On Digital (Mobile) Humanism: helping understand it, engineer its future and ensure its social benefit

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ABSTRACT

The threefold motivation for the targeted interdisciplinary convergence that in November 2006 became known as Web Science is: to understand what the Web is, engineer its future and ensure its social benefit. This paper argues that the emergence and integration of data-intensive Web-based eScience and the smart mobile Web should be understood as leveling, extending and intensifying the playing field of a central emancipative thread called Humanism that can be traced throughout history. On the basis of contemporary Digital Humanism, the conversation society and collaboration economy are developing. Given the multi-faceted challenges we face today, a main focal point of Digital Humanism is the triple bottom line denoted by the trinity of people, planet and profit. From the current Decade of Smart on the combined sociological/societal, environmental/ecological and economic (welfare plus well-being) relevance and aim of Digital Humanism will be engineered carefully and rapidly through the alignment of eScience, a deluge of data from all kinds of sources and the smart mobile Web. We therefore introduce a sensible and simple reference model called ESSOFUNC to distinguish between essential, optional, fun and crap applications, as well as to help guide the configuration and tuning of necessary essential (core functionality), optional (functional bridges) and fun (social ergonomics) aspects for individual applications so as to literally "cut the crap." We apply our reference model to a cultural heritage navitainment app, which represents the rise of SMART (the Secure Mobile Application Repositories Trend) on TAFKAP (the Apparatus Formerly Known As Phone). The conclusion is that both smart and fun are key concepts to the successful serious development of Digital Humanism, certainly by means of sensible (mobile) applications. All instances of "smart" that pop up these days, as well as the notion itself, are signs of a new Age of Reason or Rationality coming up, featuring a new Scientific Revolution, a conversation society and a collaboration economy. Building a "smarter planet" this way is non-ideological and driven by necessity.

Keywords

2020, app, Age of Enlightenment, Age of Reason, eScience, Humanism, mobile, navitainment, people, planet, profit, Renaissance, science, Scientific Revolution, smart, smartphone, Web

1. INTRODUCTION

In explaining the role of the Web, we need to be careful since blatant techno optimism only breeds doubt and irritation. Obvious technological developments, dealing with all too human desires and inclinations, often can be envisioned decades, centuries or even millennia beforehand. Common sense tells us that physical movement or mobility, interaction in a broad sense and emotions are the three basic human needs for technologies to address. Every activity in modern life builds upon transportation, communication and satisfaction. The Web is about the virtualization and intensification of these three properties, literally e-mancipating the human race as an obvious evolutionary step, consisting of coding, programming and simulating, enhancing and extending human activity. Bringing the Web as close as possible to our senses via personal mobile devices and apps that are sensibly embedded in value chains, is an obvious way for digital technology to proceed thus enabling further progress in our conversation society [1] and collaboration economy [2].

From a historical perspective the times we live in show a clear parallel to the Renaissance and the Enlightenment of 1450-1800 in Europe, when communication, data generation and innovation took off thanks to the spectacular advance of technology, science and media. That is why at the start of *The Fourth Paradigm: Data-Intensive Scientific Discovery* [3]¹ a reference is made to the invention of the printing press around 1540 and the meticulous astronomical data gathering of Tycho Brahe (1546-1601) and the subsequent analysis of Johannes Kepler (1571-1630) in relation to our data-intensive digital world. Expectedly, in decades or less we will reap the fruit from modern data capture, curation and analysis [4]. From this comparison it is interesting to observe that today we can explore the heavenly bodies by means of smartphone apps².

Today's massive growth of data, literacy, education and democracy in scientific, societal and economic practice bears a striking resemblance to developments that shaped history from the mid 15th century on to the French encyclopedists Diderot, d'Alembert and others some three hundred years later. Two centuries thereafter, in the mid 20th century, modern computing, programming and digital networking began to take off, helping generate new bodies of knowledge, discoveries, inventions, innovations and insights in the nature of human activity. Given the speed and intensity of digital developments, we may safely assume to be on the brink of a contemporary mix of Renaissance, Age of Reason and Age of Enlightenment, holding the promise that these periods will not take place one after another over

¹ "The Fourth Paradigm" was published in honor of the late Jim Gray, a convinced eScience advocate. His four scientific paradigms are: empirical, theoretical, computational and data exploration or eScience, the latter being the phase where "IT meets scientists."

