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Living the Good Life: How Content Providers can Better Conceptualize the Content Requirements of the Ubiquitous Technology User

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Abstract

Content provision via ubiquitous technology platforms such as smart mobile phones and personal digital assistants raises interesting practical and research challenges. Many current theoretical frameworks and models are based on assumptions which may not necessarily be valid in the case of ubiquitous technologies, which users employ in a variety of contexts and for different reasons. In this research-in-progress paper we explore how content providers can better conceptualize the content requirements of ubiquitous technology users. We introduce the principle of Continuous Quality of Life Optimization as a theoretical concept to understand the content requirements of these users. We put forth a number of propositions to guide further research and provide details about our own research approach, in which we are exploring ubiquitous content provision from the perspective of content providers.

Keywords

Ubiquitous content provision, quality of life, technology acceptance, usage, mobility

INTRODUCTION

Smart mobile phones and personal digital assistants (PDAs) are increasingly commonplace in work, leisure, and social contexts. For many individuals, the vision of ubiquitous computing (Davis 1989; Lyytinen and Yoo 2002; Weiser 1993) has become a reality today. The widespread global adoption of these technologies has in turn opened up new emerging markets and commercial opportunities for content providers (Andersson et al. 2006; Tilson and Lyytinen 2006).

Content provision via ubiquitous technology platforms raises interesting challenges from both practical and research perspectives. First, users tend to have these devices with them for most of their waking hours (Watson et al. 2002). This stands in contrast with the assumptions that can be made in the case of more traditional computing scenarios which tend to be associated with a particular physical location (e.g. desktop computing at the office). Second, providers of content via ubiquitous technology face particular challenges in considering user requirements. This stems from the fact that it is difficult to contact individual users/user segments (who could number in the millions) to solicit feedback. It is also the case that many users are resistant to supplying feedback to ubiquitous content providers (Andreason 1965; Blackwell et al. 2001). Lastly, many current theoretical frameworks and individual acceptance models assume technology and content are used for a specific purpose and a particular domain of use (e.g. calendar and group scheduling applications at the office). Such assumptions are not necessarily valid in the case of ubiquitous technologies which users employ in a variety of contexts and for different reasons.

In this research-in-progress paper we define ubiquitous content broadly and inclusively to denote applications, functionality, information, and services that are available via ubiquitous computing devices such as smart phones and personal digital assistants (PDAs). We thus draw distinctions between these and other types of content and services which are bound to a particular location (e.g. the home or the office), or a specific purpose (e.g. content in an enterprise system). We also position ubiquitous content as inherently personal, i.e. the unit of analysis is largely the individual (Watson et al. 2002). Under this definition, the value of content is as perceived by the

individual. Hence, it is important for content providers to understand user value perceptions of content and ultimately what individuals would be prepared to pay for.

This paper deals with the fundamental research question of how content providers can better conceptualize the content requirements of the ubiquitous technology user, which will vary depending on the particular time, physical location of the user, and possibly a wide range of individual specific factors.

In this paper we introduce the notion of the *Continuous Quality of Life Optimization* principle (CQoLO). We argue that this principle is more informative than rival notions (such as *demand-pull* and *technology-push* approaches which are advocated in the literature) to conceptualize the content needs of users of ubiquitous technology. The paper is structured as follows: first we review the literature on current approaches to ubiquitous content provision. We then present a series of scenarios to illustrate the limitations of these approaches. Next, we propose the CQoLO principle as a concept which we argue better informs content considerations from the perspective of ubiquitous content providers. Finally, we discuss the merits of the new principle and how it could be operationalized in further research.

LITERATURE

From a content provider perspective it is important to understand how users of ubiquitous technology perceive content. In this section we define ubiquitous computing and explore current approaches to ubiquitous content provision, user perception, technology diffusion and acceptance. We highlight some shortcomings and limitations in the literature in terms of ubiquitous content provision.

