

The Information Commons and the Partner State Approach

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Abstract: While people enrich and expand the information Commons, building an alternative political economy within capitalism, this essay aims at contributing to the narrative of the transformation of modern capitalism into a consensual form of socio-economic life by introducing the Partner State Approach (PSA). The PSA, impregnated with peer production practices and ideology, is a cluster of policies and ideas whose fundamental mission is to enable and empower direct social value creation by user communities, and to focus on the protection of the Commons sphere as well as on the promotion of sustainable models of entrepreneurship and participatory politics. This essay argues that the PSA can constitute a pragmatic historical compromise between civil society – which directly produces use value – and the private sector – where the creative entrepreneurial spirit flourishes and creates several positive and negative externalities – and a step closer to the realisation of the Utopia of a society where the human being, in the Horkheimerian style, produces its own historical form of life.

The information Commons

The modern history of information Commons, i.e., socially created value that belongs within the public domain, begins with FOSS (Free/Open Source Software) in the mid-1980's. Later, forced by the rapid development of the Internet, it is Wikipedia, Peer-to-Peer (P2P) file-sharing systems and platforms driven by voluntary communities like LibriVox. The Social Web is emerging, unleashing torrents of information to the public domain under Commons licenses: From the blogosphere to alternative media hubs such as the controversial Indymedia or the Wikileaks, and from the Internet Archive platform to several openly accessible, peer-reviewed journals. A huge number of the aforementioned projects, such as FOSS or Wikipedia, are developed through the collaboration of dispersed communities of volunteers organised in Commons-based platforms, i.e., platforms that are not owned by a private entity geared towards profit maximisation, but owned by non-profit entities (take for example the Wikimedia Foundation or the Free Software Foundation).

The term "information Commons" conceptualises the deep affinities amongst all these forms of on-line collaboration and helps validate their distinctive social dynamics and generalise them as significant forces in economic and cultural production. (Bollier 2010) Commons-based platforms are considered as those "workplaces" of information production where users consciously participate in meaningful projects, producing use value for the public domain. The incentives are mainly non-monetary (Chakravarty, Haruvy and Wu 2007; Lakhani and Wolf 2005; Ghosh 2005), similar to those of the sharing/aggregation economies (i.e., reputation-building; the pleasure of communication; knowledge and experience gaining; fun, etc.) with one main difference: Volunteers share the crucial principles of a common vision and consciously participate in certain production processes. In addition, they normally belong to communities with stronger ties than those, if any, of the communities of proprietary platforms. (Bauwens 2007a) The processes of information production in Commons-based platforms have some certain characteristics which are embraced by the term peer production.

According to Benkler (2006), peer production is a more productive system for immaterial value than the market-based or the bureaucratic state system. It produces more social happiness as it is based on intrinsic positive motivation and synergetic co-operation. (Bauwens 2005a; Benkler 2006) Benkler (2006) makes, amongst others, two intriguing economic observations which challenge the mainstream understanding by the Standard Textbooks Economics (STE). Commons-based projects serve as examples where the STE's assumption that in the economic production the human being solely seeks profit maximisation is turned almost upside-down: Volunteers contribute to information production projects, gaining knowledge, experience, reputation and communicating with each other, i.e., motivated by intrinsic positive incentives. (references in Kostakis 2009; 2010; 2011b) This does not mean that the monetary motive is totally absent; however, it is relegated to being a peripheral concept only. (Kostakis, 2009) Many aspects of human expression, according to Benkler (2006, 461), "are replete with voluntarism and actions oriented primarily toward social-psychological motivations rather than market appropriation."

The second challenge comes against the conventional wisdom that, in Benkler's words (2006, 463), "we have only two basic free transactional forms - property-based markets and hierarchically organized firms." Commons-based peer production can be considered as the third, and it should not be treated as an exception but rather as a widespread phenomenon, which, however, for the moment, is not counted in the economic census. (Kostakis, 2011b) In STE terms, what is happening in Commons-based projects can be considered "only in the sense that individuals are free to contribute, or take what they need, following their individual inclinations, with a invisible hand bringing it all together, but without any monetary mechanism." (Bauwens 2005a) Hence, in contrast to markets, i.e., the holy grail of STE, in peer production the allocation of

resources is not done through a market pricing mechanism but hybrid modes of governance are exercised and what is generated is not profit, but use value, i.e. a Commons. (Bauwens 2005a; 2005b) In a nutshell, bottom-up innovation; collaboration; participation; sharing; community accountability; and intrinsic positive motivation, are key aspects of peer production. (Kostakis 2009; 2010; 2011a; 2011b) Moreover, it is facilitated by free, unconstrained and creative co-operation of communities, which lowers the legal restrictive barriers to such an exchange, inventing new institutionalised ways of sharing, such as the Creative Commons or the General Public Licenses. (Kostakis 2010) This new property forms allow for the social reproduction of peer projects, as they are viewed to be inherently more distributive than both state property and private exclusionary property. (Bauwens 2005a; 2005b; Lessig, 2004) So, in terms of property, the Commons is an idea radically different to the state one, where the state manages a certain resource on behalf of the people, and to the private property, where a private entity excludes the common use of it. (Kostakis 2009)