² Cf. Star Charting Apps for iPhone and iPod Touch. http://physics.weber.edu/schroeder/iPhoneStarApps

centuries but simultaneously in only a few decades. This highpotential convergence does not arrive a moment too soon, since for many years to come all hands will be needed on deck to help counter the massive challenges ahead. Our existence and that of other species are threatened, and so are the planet and its climate, plus our financial system and the economy³.

The wise use of data growth, digital manipulation and networking in scientific, economic and societal practice may well contribute to both solutions for our problems as well as to our commitment in trying to achieve them through a sensible boost in communication, coordination, collaboration and innovation. Although being understood in many different flavors, Humanism⁴ – in today's guise of Digital Humanism [5] or e-mancipation – may serve in this context as the common denominator that equally complies with the old and the new notions of Renaissance, Age of Scientific Revolution, Age of Reason, Age of Enlightenment and Encyclopedism, see Figure 1.

> RENAISSANCE >> 2.0 << ENLIGHTENMENT AGE OF REASON / RATIONALITY / SCIENTIFIC REV



Figure 1: A data deluge [6], eScience and the smart mobile Web are the cornerstones of tomorrow's smart solutions.

The emergence and integration of data-intensive Web-based eScience and the "smart mobile Web should be understood as leveling, extending and intensifying the playing field of a central emancipative thread called Humanism that can be traced throughout history. On the basis of contemporary *Digital Humanism*, the conversation society and collaboration economy are developing. Given the multi-faceted challenges we face today, a main focal point of Digital Humanism is TBL or 3BL, the triple bottom line denoted by the trinity of people, planet and profit (ppp). From the *Decade of Smart* [7] on, starting 2010, the combined sociological/societal, environmental/ecological and economic (welfare plus well-being) relevance and aim of Digital Humanism will be engineered carefully and rapidly through the alignment of eScience, (inter)organizational data and the smart mobile Web.

Bringing the Web, understood as the virtualization and intensification of human activity, as close as possible to our senses via personal mobile devices and apps that are sensibly embedded in value chains will help facilitate the "Decade of Smart" goals and the development of our conversation society [1] and collaboration economy [2]. After having presented the smart

³ Cf. "Welcome to the Decade of Smart." http://www.ibm.com/smarterplanet/decadeofsmart mobile Web in Section 3, we therefore introduce a sensible and simple model called *ESSOFUNC* in Section 4 to distinguish between essential, optional, fun and crap applications, as well as to help guide the configuration and tuning of necessary essential (core functionality), optional (functional bridges) and fun (social ergonomics) [8] aspects for individual applications so as to literally "cut the crap." The latter is demonstrated in Section 5 on our digital heritage navitainment app. To conclude with, Section 6 brings up discussion issues.

2. FOLLOWING THE THREAD OF HUMANISM

Taking as a starting point the Humanism and naturalism of pre-Socratic thinkers in ancient Greece like Protagoras (ca. 490-420 BC), who allegedly coined the phrase "man is the measure" and Democritus (ca. 460-370 BC), who is famous for his conception of "atoms" and known as "father of modern science," it is safe to conclude that a fact-based physicalism to accompany and contend sense-making metaphysics or metaphysicalism is a core characteristic of Humanism. Given our societal, ecological and economic amalgam of challenges and crises, the current phase of Digital Humanism may well be said to aim at a state of people, planet and profit through serious attempts to arrive at what IBM CEO Sam Palmisano envisions as "The Decade of Smart" [7].