Ubiquitous computing defined

Lyytinen and Yoo (2002) define ubiquitous computing by contrasting it with mobile computing and traditional business computing (e.g. desktop computing). In contrast to the static location associated with traditional desktop computing, mobile users take computing and communications technologies with them, but the underlying computing model does not considerably change as the user moves. Ubiquitous computing goes a step further, taking into account the context (e.g. physical location, time) and dynamically configuring the kind of content and services as appropriate. For example, the content that would be available via a ubiquitous computing device at a certain place and time, would likely be different in another place and time, for the same device.

Current approaches to ubiquitous content provision

The dominant approaches to content provision via ubiquitous technology platforms are focussed upon utility (the condition of being useful and therefore profitable). Within this utility paradigm, two common approaches are adopted by content providers to determine user requirements. These are the *demand-pull* and *technology-push* approaches.

The *demand-pull* approach promotes the creation of content according to actual customer demand. In this model, user feedback underpins planning, controlling and delivery of content (Andersson et al. 2006). In effect, customers are seen to be *pulling* content towards them, based on existing needs. Alternatively, the *technology-push* approach promotes the creation of content according to expected customer demand. In this model, an understanding of user expectations and perceptions of value underpin the planning, controlling and delivery of content. In effect, the supplier is seen to be *pushing* content towards the customer in anticipation of future needs (which users currently may not be able to articulate).

In both cases, the user is seen as a *customer/consumer/receiver* of content whose requirements can be known (by themselves and by others) in order to provide content. In the ubiquitous technology arena the remoteness of the user, combined with statutory constraints (e.g. “do-not-call” legislation) and also the limitations of the device itself (small size, cumbersome input) make it difficult to solicit user/segment feedback. It is also the case that many users are resistant to providing feedback to ubiquitous content providers (Lapointe and Rivard 2005). Given that user circumstances are continuously and subconsciously changing in every instance, even the users themselves may not know or be able to articulate their requirements from one moment to the next – their requirements will be highly specific and personal as they arise.

For these reasons, we argue that the traditional *demand-pull* and *technology-push* approaches cannot be comfortably applied to content provision via ubiquitous technology platforms. Furthermore, the advantage of the *technology-push* paradigm (that it is seen to provide an approach to the provision of previously unimagined content and services in an untried marketplace) must be weighed against a high risk of failure – the assumption that “if we build it, they will come” has been the downfall of many prospective services in the past (e.g. Iridium, etc.).

Traditional content provision theories and literature describe the marketplace as being made up of segments (Kotler and Armstrong 1996; Scheepers 2006). In the ubiquitous computing era, these segments are based upon demographics such as age, gender and disposition toward the technology (Lee and Brown 2008; Rogers 1995). User behaviour in the ubiquitous computing arena is however beginning to contradict these stereotypes. Illustrations of these deviations are given in the scenarios section below. We argue that user perceptions of value will be fundamental to future market segmentation in this arena.

Current views of user perceptions of the value of content delivered via ICTs

User satisfaction is seen as a key measure of the value of information technology (and content). Traditionally, this involves defining and satisfying needs (Bailey and Pearson 1983; Doll and Torkzadeh 1988; 1991), with a focus on utility (Choi et al. 2007; Lin and Bhattacharjee 2008; Wakefield and Whitten 2006; Wixom and Todd 2005). There is an assumption that the content provider has control over the user experience (as is the case with discrete systems such as an application on a desktop computer). In the ubiquitous technology era however, content provision involves an ensemble of participants including: device manufacturers, operating systems and middleware vendors, infrastructure and network operators, service providers, and other content providers (Tilson and Lyytinen 2006). For the purposes of this paper we consider all participants in this process broadly as 'content providers'. Some content providers in this complex service development and delivery environment, have limited (in most cases no) individual control over the user experience. Some of the problems of disintegration and discontinuity that arise in such a complex operation may be overcome by industry standardisation and regulation (Tilson and Lyytinen 2006). We argue that a new view of user expectations and behaviour will assist content providers (all participants) to provide a more satisfying experience for users.

At the user end, satisfaction of the ubiquitous computing experience will depend upon a range of factors, and utility may not be the only important one. We argue that, given the way users interact with ubiquitous content and technology – content malleability and user tolerance levels, rather than utility and user satisfaction levels, may become a more effective guide for the design of ubiquitous content (Choi et al. 2007; Davis 1989; Doll and Torkzadeh 1988; Lin and Bhattacharjee 2008; Venkatesh et al. 2003; Wakefield and Whitten 2006; Watson et al. 2002; Weiser 1993; Wixom and Todd 2005).

