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The Emerging Requirement for Digital Addiction Labels

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Apologies

Message to REFSQ community

- ▶ Digital Addiction (hereafter DA), has become a serious issue that has a diversity of socio-economic side effects. In spite of its high importance, DA got little recognition or guidance as to how software development should take it into account.
- ▶ This is in stark contrast to other domains known for traditional addiction (e.g., **drugs, gambling, and alcohol**) in which there are clear rules and policies on how to manufacture, market and sell the products.
- ▶ We advocate the need to consider DA as a first class concept in developing software systems

DA and Depression



“ If a web addict is substituting meaningful friendships and socialising with virtual contact on the internet, this might have an adverse affect on their mental wellbeing ”

Sophie Corlett of the charity Mind

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'Internet addiction' linked to depression, says study

There is a strong link between heavy internet use and depression, UK psychologists have said.

The study, reported in the journal *Psychopathology*, found 1.2% of people surveyed were "internet addicts", and many of these were depressed.

The Leeds University team stressed they could not say one necessarily caused the other, and that most internet users did not suffer mental health problems.



Any direct causal link between internet use and depression remains unclear

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Twitter and Facebook 'addicts' suffer withdrawal symptoms

Facebook and Twitter users suffered withdrawal symptoms when forced to go cold turkey as part of a scientific study into the addictiveness of social media, academics have found.



Going cold turkey caused many of the participants to suffer withdrawal symptoms. Photo: CORBIS

<http://www.telegraph.co.uk/technology/social-media/9986950/Twitter-and-Facebook-addicts-suffer-withdrawal-symptoms.html>

- ▶ A Study at University of Winchester,
- ▶ Ten self-confessed Facebook “addicts” and ten prolific tweeters were asked to stop using their accounts for four weeks.
- ▶ Many quickly became isolated from friends and family and reported feeling “cut off from the world”.
- ▶ “So much of my life was organised via Facebook. I haven’t communicated with my family all week.”
- ▶ “I’ve felt alone and cut off from the world. My fingers seem to be programmed to seek out the Facebook app every time I pick up my phone.”

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S Korea child 'starves as parents raise virtual baby'

A South Korean couple who were addicted to the internet let their three-month-old baby starve to death while raising a virtual daughter online, police said.

The pair fed their own premature baby just once a day in between 12-hour stretches at an internet cafe, the official Yonhap news agency reported.

Police officer Chung Jin-won told Yonhap they "lost their will to live a normal life" after losing their jobs.

The parents allegedly spent hours following their internet obsession

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It could be more serious

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WORLD SOUTH KOREA

Gamer Dad Arrested After Toddler Dies of Neglect

Charlie Campbell @charliecamp6ell | April 15, 2014

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A father in South Korea is accused of allowing his young son to starve to death while he played online games, the latest tragedy that highlights the addictive nature of Internet gaming in the super-wired country

A South Korean man has been [arrested](#) on suspicion of allowing his 2-year-old son to starve to death while he spent days playing online games at Internet cafés.

Addiction types

- ▶ Kimberly S.Young classifies it to:
 - ▶ Computer addiction: computer game addiction
 - ▶ Information overload: web surfing addiction
 - ▶ Net compulsions: online gambling or online shopping
 - ▶ Cybersexual addiction: adult websites, Sexting
 - ▶ **Cyber-relationship addiction:** online relationships
 - ▶ Social Networks Addiction would be seen in this type

Young, K. "Internet addiction: Evaluation and treatment". Student Brit. Med.J. 1999, 7, 351-352

Symptoms

- ▶ SNS addiction incorporates the experience of the ‘classic’ addiction symptoms, namely
 - ▶ **Mood modification** (i.e., engagement in SNSs leads to a favourable change in emotional states)
 - ▶ **Salience** (i.e., behavioral, cognitive, and emotional preoccupation with the SNS usage)
 - ▶ **Tolerance** (i.e., ever increasing use of SNSs over time)
 - ▶ **Withdrawal symptoms** (i.e., experiencing unpleasant physical and emotional symptoms when SNS use is restricted or stopped)
 - ▶ **Conflict** (i.e., interpersonal and intrapsychic problems ensue because of SNS usage),
 - ▶ **Relapse** (i.e., addicts quickly revert back in their excessive SNS usage after an abstinence period)

Griffiths, M.D. A “components model of addiction within a biopsychosocial framework.” J. Subst. Use 2005, 10, 191-197.