At the very heart of the turbulent social, political, cultural, religious, scientific and philosophical developments during Renaissance on the one hand (roughly from 1300 to 1600), and on the other the Ages of Reason or Rationalism (early 17th century) and Enlightenment or Aufklärung (circa 1640-1800), the Scientific Revolution took place. This unique period of early modern scholarship ranged from 1543 to the start of the 18th century. 1543 was the year that Copernicus published his De revolutionibus orbium coelestium and Vesalius his De humani corporis fabrica. At the end of this period of scientific revolution Newton had published his Philosophiae Naturalis Principia Mathematica (1687). In 1708 Boerhaave presented his Institutiones medicae.

During the era of Scientific Revolution, scholars like Agricola, Boerhaave, Brahe, Descartes, Galilei, Kepler, Leeuwenhoek, Leibniz, Linnaeus, Newton, Pascal and Schickard turned towards physical phenomena and gradually abandoned the theocentric worldview as the exclusive set of principles to reconcile observations with. Still unchartered territories were, among others, the celestial, earthly and human worlds of astronomy, biology, chemistry, physics, anatomy and physiology. New instruments and the meticulous exploration of natural phenomena revealed hitherto unknown facts and led to new theories and models.

In those days, the physical focus of early modern science necessitated another metaphysical paradigm than theology in order to provide a reference model for empirical research. The mechanistic clock model, challenged by Einstein and quantum theory in the 20th century, became the predominant reference. In this way, technology supplemented theology and religion, and transformed their influence. The mechanistic worldview was convincingly embodied in the advanced planetarium machines of that time, like the Gottorp Globe [9], a spherical physical virtual world, completed in 1664, one could enter to experience and discuss the workings of His Heavenly Clockwork without being exposed to distracting weather conditions.

⁴ "Humanism is a worldview and a moral philosophy that considers humans to be of primary importance. [...] Its current philosophical meaning comes into focus when contrasted to the supernatural or to appeals to higher authority." [Source: http://en.wikipedia.org/wiki/Humanism]

Due to their successes in various disciplines and interdisciplinary convergence, and doubtlessly motivated by the 15th-century Age of Discovery and the ongoing geographical exploration, the pioneers of the Scientific Revolution were confident to be on the right track: empirically, experimentally and theoretically.

Apart from technological differences, the parallels with our times are striking. Only today we are beginning to fully explore the geography of the deep oceans and life forms within, while by studying outer space we are attempting to trace the universe back to its origins and hope to discover extraterrestrial life or even intelligence. Meanwhile, with machines like the Large Hadron Collider at CERN we expect to discover commonalities, laws and principles that offer hitherto unknown insights as a stepping stone for breakthrough developments.

Arguably, the most fundamental similarity with today is the role and development of technology, science and media, combined with a decisive shift towards Humanism and naturalism. During the Renaissance and the Age of Enlightenment, and most strikingly during the central period of Scientific Revolution, man so to speak took a down-to-earth stance, focusing more on people – for instance on the human body and on the way we experience things – as well as on the planet: how the Earth fits in the universe and the biodiversity around us. All workings and dependencies that were discovered from these people and planet viewpoints led to the appreciation of the then known micro and macro cosmos as a magnificent clockwork. Technology and science supplemented theology and religion as sole guiding principles. Politics, warfare, the economy, education and the development of social strata took their own course, as did art, literature, music and entertainment.

Over the past century, sociology, psychology, modern medicine and pharmacology have been pressing forth the human focus even more, while climate issues, energy issues, ecological issues, modern astronomy and geophysics have been doing the same for the naturalist focus, aided by core sciences like physics and mathematics. In between these complementary humanist and naturalist focal points nowadays lies a vast interdisciplinary realm of engagement, among others consisting of industrialization, globalization, politics, finance, the economy, healthcare and demographics, but also famine and food issues, water management, natural disaster in general, warfare and terror. The advance of computing and networking eventually led to a new organic metaphysical paradigm that can be described as "The New Biology of Machines, Social Systems, and the Economic World," being the subtitle of Kevin Kelly's 1994 book [10].