Current views of acceptance and diffusion of ICT

Individual acceptance and diffusion models that place technology at the centre of the equation in determining an individual's propensity for acceptance of innovation are offered as an explanation as to why a new idea, product, or practice will be adopted by members of a given culture or market segment (Davis 1989; Hargittai and Walejko 2008; Rogers 1995; Spennemann 2006; Venkatesh et al. 2003). In the ubiquitous computing era – where the technology is becoming invisible and users are demonstrating unexpected levels of resourcefulness, self-sufficiency and adaptability – past attitudes towards technology appear less relevant. Although recent literature has defined alternative approaches to analysis of user experience and impact on broad life satisfaction (beyond utility and functionality) in relation to ubiquitous technologies (Choi et al. 2007; Lin and Bhattacharjee 2008), we argue that the likelihood of wide acceptance and rapid diffusion of ubiquitous content will be enhanced by recognising the inherent similarities between groups of users based upon common experiences, predicaments and perceptions of value.

ILLUSTRATIVE SCENARIOS

The following scenarios are designed to illustrate the *limitations* of the traditional content/service provision approaches in terms of understanding the content requirements of the ubiquitous technology user. While these scenarios are not empirically based, they are reflective of the way many individuals engage with ubiquitous content and technologies today.

Ambient user requirements

In the ubiquitous computing era, content needs are increasingly dependent on particular user circumstances.

Scenario

Consider a commuter who is travelling by train to a particular destination. Further assume that she is carrying a smart mobile phone and is using this device as she travels. The type of content which may be relevant, and therefore regarded as valuable, is dependent on the time, destination and current physical location of the commuter. For example, as she is entering the station she may want to see information about all trains departing in the next 10 minutes; while she is waiting on a particular platform, she may want to know information about

the next train departing from that platform; when she is seated on the train, she may want progress reports, station alerts and leisure-type content; if her train is running late, she may want to “call home”.

From the perspective of the current utility focussed models of how users consider technology/content and how content providers conceive and structure their offerings, such a scenario could be difficult to model. Content (which frameworks such as Doll and Torkzadeh (1991) and Davis (1989) assume to be static) is becoming a ‘moving feast’. Certainly, this user has needs, although many and fleeting, and we might also say that the needs are predictable because they are associated with a distinct purpose (i.e. the user is travelling by train to a particular destination). However, given this user’s rapidly changing circumstances and personal preferences, how would a provider determine which content to *push* content to her? How, given the size of the screen on the mobile phone and the limited processing power, would this user *pull* content to herself? From a research perspective, how do we understand and measure user perceptions of content quality, when content itself is becoming an elusive concept?

It has been proposed that by taking the user’s context into account, a supplier of content and services may anticipate what will be relevant to that user (Scheepers et al. 2006). In the constantly changing context of the ubiquitous technology environment, the user’s context is seen to be made up of: situation, physical location, time, and even the history of prior usage of the technology (Kjeldskov 2002; Kjeldskov and Stage 2004; Paay and Kjeldskov 2004). Even knowing these things, in the end it is the individual user who perceives the value of the content. How does a content provider anticipate what the particular user will find valuable at any given moment?

Utility and other motives

In ubiquitous computing, other motives beyond utility and function determine user perceptions of the value of content. It becomes necessary to consider other (possibly vague) motives beyond utility/functionality alone when considering ubiquitous content provision.

Scenario

Consider the teenager who is visiting relatives in a remote, rural community. Further assume that he has a smart mobile phone and is using this device to keep in touch with friends and family at home. He logs into online social networks each morning and keeps the connection all day, to ‘be’ online, seemingly without any (utilitarian) purpose. He just does not want to miss out or feel isolated. He periodically checks to see what is going on. Sometimes he participates with a comment or contribution, but mostly he is just happy to be ‘connected’.