Negative Consequences

- ▶ **Less involved with their real life communities**
 - ▶ Nyland, R.; Marvez, R.; Beck, J. MySpace: Social networking or social isolation? In Proceedings of the Midwinter Conference of the Association for Education in Journalism and Mass Communication, Midwinter Conference of the Association for Education in Journalism and Mass Communication, Reno, NV, USA, 23–24 February 2007.
- ▶ **Insecure in real-life, compensation in SNS**
 - ▶ Barker, V. Older adolescents' motivations for social network site use: The influence of gender, group identity, and collective self-esteem. *CyberPsychol. Behav.* 2009, 12, 209-213.
- ▶ **Negative feedback on SNS has negative effect particularly for people with low self-esteem who use SNSs to compensate that**
 - ▶ Ellison, N.B.; Steinfield, C.; Lampe, C. The benefits of Facebook "friends": Social capital and college students' use of online social network sites. *J. Comput-Mediat. Comm.* 2007, 12.
- ▶ **Facebook users had lower Grade Point Averages. Of the 26% of student feeling the impact on their lives, three-quarters (74%) claimed that it had a negative impact, namely procrastination, distraction, and poor time-management.**
 - ▶ Kirschner, P.A.; Karpinski, A.C. Facebook and academic performance. *Comput. Hum. Behav.* 2010, 26, 1237-1245.

Why is not it on Software?

- ▶ Tobacco Warning
 - ▶ <http://www.tobaccolabels.ca/>
- ▶ Uruguay: 80% of the front and 80% of the back
 - ▶ <http://www.tobaccolabels.ca/countries/Uruguay/>
- ▶ Uruguay Government Vs Philip Morris
 - ▶ the design of six messages that will fill the 80% space
 - ▶ a regulation that forces companies to sell only one variation of cigarettes per brand (to get around a previous prohibition on labelling cigarettes as 'light' or 'ultralight', some manufacturers had taken to colour-labelling cigarette packs)
 - ▶ http://www.tobaccotactics.org/index.php/Philip_Morris_vs_the_Government_of_Uruguay
 - ▶ <http://www.bbc.co.uk/news/world-latin-america-27647477>



Software can react

- ▶ Software is “more intelligent” than Alcohol
 - ▶ Alcohol can not tell you to stop, software can
- ▶ Software can be designed to react, but when and how?
- ▶ Besides banning/penalty (which might not be a bad option sometimes)
 - ▶ Constructive criticism
 - ▶ Incentives-centred design
 - ▶ Gamification
 - ▶ You attend social events and share photos and get points
 - ▶ Avatars
 - ▶ Socio-technical treatment or a “Blended” treatment
 - ▶ Peer pressure
 - ▶ Mutual Commitment

Interactive Labelling for DA

Requirements

- ▶ In general, DA represents a family of challenges:
- ▶ Ethical and professional requirements
- ▶ Behavioural change requirements
- ▶ New requirements challenges:
 - ▶ The need for care vs. the desire for freedom of use
 - ▶ Regulatory health requirements, probably soon?
 - ▶ Denial of needs
 - ▶ Addicts do not recognize/admit their addiction
 - ▶ Let aside providing how they would like to be treated
 - ▶ Stakeholders identification
 - ▶ The user, carer, public health institutes, peers, ..