At this moment, four authoritative publications stand out that are clearly and complementary focused on people, planet and profit 2.0, being understood as an IT-intensive ppp focus: "Modeling and Simulation at the Exascale for Energy and the Environment" (U.S. National Laboratories at Argonne, Lawrence Berkeley and Oak Ridge, 2007) [11]; "SMART 2020: Eenabling the low carbon economy in the information age" (Climate Group, GeSI, McKinsey, 2008) [12]; "The Fourth Paradigm: Data-Intensive Scientific Discovery" (Microsoft Research, 2009) [3]; "Welcome to the Decade of Smart" (IBM, 2010) [7]. These publications focus on the following topics: algorithms, astrophysics, biology, buildings, climate, communication, infrastructure, Earth, energy, environment, finance, health, logistics, math, science, transportation and well-being.

IBM CEO Sam Palmisano's Welcome to the Decade of Smart'speech, held in London on January 12, 2010, is a historical pitch and commitment to the practical application of eScience. With respect to Humanism, Palmisano's argument of building a

smarter planet being realistic because it is so refreshingly nonideological is most interesting, since a common-sense and downto-earth approach [7] is characteristic of the ongoing shift from ancient Greek Humanism and naturalism via the people/planet focus that flourished in the Scientific Revolution period, bridging the Renaissance and the Age of Enlightenment, to a people/planet/profit focus in our times because of the multifaceted ppp challenges and crises we face that threaten prosperity and, according to some, even our existence.

Nowadays, ppp focused technology and science begins to supplement ideologies and politics. Palmisano sees proof of this: *"The planet is, indeed, becoming smarter ... Leaders are seizing the opportunity to drive meaningful change."* Furthermore, all four data-intensive/smart publications express confidence that exascale eScience and ppp relevant applications will thrive in the current ten years, starting 2010. Recently, such expectations reached mainstream journalism, since stakes and hopes are high. The Economist observed that businesses, governments and society are only starting to tap [the] vast potential of the data deluge [6].

All instances of smart that pop up these days, as well as the notion itself, are signs of a new Age of Reason or Rationality coming up, featuring a new Scientific Revolution, a conversation society and a collaboration economy. Building a smarter planet this way is non-ideological and driven by necessity.

3. TAFKAP AND SMART

Since the explosion of rich media in games and on the Web, the advent of serious gaming, the success of software gadgets and widgets and last but not least the rise of smartphones like the iPhone and comparable devices – now transforming into tablets, pads and slates – the play [13], fun [8] and game element is unprecedentedly taking hold of the lives of a growing number of people [14]. This intimate identification is a radical departure from Marshall McLuhan's Understanding (of) Media (as) The Extensions of Man [15] with a huge impact on behavior as well as on opportunities and challenges in our conversation society and collaboration economy, see Table 1 and Figure 1.

Year	Prediction
2008	416,000 smartphones sold worldwide (GfK)
2009	900,000 smartphones sold worldwide (GfK)
2010	smartphones for \$100, unsubsidized
2011	1 billion broadband mobile phones (ITU)
2011	"Sensorconomy"
2012	1 trillion networked devices: "Internet of Things"
2014	in emerging economies 70% will possess a mobile phone
2018	8 billion people worldwide, 5 billion people will possess a mobile phone, half of which will have Internet access

Table 1: Mobile penetration figures from GfK, ITU andMOCOM2020 [16]



Table 2: Ten near-future smartphone services in billion dollars [17]

The time seems near when everyone will need a smartphone-like device. This may even mean that in emerging economies most people will altogether skip the computer or One Laptop Per Child age.

With the upcoming slew of hybrid mobile devices, which undoubtedly will outsmart their phone ancestors, the new phone species may as well be dubbed The Apparatus Formerly Known As Phone (TAFKAP). On these TAFKAPs apps are running: "wildly creative, infinitely fascinating free or cheap programs that [...] turn your phone into a barcode reader, musical instrument, carpenter's level, video-editing station, game machine or just about anything else.⁵" These apps are available in stores, markets and repositories that pop up everywhere on the Web. In line with the smartphone notion we also call this trend "SMART: Secure Mobile Application Repositories Trend.