It can be argued that the information Commons economy includes new modes of production, property and governance that seem capable of contributing to the transformation of modern capitalism into a consensual form of socio-economic life. This Commons-based paradigm suggests ways of allocating resources without the guidance of either state planning or markets. The latter can be complementary to it towards a pluralistic, sustainable economy: Beyond ineffective anti-capitalist rhetoric to post-capitalist construction. (Bauwens 2007b)

The Partner State Approach as Agent for Economic Development

The information Commons, which can be now considered as a distinct sector of economic production and social experience, both complement and compete with markets, being an arena of social association, self-governance and collective provisioning. (Bollier 2009) “In a sense, the commons sector is a recapitulation of civil society, as described by Alexis de Tocqueville, but with different capacities.” (Bollier 2009, 295) It will be argued that the Commons-based modes of labour, production, property, and governance can permeate and impregnate states and markets, giving rise to the concept of Partner State.

The Partner State Approach (PSA) is a cluster of policies and ideas whose fundamental mission is to enable and empower direct social value creation by user communities, and to focus on the protection of the Commons sphere (both physical and information) as well as on the promotion of sustainable models of entrepreneurship and participatory politics. While people continue to enrich and expand the information Commons, building an alternative political economy within the capitalist one, by adopting a PSA the state becomes an arbiter, retreating from the binary state/privatisation dilemma to the triarchical choice of an optimal mix amongst government regulation, private market freedom, and autonomous civil society projects. (Bauwens 2010) Thus, the role of the state evolves from the post-World War II welfare state model, which could arguably be considered a historical compromise between the social movements for human emancipation and capitalist interests, to the Partner State one, which embraces win-win sustainable models for both civil society and market. So, we will try to systematise the recently developed concept of PSA around economic development.

Nowadays, it can be argued that the key players of global and local economies are governments, firms, and non-profit organisations, each with its own special, complementary or inconsistent interests and ecologies. In an extremely complex environment a PSA seeks to create synergies and maximise their positive results towards win-win, sustainable scenarios. The oldest peer production project is FOSS, around which already foundations, industries and business models

have been developed (Maxwell 2006; Ghosh 2006; Riehle 2007) creating a more complicated but mature (compared to other Commons-based projects) ecosystem. Based on that, it can be more safely argued why and how the aforementioned organisations, and thus society, can benefit from Commons-based practices and outcomes related to FOSS.

To begin with, cost saving is one of the main reasons for FOSS adoption concerning all the players. Moreover, through the adoption of open standards, on which FOSS is premised, governments can achieve interoperability so that bureaucratic mechanisms become more effective and efficient. In addition, the shift from proprietary software is boost for domestic software industries, either developed by non-profit organisations (such as universities or FOSS communities) or by open source businesses. In that way, national economies become more independent and promote economic development. Especially for small countries, like Greece, rich in brain-power but poor in industrial hands, the former constitutes a good chance for innovation and empowerment of the real economy. By supporting and producing open source technologies, firms do not only save money, but also have the chance to differentiate their services/products and build a positive reputation aligned with the open and collaborative culture. Thus, the adoption of FOSS is fundamental for a functional PSA.

In addition, the *FLOSS 2020 Roadmap* (Laisne et al. 2010, 10-13) addresses five points important for a PSA in relation to FOSS: Firstly, the safeguarding of network neutrality to ensure equitable treatment of decentralised Web services, “by prohibiting and sanctioning discrimination against protocols, applications, sources and contents”; secondly, the investment in the creation of “decentralized, user-controlled, free software-based Web services for all essential social/collaborative applications”; as well as the development of “new venues for research, public dialogue and publication that can bring together on-the-ground practitioners and theorists, and develop deeper cross-disciplinary understandings of commons-based governance and resource-management”; fourthly, the necessity for economic development policies that recognise and promote the growth of intellectual capital of society; and fifthly, the right for citizens to freely read, modify and share information that they, as a society, pay for.

The last two were the main objectives of the 2008 campaign, of which I was a core member, in Greece for the free release of the ERT archive. ERT is the national television and radio broadcaster of Greece, for the moment part of the public sector and sustained by a form of obligatory taxation. In late 2007, the initiation of a project regarding the digitisation of the old archives of ERT was announced (the project was completed a few months ago). Although this move had been considered as a significant first step towards the public availability of a unique cultural wealth, the decision to stream the material over a proprietary, commercial product incited Commons-oriented communities to protest. According to them, there is an “innocent fraud” behind this initiative: The digital archives remain the exclusive property of ERT. The story goes on as patented formats were selected to support the digitisation of the archive, which is actually a Commons that Greek people have been supporting both economically and creatively. In addition, supposing that ERT turns into a private company, then a Commons may fall into private hands. However, in an era where new regimes of Commons-based property have been developed, the aforementioned enclosure sounds problematic. The citizen has limited access to the archive. Although it is possible to see it, one is not allowed to use it freely, even for non-commercial purposes, without the written permission of the company. This constitutes a typical case that reveals the essence of state/public property. The property is exclusive and the state manages it, while citizens have no authority over it. In the name of the so-called public property, the object is detached from its natural subjects. Often, as numerous cases have shown in the recent past, the state/public property becomes prey to some specific dominated interests. The Commons-based property forms are against the private appropriation of the socially created value, trying to create