Our Study

- ▶ Mixed methods approach
- ▶ To understand labelling requirements in 4 types:
 - ▶ Content and presentation
 - ▶ Ability to control, e.g. frequency, source, type, language, etc.
 - ▶ Awareness: I need to know why I am receiving labels
 - ▶ Adaptivity: intelligence in tailoring labels to my needs and preferences.
- ▶ First phase: Qualitative
 - ▶ Interviews with 11 participants, five male and six female, aged between 19 and 35 years old. Four professionals and seven students studying Computing (four) and Psychology (three)
- ▶ Second phase: Quantitative
 - ▶ To confirm and enhance the results of the first
 - ▶ 72 participants completed the survey (35 male, 36 female, and one preferred not to say). The age bands distribution was 18-25 (47%), 26-34 (33%), 35-44 (6%), 45-54 (4%), 55-64 (8%), 65+ (0%), and 2% preferred not to answer.

General findings

- ▶ The term Digital Addiction did not raise concerns
 - ▶ It is seen as a metaphoric term though
- ▶ 32% of the survey participants thought DA labelling is certainly needed, 50% thought is likely a good idea, 15% thought it is unlikely to be useful and 3% thought it is not going to work.
- ▶ Addiction is about:
 - ▶ Compulsive usage
 - ▶ Impulsive usage
 - ▶ Excessive usage
 - ▶ Hasty usage

General findings (2)

- ▶ DA is collective responsibility,
 - ▶ e.g. social pressure to be on Facebook, etc.
- ▶ DA labels are seen as ineffective when the original reason for DA, is more than a “careless” usage style
 - ▶ e.g. depression and tension could lead to gaming for hours
- ▶ Labelling in social settings
 - ▶ A label could compare one usage style to other peers
 - ▶ Generated by others, e.g. peer groups and health institutes

Message: Content & Presentation

▶ **Usage Related:**

- ▶ Time already spent on the software (86%)
- ▶ The number of times I checked/visited the software (56%)
- ▶ Usage "bill", like mobile bills and bank statements (47%)
- ▶ The features which I heavily used (e.g., Like, tagging, messaging etc.) (17%)

▶ **Consequence related:**

- ▶ Consequences on real social life (e.g., relations breakdown) (51%)
- ▶ Effects on physiological and mental health (e.g., eye strains, tension etc.) (50%)
- ▶ Damage on public profile (potentially seen by employers, etc.) (39%)
- ▶ The ease and speed of information spread once shared (32%)
- ▶ Potential risks on you, e.g. when you use social networks in excessive, hasty and unthoughtful way (29%)
- ▶ Consequences on your on-line relationship with others (e.g., hasty and not thoughtful interactions could be misinterpreted etc.) (29%)
- ▶ Consequences on online contacts (e.g., hasty and excessive tagging and sharing could affect the privacy of people involved in the posts) (19%)

Message: Content & Presentation

▶ **Advice related:**

- ▶ Suggestion/advice on potentially interesting real life activities based on your usage, e.g. going to a social event which matches your detected online interests (44%)
- ▶ Factual and proved statements about the benefits of regulating usage styles (38%)
- ▶ Suggestions/advice on how to regulate the usage style, e.g. using filters to reduce the amount of feeds/notifications (33%)

▶ **Presentation and delivery method**

- ▶ Time-based progress status (e.g., clock/timers for your usage amount) (61%)
- ▶ Dynamic colouring of interfaces to reflect your degree of usage (e.g., Green bar for reasonable use, Red bar for excessive use, etc.) (53%)
- ▶ Pop-up notifications (44%)
- ▶ Personalised metaphors (e.g., an avatar of you when being overly engaged) (31%)
- ▶ Hardware based interactions (e.g., vibration and flickering on mobile phones or 3D glasses of gamers) (26%)
- ▶ Sounds (e.g., beeping when you overly play a game or check Facebook) (21%)
- ▶ Offline notifications, e.g. sent as a message or email (19%)
- ▶ Analogy to traditional addiction (e.g., a metaphor of consumption of number of "digital" alcohol glasses) (18%)