Personal mobile devices are changing the lives of a growing number of people. 2010 sees the ongoing development of next generation phones, pods, pads, tablets and slates. These devices and the apps living on them we use to express and experience ourselves, others and the environment. Chances are that TAFKAPs and their apps will have far more impact than just being our favorite toys. In this decade they may well develop into smart game changers for and integrators of lifestyle, business and society. Eventually man could even become a true Renaissance Man or Homo Universalis, TAPKAP being the gateway to a sensible mix of people, planet and profit applications.

4. THE ESSOFUNC REFERENCE MODEL

We have argued that the Web can be understood as the digital phase of Humanism, a central thread running through history. Having entered this digital phase, mankind for the first time has the means to engineer its future thanks to the emergence and integration of data-intensive eScience [3] and smart mobile Web. Bringing the Web as close as possible to our senses via personal mobile devices and apps that are sensibly embedded in value chains, is the obvious way for e-mancipation to proceed, thus enabling further progress in our conversation society [1] and collaboration economy [2]. The social benefit that is to be ensured translates to the non-ideological trinity of people, planet and profit. From this decade on, the combined sociological/societal, environmental/ecological and welfare/well-being relevance and aim of Digital Humanism will be engineered carefully and rapidly. We therefore introduce a sensible and simple model called *ESSOFUNC* to distinguish essential, optional, fun and crap applications in a broad sense, as well as to help guide the configuration and tuning of necessary essential (core functionality), optional (functional bridges) and fun (social ergonomics) [8] aspects for individual applications so as to literally "cut the crap."

Trying to be *smart* poses a challenge: it is adventurous, puzzling and competitive. Smart activities are a source of human and social satisfaction, generating a certain amount of *fun*: the integration of onerous work and serious play being a strong motivator. The central role of playing, gaming and fun within human culture has been aptly described by Huizinga [13], Podilchak and Lee et al. [8] among others. Earlier appreciation can for instance be dated back to Horace's (65-8 BC) prodesse et delectare with which he stated that poetry should be both useful and entertaining. Digital human culture now further fulfills these appreciations, combining fun and smart in sensible and simple lifestyle, business and societal applications that contribute to the goal of people, planet and profit convergence.





The ESSOFUNC model represents that only a relatively limited number of apps will be essential: fuel to drive your life. For instance, from regulatory or health perspectives several apps could be necessary, handy or desirable. Such serious apps that are smartly and securely embedded in value chains are still out today⁶ as are sensible business apps. Currently available apps at best are funky, groovy, urban and playful but still rather insignificant. Undoubtedly, the game-changing impact of TAFKAP/SMART

Just like technology and science supplemented theology and religion as the sole reference several centuries ago, today modern technology and science supplement ideologies and politics. They do so autonomously but the far stronger force is necessity, the "mother of invention" we inherited from Plato's Republic. Today, necessity springs from the multi-faceted ppp challenges and crises.

⁶ Cf. Open Mobile Apps Directory.

http://www.openmobileapp.com/home.html

⁵ David Pogue in the New York Times, 26 Nov 2009

will flourish on the crap side. Through all kinds of virtual seduction we likely will risk being tracked, hacked and manipulated even more. From the ESSONFUNC *model* we will apply three ESSOFUN *categories*. These three ESSOFUN categories are used to chart the configuration and tuning of necessary essential (core functionality), optional (functional bridges) and fun (social ergonomics) [8] aspects for individual applications so as to literally "cut the crap."

5. SIMPLE CASE STUDY: CULTURAL HERITAGE NAVITAINMENT APP

The advent of tourism in the 19th century saw the rise of a new profession, that of tourist guide, being "*a person who guides* visitors in the language of their choice and interprets the cultural and natural heritage of an area..."⁷. Those who cannot afford a guide or choose to explore on their own often use guide books from for instance the Lonely Planet or Rough Guides series. Before and during a journey, tourist-guideless tourists typically find satisfaction in composing his or her day program [18]. Next to information about hotels, restaurants and travel, guide books contain information about city life (culture, economy, environment, etc.), arts (literature, theater, music, cinema, etc.), architecture (e.g. building styles), history and walking tours [19,20]. When actually visiting a location, the active tourist has questions like: "what do I see?", "how did artists look at this place?", "what is its history?", "what kind of stories related stories are there?", "what events have been taken place here?", "what persons have been historically attached to this place?" and "what is my next stop?" et cetera.