In this scenario the traditional content provision paradigm, which assumes a particular and often specific user need to be addressed, would either fail, or be difficult to put into practice. It does become important to consider other reasons for content (such as maintaining social relationships) which extend beyond utilitarian purposes.

Continuous context switching

In the ubiquitous computing era, the user of ubiquitous content frequently switches context (for example work, family, social relations), often subconsciously.

Scenario

Consider the surgeon who operates on patients at the public hospital, manages a professional consultancy, and holds an honorary position on the teaching staff at the local university. Assume that she is carrying a Blackberry handheld wireless mobile e-mail device. On a typical day, she is doing her rounds at the hospital. She receives calls and exchanges information with various medical specialists as she moves from ward to ward, treating her patients. At the same time, she fields emails and telephone calls from her professional practice and students. She also receives the occasional personal e-mail from her son.

This surgeon is operating across multiple roles: specialist, business person, teacher and parent. Her use of her ubiquitous device and the content on it would be difficult to categorise and segment using traditional marketing methods. Although the surgeon behaves in a similar way to many busy professional people living modern demanding lifestyles, traditional approaches to market segmentation do not aid in the identification of common requirements in terms of content.

Multitasking and blurred contextual boundaries

In the ubiquitous computing era, the user of ubiquitous content performs multiple, unrelated functions, simultaneously – known as multitasking – across contexts (work, family, other social relations).

This may involve performing multiple tasks in any particular stretch of time – for example doing some work while travelling, linking up with an old friend while busy doing another task, or reducing ‘micro boredom’, for example (playing a game on the smart phone while waiting for a train). Or it might involve performing a particular task in interrupted sessions – for example reading an online report while taking calls and visiting clients.

Scenario

Consider the parent who is called away from work to attend her primary school child who has been injured in a playground accident. Currently she is carrying a smart mobile phone (supplied by her employer) as well as a regular mobile phone (of her own). As she drives to the school she engages in phone calls to ensure that work continues while absent. The woman can access organisational systems (the enterprise portal and company intranet) via the smart phone, through an employer-provided virtual private network which offers secure remote access. She would pay for the connection costs of her ‘work phone’ from personal funds if needed, perceiving this not as a way of subsidising the organisation, but rather as a gain in personal flexibility (being able to work remotely on occasion, and to be available when her children need her).

The smart phone and ubiquitous connection to the office enable her to function irrespective of physical location, and she would pay for this connectivity if her employer did not. But as the bill for use of the smart phone is paid by the company, the woman does not feel ‘right’ about using it for personal purposes so she carries a second, private phone. While this may be a workable arrangement at present, such a scenario will become increasingly impractical – ubiquitous users would prefer to have one device with the possibility of separate digital identities. However, in this case, the woman has been unable to find a service provider who will allow separate accounts to the one device and her employer prohibits the storing of work information on private devices.

The traditional content/service provision paradigm assumes that users perform each task in isolation. In an era of ubiquitous device integration (one device capable of doing many things), richer approaches to content/service conceptualization are needed that reflects the user’s complete (personal, professional) “life world” (Harrington 2006).

Multiple identities

In the ubiquitous computing era, content requirements increasingly involve migration across multiple systems, services and domains.

Scenario

Consider a university student who is walking around the campus. Further assume he is required to log in and provide authentication to providers of different content (e.g. the library, different departments and the central university services, but also non-university services, including entertainment, social networks, etc.). Such a student would typically find this frustrating, having to deal with multiple service providers in a non-seamless manner.

The traditional content/service provision paradigm assumes that users access each particular system/domain/service in isolation and operate at all times under a single digital identity.

The above scenarios illustrate the limitations of the traditional content/service provision paradigm to allow for ambient user requirements, opportunity exploitation, continuous context switching, multitasking, or multiple identities, which are intrinsic to ubiquitous technology computing. This exposes the need for a more holistic, richer approach to conceptualising user behaviour and requirements in the ubiquitous computing era.

TOWARDS A RICHER CONCEPTUALIZATION OF UBIQUITOUS CONTENT

Continuous Quality of Life Optimization principle

The rationale for a more holistic conceptualization derives from the underlying premise that ubiquitous ICTs, which form part of the individual’s everyday life routine, need to be considered differently compared to ICTs that are associated with a particular application context, purpose, or physical location of use. When theorising about the value perceptions of ubiquitous technologies and content, we contend that broader constructs which encompass an individual’s “life world” become relevant.