the widest possible usage while keeping the sovereignty with the individual. (Bauwens 2005a; 2005b) These new forms inaugurate the concept of peer property; very different from the private property which is exclusionary (following the token: “What is mine is not yours”), and from state property, which, although a collective property, is also exclusionary (“it is ours, but the sovereignty is regulated by a bureaucracy or representative democracy”). (Bauwens 2005a) The nature of the digital archive of ERT allows its reproduction and distribution with a marginal cost. The decision not to distribute the archive under Commons-oriented licenses imposes an artificial scarcity in a cultural wealth, which could be freely distributed to everybody and constitute a positive externality. Individuals would have the chance to use parts of the archive and creatively mix it, and redistribute it, under the same legal forms, to the Commons sphere.

Further, many peer production projects are now developing around organisations with a legal personality, i.e., non-profit foundations such as Apache Software Foundation, Mozilla Foundation, Perl Foundation, Wikimedia Foundation, Internet Archive or the Free BSD Foundation. Following O’ Mahony (2005), these foundations, in a nutshell, own the assets of the project (offices, hardware, etc.) and raise funds; offer protection to contributors from liability; decide project’s marketing strategy; play a significant role in the governance of the project and problem resolution processes; and facilitate horizontal communication amongst community associated projects. In addition to the cost saving and positive reputation aspects, firms can establish relationships with Commons-based foundations and even sometimes guide the project by making monetary, hardware or even software donations (open sourcing the code); hire individual contributors related to the project; or hold an advisory role influencing future developments of the project. (O’ Mahony 2005) Despite that these relationships can contribute to the sustainability of information Commons, the existence of Commons trusts/institutions is also important to guarantee the viability and independence (not isolation) of the socially created value in terms of monetary, promotion, distribution as well as legal support.

Using Bauwens’ thought (2009) as a point of departure, I try to outline the context of their operation by articulating some vital responsibilities and functions that such institutions should have:

- The diffusion of knowledge of the legal means for the creation and protection of information Commons, say, from lucrative exploitation.
- The creation of supportive collaborative infrastructures that would facilitate the development of Commons-based initiatives by those who face access problem, either because of scrappy knowledge or no access to ICT.
- The realisation of the importance of abundance through opening (non-confidential) public information and, thus, offering freely a significant means of production can have positive externalities and induce the creation of novel projects. (Kostakis 2011b) For instance, the digital archive of a public television broadcaster could serve as a great repository for further cultural creation. (Kostakis 2011b) Or the free distribution of public raw data, say, concerning burnt forests could lead to the creation of a digital record of possible reforestation regions, as the Tilaphos project has done Greece; which, however, was not supported by the state but citizens, using their GPS machines, recorded the burnt forests near them, and this created a large database of the burnt areas categorised per regional department. (Kostakis 2011b)
- The reform of educational systems adopting collaborative modes of production premised on the virtues of inclusion and autonomy.
- The establishment and maintenance of relationships and collaboration amongst all the key players of the economic field. For instance, the support of market value creation in co-operation with the Commons institutions, in compatible ways that do not deplete socially value creation. Open

source software firms or open textbook publishers are some examples that such an institution would support.

- The enforcement of open science, data sharing and open access initiatives, such as the Human Genome Project or dozens of Commons-oriented journals, to promote interdisciplinary scientific research by establishing a science Commons base.
- Experimentation on the expansion of Commons-based peer production to the physical world (see the Open Source Car Project or the Fab Lab Program). Like the design of FOSS source code or Wikipedia's articles conduction, social production design projects, emancipated from IP rents, could be considerably cost saving for material production and thus responsible for the production of cheaper material goods. Also, think of the Open Source Washing Machine Project where voluntary communities try to solve the global problem of washing clothes by exploring alternatives for washing machines for the developing world, based on different, innovative designs, methods and materials, each adapted to the special context of each place.
- The study and proposition of policies for the overall stimulation of social production. The energy, financial (micro-financing, as exemplified by Grameen Bank, or Peer to Peer lending, for instance Zopa, are interesting practices of social entrepreneurship) or manufacturing economy are fields for further research on alternative development paths.

Thus, the institutionalisation of the Commons sphere is an essential part of a PSA and can be considered as the main goal of a new, revitalised political struggle.

Conclusion

By no means does this presentation intend to formulate a specific economic plan or a clearly defined transitional policy to a Partner State. A fundamental belief, on which this presentation is premised, is the fact that there are no universal how-to manuals, because not only does every nation have its own special characteristics, but also rapid social change based on grandiose systemic substitutions, as history shows, usually has disastrous results; many times contradicting to what ambitious but benevolent revolutionaries may struggle for. Therefore, this presentation is an attempt to introduce suggestions and ideas for a post-industrial society and draw attention to the promising, creative rhetoric of PSA for Commons-oriented development.