Current smart phones belonging to the iPhone, Blackberry, HTC or Android families have continuous access to internet, know about their geographic location and even know what direction the user is looking at. These capabilities are being used for a number of applications that show the user a map of his/her current location with possible places of interest marked on the map (Linked Geo Data browser, Google Maps, Mobile DBpedia [21]) or they provide the user with detailed information about a particular aspect of the current location, such as interesting architectural structures to be seen.

These smartphone and internet technologies can provide answers by means of digital rich-media tourist guides. Current application functionality typically is limited to helping find locations of interest nearby and guide navigation, e.g. TomTom, Garmin and Navico, relying on proprietary maps or on public sources like Google Maps or Open Street Map. Background information about Points of Interest (POIs) is scarcely given.

5.1 Tourist "Navitainment"

We envision a mobile tourist-guide application able to dynamically combine navigation information provision and edutainment. Based on a geolocation and filtering criteria given by the tourist, the app can construct a walking tour. Typical cultural filtering criteria are: architecture, paintings (how are artists inspired by a geo location), photographs (capturing of historical moments), historical locations, et cetera. The idea is that the tourist starts with an initial criterion, e.g. paintings and can alter this during the tour. Our app uses nearby function of Wikipedia/DBPedia, Lineked GeoNames and Google Maps. Geolocations are being translated to physical locations such as buildings, squares, cities and airports. Also, these locations are mapped to nearby companies, governmental agencies and social activities, among others. Selected entities are used to query online news, social networks like Facebook and Twitter, and Linked Open Data sources like DBPedia. Through a smart summary function, experiences automatically can be passed on or stored for further processing.

5.2 APP Design

We already know a lot about the users: they are mobile, they want to be able to see useful content immediately without too much configuration and they need to be able to accomplish things with just a few taps [22]. A mobile device like an iPhone has limited bandwidth, computing and power capacity. Therefore we need to develop a light weight client for user interaction. The GUI of this device is limited: (7+/-2) items is about what a smartphone can display and be controlled by fingertip or stylus touching. The 7 Fingertip-Size Targets is similar to the Magical Seven defined by psychologist George Miller. He stated that human short-term memory has a span of approximately seven items plus or minus two [23].

End-user interaction is handled by a mobile device, in our case an iPhone 3GS (with GPS capabilities, a digital compass and assuming an internet subscription) combined with augmented reality⁸. This resulted in a three-tier architecture: user interaction, reasoning and LOD resources, see Figure 23.



Figure 2: Three-tier navitainment app arhitecture, including user interaction, reasoning and (access to) web resources.

5.3 **Prototype**

A tourist is standing on the Spui square in Amsterdam and opens his iPhone app. The application sends the geolocation $(s=\langle 52.2237, 4.5333 \rangle)$ and heading (h=60.23) to the spatial reasoning component of the web server which starts to retrieve information [26].

The next step is to use the heading of the user to determine what object the user's iPhone is directed at. This turns out to be the "Old Lutheran Church." Assuming that the user has selected the artwork/painting facet, the system will launch a search request ("spui+lutherse+kerk") to the semantic Web Data center [24],

⁷ Cf. CEN: European Committee for Standardization.

⁸ Augmented reality (AR) is a term for a live direct or indirect view of a physical real-world environment which elements are merged with (or augmented by) virtual computer-generated imagery, creating a mixed reality.

which returns a set of pointers to paintings relevant to the place. One of the paintings is selected and additional information about the painting is retrieved. The results are displayed on the screen of the iPhone, see Figure 3.



Figure 3: Augmented reality view on "Lutherse Kerk" (the Old Lutheran Church in Amsterdam) with selection: [artwork/painting], combined with annotation (in Dutch) and the facet-based selection [artwork/painting]. On the right GUI components are explained.