Our central argument is that in their use of ubiquitous technology and content, users continuously seek to optimize their quality of life. This may involve doing things that augment their perceived quality of life, or reduce or eliminate incidents or outcomes that detract from their quality of life (such as being stuck in traffic, time-wasting, intrusions of privacy, etc.). Both the augmentation and the elimination of detractors constitute

ways that individuals *continuously* seek to optimize their overall quality of life. In articulating this optimization principle, we draw on established frameworks such as that of Allardt (1993) which sets out three key dimensions of an individual's overall quality of life: “*Having*”, “*Loving*”, and “*Being*” (summarised in Table 1). Continuously optimizing one’s overall quality of life includes all aspects of *Having, Loving, Being* (which in turn includes purpose-driven activities, leisure, social relations, etc.). Allardt’s framework provides useful parallels between ubiquitous content and overall quality of life measures. Of course, such quality of life measures will be dependent on each individual’s circumstances, predicaments and personal preferences etc.

Table 1: Example Quality of Life Indicator System (Allardt 1993)

	Definition	Example indicators
Having	Material conditions which are necessary for survival and for avoidance of misery	Economic resources, housing, employment, work conditions, health, education
Loving	The need to relate to other people and to form social identities	Attachments and contacts in the local community, family and kin, fellow members in association and organizations, workmates; active patterns of friendship
Being	The need for integration into society and to live in harmony with nature	Participation in decisions and activities influencing individual's life, political activities, opportunities for leisure-time activities (Doing), opportunities for a meaningful working life, opportunities to enjoy nature, either through contemplation or through activities such as walking, gardening, and fishing

Individual behaviour and expectations in the ubiquitous computing era

With this *Continuous Quality of Life Optimization* principle in mind, the behaviours and expectations of the people described in our earlier scenarios begin to make sense. In each scenario individuals can be seen to be using their mobile devices in ways that continuously optimize the overall quality of their lives. For example, the train commuter is enhancing her prospects of getting to her destination on time and in a pleasant way (*Being*). The teenager is enhancing his relationships with friends and family and reducing the loneliness and boredom of isolation (*Loving, Being*). The surgeon is optimizing her use of time and reducing her amount of travelling (*Having, Being*). The parent is enhancing her work/life flexibility in order to help her child, and reducing the impact this has on her work (*Having, Loving, Being*). The student is enhancing his daily studying and social activities (*Having, Loving*).

The proposed principle suggests that ubiquitous technology users *continuously* seek to optimize *each moment* of their waking hours by utilising the devices which they tend to carry with them most of the time. The process of deciding what may optimize the quality of life in any given moment involves the weighing up of options (what is available). A concept of ‘opting-in’ emerges. For example, the commuter may have a choice of watching a movie, playing a game, listening to music, or just sitting quietly and doing nothing. The choice to *use* the technology and to access the content will be based on such things as availability, urgency, convenience, cost, and other personal (highly specific) and sometimes irrational factors. For example, although it is dangerous to drive while juggling two devices, the parent may choose to do this because she sees her child’s wellbeing as more important than her own, at that moment. Cost may not be a significant consideration at the moment of use. For example, although the monthly bill is high, the teenager may see this as just ‘what it costs’ to ‘be’ online. It would also seem that the more unpleasant, unhealthy, or embarrassing the situation people find themselves in, the greater the urge to use available resources (such as ubiquitous technology) to restore quality of life. Hence, a concept of ‘predicament’ also begins to emerge in the ubiquitous computing era.