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Sustainable heritage management ... for whom?

A critique on contemporary economics of culture & the use of Information and Communication Technologies towards a symbiotic management strategy

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The ongoing processes of economic appropriation of the surrounding resources have reached, in the last few decades, the somehow 'marginal' field of cultural heritage, seeking to re-invent its social importance and locate its place in the developmental national schemata beyond the singular touristic exploitation. In the 'sustainable development' environment, especially, a number of relevant patterns have been compiled in order to define heritage in monetary terms and transform it into an 'input'; thus, creating a number of inconsistencies, profoundly traced in the social and cultural compounds of cultural heritage. This paper critiques on these trends of culture economics seeking to establish a new pattern of dealing with heritage based on the use of Information and Communication Technologies.

Contemporary issues in economy and development

Being introduced in the aftermath of Enlightenment, modern development theories rise early in Europe, marking the gradual disassociation of economy from society, especially after World War II. The western economic paradigm, based on economic growth, extended to become the 'imagined' international norm through the introduction of GDP as the comparative scale of development, thus creating 'developed' and 'under-developed' countries in a context of western hegemony, crypto-colonialism, the threat of imminent bankruptcy to many European countries and anti-communism (Esteva 2009, 1-3).

These materially based patterns of development are organised around linear economic growth and converge with the neo-liberal views of free market, privatization, need for productivity and innovation, ability to buy and consume and other practices that define our lives nowadays, sustained by the important advents of technology.

Even though the above model resolved a number of social problems, it nurtured a number of deficiencies, widely recognized as the 'environmental problem' and the limited carrying capacity of earth to sustain these intensive human activities. Criticism and the need for alternative paths gave a twitch to the linear patterns of development by introducing the 'sustainable development' agenda, famously defined in the Brundtland Report as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, 43).

Political decisions that followed the UN World Summit in 2002 and 2005 marked the era of 'viable, fiable, vivable' development through a number of sustainable policies that operate under the mantra: 'Economic development cannot happen unless in a context of social stability and ecological balance'.

In order to operate, this -seemingly eco-logical- schema requires the translation of social, environmental and economic resources in a common pattern -i.e. economic value- to be inserted and balance the 'sustainable platform' of development. Even though not a critical factor economically wise, cultural heritage, already being exploited as a touristic product, has undergone a process of value re-interpretation in order to have its economic potential and contribution possibilities in this schema assessed.

Economic readings of cultural heritage

The first researches for the economic value of performing arts and culture appeared in the 1960's (for example, *The Liberal Hour* (1960) by J. Galbraith and *Performing Arts: The Economic Dilemma* (1966) by W. Baumol and W. Bowen). This attempt to capture, analyse and use the economic value of culture steadily enveloped cultural heritage and became a trend in the 1980's, in an effort to acknowledge its place in the developmental processes of the state and its cost-benefit pattern and to validate the state funding in relation to the public values/taxpayers' needs, altogether responding to the context of the 'New Public Management' (Throsby 2002, 101). The first systematic research for the important role of the management of cultural heritage in relation to the wider economic circle and the provided added value was by R. Lemaire (1980).

Parallel to that, the dialectics of 'cultural industry' appeared, declaring the importance of culture and cultural heritage to the national income, replacing other decadent industries (Walsh 1992) and promoting, at the same time, the national identity through the touristic product. Heritage industry is considered, nowadays, one of the most fast-pacing industries in world economy, valued for 7% of the world GDP and estimated to increase 1% per year (UNCTAD 2004).

From another point of view, this trend of economic analysis of cultural heritage converges with the calls for more representative, co-operative and democratic management. In the aftermath of the post-colonial era and emancipation processes, cultural heritage was explicitly acknowledged as a public good to be enjoyed and managed by the majority of its stakeholders, instead of specific communities of experts (archaeologists, architects, conservators etc.). The latter entered the multiple fields of self-reflection, altering their management processes in order to cater for the 'public' and promoting a number of alternative practices: e.g. public archaeology, community archaeology, archaeology and the media and others (Lekakis 2008)

As a respond to the ever-growing market and the capitalistic 'ways forward' adopted in the economy, nowadays, cultural economics have been developed as a stand alone field of study, researching mainly the monetary value of heritage through the binary value system of 'use' and 'non-use' values, prominent in the private sector as well.

Various econometric methods, mostly revolving around 'Contingent Valuation' and 'Willingness to Pay' methodologies, have been employed in order to assess, value and valorise heritage resources and become the desired input to strategic and developmental plans. Prominent example is the research conducted by 'Accenture' for National Trust's estates (Accenture 2006).

Cultural heritage is thus considered as a resource placed in the global market, after being transformed in the homogeneous aggregation of remnants (also known as 'Cultural Capital') that if managed appropriately and invested upon, could yield the desired, differentiated, 'special product'. As an input, parallel to the natural resources, cultural heritage could enhance the tripartite system of economy, society and environment, in the sustainable platform of development. This pattern consolidated in international charters and conventions (e.g. 2005 UNESCO Convention on cultural diversity, 2005 Council of Europe Framework Convention on the Value of Cultural Heritage for Society) appears nowadays through different forms of 'sustainable management for cultural heritage'; among them the second-use of preserved architectural heritage, especially in urban regeneration schemes and 'cultural tourism' patterns seem to be the undeniable leaders to the sustainable/economic appropriation of heritage in the contemporary economic environment and the only ways of viable protection of this fragile resource.