5.4 ESSOFUN Analysis

The mobile tourist-guide application is able to dynamically (optional: functional bridges) combine navigation (essential), information provision (essential) and edutainment (fun: social ergonomics).

The "cut the (app) crap" ESSOFUN focus for individual apps implies real-life contextual value-chain relevance. We deliberately chose a seemingly insignificant app with a navitainment essence, applied to cultural heritage. For a start navitainment already is a clear departure from navigation devices and apps. By adding more options (optional: functional bridges) to open and proprietary databases the essence of a merely navigational solution is being enriched. This leads to a broader use by more users in different user groups, which already is a non-technical fulfillment of the fun (social ergonomics) aspect. Competitive elements could be added, like exercises and high scores. Also, the app could be used in educational contexts at different levels. If applicable, the app could be used in a "cultural capital" context.

The app specific ESSOFUN architecture could be ported to completely different contexts, such as archeology, commerce, or Roku's Revenge [24] like city-adventure games, bearing a clear sports element. The app could be bridged through for instance Facebook Connect, as is the case in current state-of-the art mobile social gaming [25].

To enrich its essence, the app could be bridged to public transportation info, canal tour info, rental bike availability, car parking availability, traffic info, hotel room and bed &breakfast availability, programs of theaters, concert halls, university lectures, citizen discussions and so on, aiming to build a vibrant mobile virtual Amsterdam environment. The directly beneficial ppp effect would be: no more paper, social engagement, raising Amsterdam's image, commercial profit, mutualistic symbiosis.

Not only would these scenarios be beneficial to tourist and other stakeholders mentioned, also the value chain of developers, city government, police, users and databases would benefit, for instance through user-generated content, ratings and other measurement, that of course can be used for promotion and regulation via various channels. Although to some these features still will seem rather "crappy," their ESSOFUN relevance in many core and derived contexts is easily understood.

6. **DISCUSSION**

In this paper we presented the notion of Digital Humanism: the Web can be understood as both the virtualization and intensification of human activity, typically building upon human mobility, interaction and emotion. Given our multi-faceted challenges and crises, smart Web-related activities aim at a non-ideological people/planet/profit balance or at least will consider this necessary balance seriously, for instance regarding alphabetically: climate, democracy, demographics, economy (welfare and well-being), energy, finance, food, globalization, healthcare, industrialization, transportation (atoms), virtualization (bits), water et cetera.

This is the way we must understand the Web, engineer its future and ensure its social benefit, as is the threefold aim of Web Science. Expectedly, in the next decades, starting 2010, we will enter a new Age of Reason and Scientific Revolution from which we will be able to deliver on the promise of countering catastrophic damage to our complex human ecosystem as a stepping stone for reaching a higher level of mutualistic symbiosis.

We introduced a sensible and simple reference model: ESSOFUNC to distinguish essential, optional, fun and crap applications in a broad sense, as well as to help guide the configuration and tuning of necessary essential (core functionality), optional (functional bridges) and fun (social ergonomics) aspects for individual applications so as to literally "cut the crap.". We applied our reference model to a cultural heritage navitainment app, which represents the rise of SMART on TAFKA. The conclusion is that both *smart* and *fun* are key concepts to the successful serious development of Digital Humanism, certainly by means of sensible (mobile) applications.

Future research on digital humanism and the ESSOFUNC model will focus on the following issues:

- Does the angle of Digital Humanism help to understand and explain the Web and Web Science?
- How should the engineering of smart in the different senses be monitored?
- Is ensuring the social benefits of the Web or Digital Humanism synonymous with a ppp focus?
- How should the ppp focus in several contexts be monitored?
- How should a sensible and simple ESSOFUNC reference model and its categories be extended?
- Will the foremost challenge be not to live life in apps?

Further monitoring and research is needed to analyze and direct the alignment of eScience development on the on hand and the smart mobile Web on the other to ensure the beneficial ppp effects.

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