Individual value perceptions, needs analysis and market segmentation in the ubiquitous computing era

The scenarios demonstrate that individuals’ perception of the value of content is influenced by their particular circumstances and predicaments. Furthermore, we can assume given the limitations of the device and the ubiquity of the content, that users will manipulate content to meet their needs. This behaviour has been observed in the ubiquitous technology arena (Middleton and Scheepers 2008). And so, the ultimate value placed on ubiquitous content (by the user, not the supplier) will involve a summation of the content *and* the way it was manipulated to meet particular circumstances, rather than just how it was used (consumed). This would suggest that, in the case of ubiquitous content, we are moving away from theoretical notions such as ‘content usefulness’ and ‘user satisfaction’ towards the notions of ‘content malleability’ and ‘user tolerance levels’. In this respect, we also move away from the view of individuals as *users/consumers/receiver of content* towards a concept of them being *opportunistic/optimistic* participants in a new form of ongoing, instantaneous exchange in optimizing

their quality of life. With this in mind, the object for the ubiquitous content provider is to place opportunities for optimizing quality of life within the individual's grasp.

From a content provider perspective, each individual user could present a 'market', but dealing with such diversity is impractical and too costly from a commercial point-of-view. Add to this the exponential complexity of trying to anticipate multiple and quickly changing needs of the moment and there can be no doubt that *need anticipation* has become a challenging pursuit in the ubiquitous computing space. And yet, tailoring to the individual's need, in the moment, is precisely what is necessary if the individual is to find value in the content. According to our principle this *tailoring* is best left to the individual who is in the *optimum* position to judge his/her own needs. Assuming the content delivered will be manipulated by the user, to meet these needs, it follows that the content provided must be malleable within certain tolerance levels. With this in mind, providers would gain more from asking "what will help them optimize the moment?" rather than "what will they need?"

In terms of content provision (from a service provider perspective) this raises the need for segmentation of a large heterogeneous user population into more homogeneous user segments (Kotler and Armstrong 1996; Scheepers 2006). Presumably different user segments will have different indicators and values associated with their overall quality of life. Such indicators could include their life stage, income, background, education, health, etc. Some industry sources have examined segments of the mobile services market using some of these demographic indicators (Anderssen (2006) and more recently Choi (2007)) in relation to ubiquitous technology. However, we argue that the type of demographic indicators associated with what constitutes 'quality of life' in relationship to ubiquitous content will be different to such indicators for technology, a distinction that should be taken into account by researchers. In particular, studies are needed of ubiquitous content perceptions, that will account, for example, for why many teenagers perceive online social networking via a smart phone as enhancing their quality of life, and why the same activity is perceived as a waste of money by another demographic segment (their parents, say), given their quality of life perceptions.

In summary we propose that the *Continuous Quality of Life Optimization* principle offers content providers (and researchers studying the area of ubiquitous content provision) a richer construct to understand how users consider and value content. We contend that this principle and the notion of 'maximising the moment' encompass and subsume constructs offered by many of the other theoretical models such as usefulness and user satisfaction.

DISCUSSION

The *Continuous Quality of Life Optimization* principle suggests that ubiquitous content users *continuously* seek to optimize each moment of their waking hours, by utilising the devices which they have with them all the time. In line with this argument, we put forth a series of propositions to guide further research in this field. Given that 'quality of life' is a judgement of perceived value exercised by the individual, such perceptions will differ depending on individual circumstances. What one user may value positively another may perceive as boring or even negative. From a ubiquitous content perspective it becomes necessary to identify different user segments, in order to increase the probability that particular user segments will have predictably similar content requirements and tastes.

The propositions that follow should hence be understood as being specific to a particular user segment in terms of that segment's likely perception of what constitutes quality of life.

Proposition 1a: Ubiquitous technology users will associate a positive value to content which they perceive contributes to their overall quality of life. Allard's indicator system (Having, Loving, Being) is useful here in terms of considering the individuals overall quality of life perception.

Proposition 1b: Ubiquitous technology users will associate a positive value to content which they perceive reduces the negative impacts on their overall quality of life. For example, an individual would value a GPS-enabled navigation capability if this individual perceives such a technology to eliminate a detractor (such as being lost, frustrated, stuck in a traffic jam, etc.). As another example, a ubiquitous user would value content such as a program that could prevent unwanted, unsolicited calls.

Proposition 2a: Ubiquitous technology users will associate a negative value to content which they perceive reduces their overall quality of life. For example, an individual may resent content structures which obstruct or frustrate access to the content, or content that invades privacy, etc. This could also explain why some users will turn off ubiquitous devices in particular situations.