Problems of managing culture in an economic base

Even though these schemata seem to provide a palpable answer to the problem of heritage sustainability, especially in the contemporary environment of economic downshift, they also seem to generate a number of inconsistencies in the management of cultural heritage. Cultural heritage as a 'public good' creates a 'market failure', since it does not exclude people from enjoying it at the same time, or cannot easily contain 'free riding' (consuming the product without paying for it)(Mourato & Mazzanti 2002, 53). If, on the other hand, cultural heritage is addressed as a mere input to the wider developmental plans, it restrains its social qualities, being detached from the social context, and seizes catering for the wider public or the 'core' of culture. What is more, a number of threats appear ranging from commercialisation of interpretation to be fed in the touristic market and the creation of visitors instead of participants to the physical damage of the remnants because of increased use.

The role of ICT in the compilation of a new 'language' in managing cultural heritage sites

Even though, the economic importance of cultural resources could not be denied, we believe that an alternative 'language' for the management of cultural heritage that perceives culture holistically along with its social parameters, should be employed, without placing monetary cost-benefit patterns on the top of the agenda. Among the tools needed to compile this language, are Information and Communication Technologies (ICT) that could lead us from the contemporary to a more viable state. This potential is explored in the remaining of this paper and illustrated through the case of mobile applications for heritage sites.

As we examined, cultural heritage sites' sustainability being closely associated to the demands of heritage tourism strategies (Boniface and Fowler 1993) and affected by the rapid changes in global economy are confronted with the inherent problems of a market-based approach to cultural heritage, raising the demand for new directions aligned to the European digital agenda. The role of ICT -already successfully appropriated in heritage dissemination schemes- in the accessibility and the informed experience of the public, is becoming

increasingly apparent also in the formation of a participatory platform for managing and enjoying cultural heritage.

The uses of sophisticated new media provide audiences and visitors with more innovative and engaging interpretations of culturally significant sites or artefact collections in museums. Already, a plethora of experimental and commercial ICT applications have flourished in this field, a fact which is acknowledged by the ICOMOS Charters of London and Ename (Beacham et al. 2006, ICOMOS 2007) and illustrated by the European Commission reports and the research community (i.e. emergent themes in conferences such as Computing Applications in Archaeology (CAA) and VAST). Cultural Heritage constitutes an attractive, inspiring and profitable area for the industries of tourism and computing and from a heritage management point of view, ICT are recognised as suitable tools both for renewing content and hence, presenting new prospects in sustainable management of digital resources and enhanced modes of dissemination.

The stakeholders have shown a keen interest '*in integrated approaches to visitor management, in relation to the sustainability of the sites and the enhancement of the visitors' experience*' (Chrysanthi & Earl forthcoming). In the case of heritage sites, a significant number of collaborative projects are just starting to exploit the real potential of developing new methodologies to assist their research in interpretive archaeology (Monod & Klein 2005). Whether these technologies are used as interpretive or knowledge dissemination tools the main idea is to enhance the user's perception of the physical environment with additional cultural heritage content in a meaningful way. Usually, such information involves the visualisation of past anthropogenic environments, buildings and artefacts as well as textual and audio storytelling.

However, innovative ICT systems developed for on-site interpretation, as products of research funded by European schemes, are rarely employed by heritage institutions due to their experimental character and financial and technological unsustainability. In Greece's case, heritage sites have been used as a test bed for several innovative applications from audio guide tours and location based media to more advanced 3D interpretive technologies, such as mixed reality (e.g. the ARCHEOGUIDE project). In reality, the majority of heritage sites cannot sustain such technologies. The cost of employing these systems is recharged to the people who hesitate to pay additionally for digital content.

In an attempt to define a sustainable and cultural-social centric approach to heritage site management considering the input of ICTs, the focus is shifted to the European Commission's current digital agenda for mobile technologies. According to a recent study by the European Interactive Advertising Association (EIAA), over 71 million Europeans use their mobile phones to access the internet. Furthermore, the European Commission has proposed extending broadband access by 2013 and providing all of Europe's regions with access to speeds of at least 30Mbps by 2020.

Mobile handsets equipped with powerful media and combined with web 2.0 features prevail as the most promising medium for delivering cultural heritage content into our ever changing mobile lives, providing personalisation, interactivity and context-awareness. The 'Digital Agenda for Europe' includes

further digitisation of Europe's cultural heritage and low roaming tariffs a fact that will facilitate immensely cross-regional accessibility to heritage content via mobile phones. Parallel to this, an emerging democratisation process of mobile technologies spurs from the open source developing platforms, which are available to heritage specialist for creating interpretive applications. In essence, this means that rich media content can be delivered to the visitor through his personal device via a web-accessed or a standalone application available to download from the hosting institution (Kenteris et al. 2009).