Message: Content & Presentation

- ▶ **Supportive content (61%)**
 - ▶ when losing a game, a user would like a message moderating that feeling which will reduce the desire to start another round
- ▶ **Non-repetitive content (54%)**
 - ▶ Users would otherwise tend to ignore DA labelling
- ▶ **Not overly-negative content (51%)**
 - ▶ This is similar to the case where gambling is overly associated with people losing their properties and savings while it is still possible that people use it moderately as an entertainment tool
- ▶ **Socially-generated content (36%)**
 - ▶ It is similar to the case when one receives a friendly comment to stop drinking
- ▶ **Precautionary content (36%)**
 - ▶ Proactive to warn about the potential of becoming high-dependent on software

Control on the labels

- ▶ Although they may not necessarily do, people would like to be able to control:
 - ▶ The frequency of sending labels (60%),
 - ▶ How the label should be presented (graphics, sound, email, etc.) (50%),
 - ▶ The time(s) the label should be delivered (44%),
 - ▶ The actions that trigger a label (e.g., the things when used/done would require a generation and delivery of a label) (40%),
 - ▶ The type of information the label could contain (39%),
 - ▶ The accepted sources of the label (e.g., accept labels designed by certain developers, institutions or people) (38%),
 - ▶ The strategy through which the labelling is decided (proactive or reactive to my usage style, comparative/relative to others or absolute) (31%).

Awareness

- Generally, users would require knowledge how labels are generated
- The below statements elaborate on what affect their experience with Labelling in this regard:

Statement	SA	A	N	D	SD
Software needs to inspire my trust before I accept labelling.	31%	54%	13%	3%	0%
Labelling may lead to less natural use of software and make me lose closeness with it (no matter how useful labelling is).	4%	26%	44%	22%	3%
Software can only have approximation and estimation about my usage, so it should always make labels less confirmatory.	4%	50%	35%	8%	3%
I should be able to know how the label was generated and why; this will increase my acceptance of it.	25%	58%	8%	6%	3%
I need to be able know how my usage data and reactions to labels are used even if this is to enhance the labelling service.	14%	54%	22%	8%	1%
I feel software developers/industries are often unaware of, or uninterested in, the addictive nature of their software and its consequences	24%	46%	11%	11%	8%

Adaptivity

► Users require intelligent labelling adaptive to

Statement	SA	A	N	D	SD
The progress or stage of my addictive or excessive or hasty use (e.g., by changing the language and frequency accordingly)	25%	67%	7%	0%	1%
The type of devices I am using (e.g., my usage patterns and preferences on labelling may differ between mobile devices and computers)	24%	61%	8%	7%	0%
The time aspect (e.g., weekends and night time are probably peak time for using social software but it does not mean my usage would be excessive)	29%	49%	13%	8%	1%
My social context (e.g., in holidays or parties, one may post more on a social network)	15%	53%	18%	11%	3%
My personal profile (e.g., age, profession and sociability are all factors when judging whether it is an addictive use)	18%	40%	22%	17%	3%

RE additional challenges

- ▶ **Generally related to behaviour change**
 - ▶ Persuasion vs. coercion: the right balance
- ▶ **Regulatory requirements**
 - ▶ Labelling may be enforced by regulations
 - ▶ Labelling may be subject to compliance with regulations
- ▶ **Reconciling the users' paradoxical needs**
 - ▶ Control vs. Autonomy: intelligent labels but under my control!
 - ▶ Appreciation vs. Annoyance: advise me, but do not annoy me!
 - ▶ Being cared vs. Privacy: I like it, but they will monitor me!
 - ▶ Individual vs. collective: everyone is online, it is not about me!
- ▶ **Requirements Elicitation**
 - ▶ Addicts and their denial of needs, denial of reality
 - ▶ We may need to adopt “breaking through denial” techniques
 - ▶ Stakeholders, direct and indirect, e.g. family members

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<http://streetscene.org.uk/>



The participants in the study

The anonymous reviewers of REFSQ.





Thanks



We welcome collaboration
Come and visit us at Bournemouth

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