benefit was gained from the information on any of the three proposed levels. Without this ability to gain insights in the IUs' information behaviour, any assessment of impact is impossible. This is the biggest concern, and it is necessary to find mechanisms to address this aspect.

More studies in human information interaction are needed to utilise online platforms optimally and ultimately to assist those in need. It is important to make the IU more

visible to the service provider and technology. Although powerful analytics and machine learning offers some possibilities, the human aspect needs to be considered; for that the IUs must participate in research for their own voices to be heard.

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