The European Commission's strategy articulates the message that Information and Communication technologies should be treated as goods - accessible and affordable for the common wealth of societies- above and beyond the notion of 'profit'. This message accords with what in essence constitutes cultural heritage and justifies its existence as an academic and professional discourse; heritage management and development ought to be designed outside the laws of market but within the new frame, prospects and solutions that technological accomplishments provide the contemporary societies.

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Paper for the
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Title: Constructing notions of risk and safety in contemporary Greece: aspects of the introduction of biotechnology in the Greek network of blood banks

Abstract:

The recent introduction of molecular diagnostics in the Greek blood bank network represents the largest investment ever made in the Greek Public Health System. I concentrate on this case study in order to elaborate on the introduction of notions of risk and safety in contemporary Greece, and, also, in order to discuss issues of relevance to the introduction of biomedical technology in a country like Greece from a historical and sociological perspective. My focus is on understanding how risk and safety are interpreted and debated by different actors. For this purpose I perform research on the publications, reports and other work of doctors, medical professionals, and policy makers in Greece during the introduction of the new biomedical technology in blood screening. In addition, I discuss the public image of this biotechnology as it was portrayed in the Greek media (selected newspapers) during the same period.

During the 1990s in blood screening, the field of clinical microbiology and virology moved towards the incorporation of molecular technology. I focus on the introduction of a new technology of molecular biology the recent years which would complement (or replace) the techniques used previously in blood screening. The molecular diagnostics have been contested and debated internationally the previous decade and until they've begun being widely adopted. These debates deal with various arguments regarding the introduction of the new techniques in the different national settings. Therefore, I think it is important to examine the multiple facets of the introduction of this technology in Greece; as such an analysis would proliferate through a combination of primary sources. I concentrate on the construction of the various interpretations and negotiations of risk and safety as depicted in the aforementioned domains. The research is based on social studies of risk, enriched with approaches from the field of Science and Technology Studies, and History of Technology.

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Paper:

A) Introduction

In this paper I shall introduce to some points from my PhD research, which is informed by approaches from the fields known as STS (Science, Technology, Society) and HSS/HTS (History, Science, Society and History, Technology, Society). My work is focused on the concept of risk in connection to medical and biomedical technologies. More specifically, I focus on the issue of blood safety in transfusion medicine, as this is related to issues surrounding biomedicine, biomedical technology and biotechnology. The introduction of molecular diagnostics in blood donation is presented as one of the largest investment ever made in the Greek Public Health System, and I use it in order to elaborate from an HTS-HSS/STS perspective on the introduction of biomedical technology and biotechnology in a country like Greece. The introduction of the biomedical technology under consideration in the Greek Blood Donation System lasted more than 5 years. Its importance was debated in the public sphere when an incident of HIV infections through blood transfusions occurred in 2006. My research comes to the Greek case after having paid attention to the international debates over the introduction of molecular diagnostics in blood transfusion systems during the last 15 years (since the middle of the '90s). In this presentation I shall focus on certain aspects of the Greek case.

I am interested in examining how the notions of risk and safety are constructed. The risk-related literature has been growing in a fast pace over the last decade². Stemming from the social sciences many approaches to risk have been developed. The work of Jane Summerton and Boel Berner³ has been very influential to my work. The authors suggest focusing on the question of how technological risks and uncertainties are constructed, negotiated and handled by different actors. From the field of STS, Wiebe Bijker explicitly notes in a recent book chapter that “(...) the often-used distinction between objective risk and risk perception does not hold. Risks cannot be conceptualised as an objective, quantifiable, context-independent phenomenon; and in makes no sense either to talk of the perception of such objective risks”⁴. In addition, from the field of the history and social studies of medicine a lot of research has been developed regarding risk and uncertainty in medicine. Thomas Schlich suggests that “the concept of risk can be understood as a tool for dealing with uncertainty, but, like any other tool, it is a tool that already embodies a whole range of political and moral values”⁵ and at the end the decisions to be made regarding the acceptability of risks are political in nature.

Surrounding this discussion on the risk in blood transfusion is a parallel discussion on the public perception of risk, which *apparently* affects the implementation of Public Health policies in the western/developed world⁶. There has been some research in other countries about the public perception of risk regarding blood transfusion (psychometric studies, and other). My focus is not on this type of

² A review of the social approaches to risk cannot be presented here due to the lack of space.

³ Summerton, J. and Berner, B (2003). “Constructing risk and safety in technological practice: an introduction”, in Summerton, J. and Berner, B. (eds) *Constructing Risk and Safety in Technological Practice*. London: Routledge, 1-23.

⁴ Bijker, W.E. (2006). “The vulnerability of technological culture”, in H. Nowotny (ed.) *Cultures of technology and the quest of innovation*. New York: Berghahn Books, 52-69. p. 57.

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⁶ The issue of transfusion safety, and more specifically blood safety, is not uniformly worldwide and many contrasts exist among different parts of the world.

questions. This research is of great importance but these issues will not be addressed here⁷. I concentrate on the investigation of the way the notions of risk and safety are constructed by certain actors, in the different contexts.