Proposition 2b. Ubiquitous technology users will associate a negative value to content which they perceive contributes to the overall quality of life, but which is offset by a significant detractor (such as being financially too costly or too cumbersome to access). This suggests that the user will consider the 'net effect' (gain versus

loss) of ubiquitous content decisions on their overall quality of life. For example, although a user may see value in content offered by particular provider, detractors such as the cost or the lock-in nature of the service contract may not be tolerated.

The *Continuous Quality of Life Optimization* principle has implications in terms of the research on technology acceptance overall. For example, user acceptance in traditional service provision models such as the technology acceptance model (TAM) (Davis 1989), and the Unified Theory for the Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003), hinges on key determinants such as perceived ease of use and usefulness. The proposed theory here suggests that utility alone does not adequately explain user acceptance in the case of ubiquitous content. For example, seemingly purposeless online social networking cannot be explained from the perspective of usefulness – instead this is better understood, from the perspective of the proposed principle, as adding to an individual's quality of life (*Having, Loving, Being*), in terms of that individual's social relations and the quality of life perception derived from that. This also calls into question distinctions made by earlier moderators such as age, gender, prior experience with technology, etc. Instead we propose that the quality of life perception calls upon a wider range of demographic attributes. Now we can explain why many senior citizens (conventionally viewed as late, reluctant or non-adopters) are quite capable of advanced technology use (e.g. GPS, online chat, smart phones) when these add to the quality of life – if one factors in family relations, grandchildren, etc. When one considers 'difficulty of use' (a detractor to usefulness in traditional narrowly defined terms) as a possible negative perception that the senior citizen may be overcoming to take advantage of the net gain in optimizing the quality of life (e.g. the *Loving* dimension), a weighing up of outcomes is evident here.

Finally, we contend that the proposed principle offers a different way for content providers to consider what might be *relevant*, by considering the simple question of how users will make the most of the moment in seeking to continuously optimize their overall quality of life. This principle may better explain why individuals would be prepared to spend considerable money just to 'be' online (without a specific purpose), do work while on holiday, play a game in a lecture, or socialise online with friends in the midst of a family gathering.

RESEARCH APPROACH

To investigate the principle proposed here, we plan to conduct a series of in-depth interviews with representative users in different demographic segments. Initially we will adopt traditional market segmentation methods as a point of departure. However we suspect that a different set of segmentation attributes might manifest as we explore *quality of life optimization* as opposed to traditional service provider/user demand methodologies. We envision that we could put forth a series of calibrated 'quality of life' measures, tailored for specific demographic segments which would better explain how ubiquitous users value content in terms of optimizing their overall quality of life. This in turn would be very valuable for content providers to understand how to shape and tailor their services for their users, and to work with other participants in the content delivery process to meet user expectations and requirements. This could also better explain seemingly contradictory behaviour, such as end users that pay for services out of their own pockets and yet use these for work purposes; or behaviour such as doing work while on holiday and not considering this as an intrusion into personal time but as adding to overall quality of life. Also, this could better explain why certain demographic segments (e.g. older, less experienced and female users – which models such as TAM and UTAUT would suggest have a very low technology acceptance) make use of ubiquitous devices. It is only when one considers use of such technologies from the perspective of their influence on overall quality of life that such behaviour starts to make more sense.

CONCLUSION

In this research-in-progress paper, we have proposed a richer conceptualization of how ubiquitous content providers could consider their users' content needs. This conceptualization is rooted in the principle that the ubiquitous user is continuously seeking to optimize his or her quality of life, maximising each waking moment.

In our future research we plan to test and refine the four propositions that we derived from the principle of continuous optimization of quality of life. We also plan to calibrate the different attributes (in terms of quality of life) that specific user segments assign to their overall quality of life perception. We propose to do this via interviews with different representative focus groups (e.g., teenagers, young professionals, older professionals, seniors) initially using the "take five" consumer segments proposed by Andersson et al. (2006). We envisage that such segmentation would need to be fine-tuned over time, given the differences we have identified between our conceptualization and traditional content/service provision constructs.

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