My primary material in this research is twofold. Through discourse and textual analysis⁸ I approach the publications of health practitioners in Greece. In addition, I examine the media coverage of the topic. I am dealing with the public image(s)⁹ of the technologies implemented in blood screening, and the public discussion about risk in Greece, as this is portrayed in the Greek media¹⁰.

Concluding the introduction, I am presenting some results from my research on the international discussion on the case I am investigating in order to set the context. I have examined the debates and controversies regarding the introduction of molecular diagnostics (NAT – Nucleic Acid Techniques) since the middle of the 1990s. I have gathered and analysed international literature (from practitioners, professionals and scientists) on the topic that examines the introduction of the NAT techniques in different countries. I have attempted to follow their debate regarding the introduction of this new technology, and re-construct their argumentation on risk and blood safety.

From this research I have noticed that there have been considerable debates regarding the introduction of the molecular diagnostics in the blood screening in transfusion medicine¹¹. The main screening tests since the 1980's have been the serological tests¹². Since the detection of a virus with these tests supposes the

⁷ As far as I am aware there has been no recent direct empirical evidence concerning the perception of the risks of blood transfusion in Greece (apart from the EURO BAROMETER data). There have been published results from relevant researches in other countries, for example see Finucane, M.L., P. Slovic, and C.K. Mertz (2000). "Public Perception of the Risk of Blood Transfusion", *Transfusion* 40, 8, 1017- 1022; Barrett, R., R. G. Moore, and A. Staines (2007). "Blood Transfusion in Ireland: Perceptions of Risk, a Question of Trust", *Health, Risk & Society*, 9, 4, 375 – 388; Lee, D (2006). "Perception of Blood Transfusion Risk", *Transfusion Medicine Reviews*, 20, 2, 141-148; Hossenlopp, C (2001). "The Risk Debate in Blood Transfusion: How Perceptions, Beliefs and Behaviours Can Be Shaped by an Efficient Communication", *Transfusion Medicine*, 11, 2, 124-129.

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⁹ Mergoupi-Savaidou E., Papanelopoulou F. and S. Tzokas (2009). "The Public Image(s) of Science and Technology in the Greek Daily Press, 1908-1910", *Centaurus*, 51, 116-142.

¹⁰ Further research I plan to perform includes a series of interviews with practitioners in the Greek blood banks system. Furthermore, I consider that the analysis can proliferate through the examination of other relative groups which include patient groups (especially thalassemia patient groups) and blood donors associations.

¹¹ For some indicative literature see: Goodnough, L. T., Shander, A., & Brecher, M. E. (2003). "Transfusion medicine: looking to the future", *The Lancet*, 361(9352), 161-169; Bekker, L.-G., & Wood, R. (2006). "Blood Safety—At What Cost?", *JAMA: The Journal of the American Medical Association*, 295(5), 557-558.; AuBuchon, J. P., & Kruskal, M. S. (1997). "Transfusion safety: realigning efforts with risks. *Transfusion*", 37(11-12), 1211-1216; Alter, H. J., & Klein, H. G. (2008). "The hazards of blood transfusion in historical perspective", *Blood*, 112(7), 2617-2626; Busch, M. P., & Dodd, R. Y. (2000). "NAT and blood safety: what is the paradigm?", *Transfusion*, 40(10), 1157-1160; Kleinman, S. H., & Busch, M. P. (2000). "The risks of transfusion-transmitted infection: direct estimation and mathematical modeling", *Best Practice & Research Clinical Haematology*, 13(4), 631-649; Schreiber, G. B., Busch, M. P., Kleinman, S. H., & Korelitz, J. J. (1996). "The risk of transfusion-transmitted viral infections", *New England Journal of Medicine*, 334(26), 1685-1690; Calmann, M., & Diment, J. (2002). "Alternatives to nucleic acid testing in the blood transfusion service", *The Lancet*, 360(9344), 1518-1519; Roth, W. K., & Seifried, E. (2001). "Yield and future issues of nucleic acid testing", *Transfusion Clinique Et Biologique*, 8(3), 282-284; Laperche, S., Morel, P., Deschaseaux, M., Bouchardeau, F., Alimardani, G., Guillaume, N., . . . Lefrere, J. J. (2003). "HIV antibody screening remains indispensable for ensuring viral safety of blood components despite NAT implementation", *Transfusion*, 43(10), 1428-1432; Klein, H. G. (2000). "Will Blood Transfusion Ever Be Safe Enough?", *JAMA*, 284(2), 238-240.

¹² The enzyme immunoassay (or enzyme-linked immunosorbent assay ELISA) is a biochemical technique designed to detect the presence of an antibody or an antigen in a sample. These assays have been used as

seroconversion of it, the time period from the infection until the development of detectable antibodies or antigens, is called “window period”. During this period a virus cannot be detected, and the blood is characterized as false negative¹³. In blood screening, the field of clinical microbiology and virology moved towards the focus of molecular technology. The nucleic acid testing techniques (NAT) are gene-based and have been developed to screen blood for evidence of very recent and earlier viral infections (before the presence of antibodies or antigens)¹⁴.

The debates regarding the introduction of NAT in blood screening can be summarized in the following points:

- Poor cost-effectiveness: since the two techniques are complementary, the additional cost of introducing NAT is considered very high, and not comparable with other medical interventions.
- The resources could be committed to other interventions in transfusion medicine that are considered more cost-effective.
- The future developments in blood screening (pathogen and viral inactivation) could render the new test unnecessary and investment is questioned.

While I analysed the literature I noticed that notions of risk and safety are associated with different factors. At one hand we can discern a notion of objective risk that is connected to quantifiable measurements through mathematical and statistical modelling. Following this approach, we can consider the new available technology as superior regardless of other social and economic parameters. At the other hand, some clusters of researchers question the technology-driven decisions, as they consider the issue of risk in the wider context of transfusion medicine. I have attempted to show that the risk is not inherent in the techniques and irrespective to the variables considered.

B) In Greece

The introduction of NAT in Greece

The introduction of NAT in the Greek Blood Donation services did not happen uniformly in all the blood donation centres. Greece has not been a country that produces such technologies, nor being one of the first to implement it. Additionally, during the various stages of the implementation of the new screening technology, it received extensive media coverage.

The discussion about the introduction of NAT in the Greek blood transfusion services began, like in other European countries, at the beginning of 2000. However, the introduction of the NAT screening tests was not official instituted. At 2003, when it was still optional, NAT was implemented in a small number of hospitals which hosted blood bank centres. In 2005 the Presidential Decree 138/2005 involved the harmonisation of the Greek legislation with the provisions of the Directives 2002/98

diagnostic tools and are used to evaluate the presence of an antibody or antigen in a blood sample (in serum concentrations). Since the first ELISA tests, the relevant techniques reached a third generation of development and are offering higher sensitivity and specificity than before.

¹³ These false negative samples constitute the residual risk of transfusion transmitted infections in blood transfusion (the probability that a potentially infectious donation will be released into the blood supply).

¹⁴ NAT detects a virus’s genetic material and for that reason offers the potential of reducing the window period. The techniques that have been commercially developed in USA and Europe are the amplifying techniques of PCR (polymerase chain reaction) and TMA (transcription mediated amplification). NAT techniques can be applied in single samples, and in minipools (SD and MP NAT).

EC and 2004/33 EC of the European Parliament. The same year a new law was voted in the Greek Parliament (3402/2005) for the reorganisation of the blood donation system, changing the regulatory framework through the creation of the National Centre of Blood Donation, which would be responsible for all the nationwide Blood Centres and Hospital based Blood Donation Services.

The initial plan of the nationwide implementation of the molecular diagnostic technology for the blood screening in Greece was planned through the creation of 14 blood centres. In the beginning of 2006, 8 centres had implemented the NAT screening techniques, whereas for the remaining 6 the Ministry of Health was planning the implementation during the same period. In March 2006 the media covered a story about an HIV transfusion transmitted infection in Greece. The infected blood was released from a centre that did not perform NAT screening. The event was a headline for many days and a public debate was evoked with repercussions on the public health policy procedures. Despite the promises for the acceleration of the NAT implementation in all the centres, this did not happen until 2008. Additionally, a new plan for the National Blood Donation scheme was presented, with the creation of 9 Blood Centres in which the blood from all the local blood banks would be tested¹⁵. In August 2008 the Ministry of Health made an official announcement on signing a convention on the procurement of the NAT equipment for all the centres. Notably, the procurement procedures were also debated a lot in the Greek media and from the health practitioners because of the delays that were caused in the NAT implementation since the end of 2005. In Greece both commercial systems were implemented (PCR by Roche, and TMA by Gen-Probe).

The view of health practitioners in Greece:

The sources that I have examined in order to approach the arguments of the health practitioners in Greece are the following:

- Journal *HAEMA* (AIMA), *The Journal of the Hellenic Society of Haematology*
- Newsletter of the Hellenic Society of Clinical Chemistry and Clinical Biochemistry
- Bimonthly journal of the Greek Society of Microbiology
- The medical journal *Epitheorisi Ygeias*, a bimonthly interdisciplinary medical periodical¹⁶.

In these sources the results of my research were poor. Several articles were identified regarding various issues surrounding transfusion medicine. Only a few articles were dealing with the molecular diagnostics and the specific factors of the implementation of the new technique in Greece.

As I examined the journal *HAEMA* I noticed the lack of articles or reviews regarding the transition in haematology to molecular diagnostics in blood screening. The most relevant article identified is a review article titled “Transfusion-transmitted infections: epidemiology, risks and prevention”¹⁷, in 2001. The introduction of NAT testing for the reduction of residual risks in blood transfusion was discussed with no particular reference to the context of its adoption in Greece. I spotted one more review article which discusses the transfusion risks and the authors suggest that more

¹⁵ One is the National Centre of Blood Donation, and the other 8 are based on Hospital Blood Centres.

¹⁶ It is published by MediForce Services S.A. and it is available through subscription. It is addressed to health managers, doctors, pharmacists, engineers, qualified nurses, health technicians and laboratory staff, students of health science and health professions, and others.

¹⁷ Theodossiades G. and M.Makris (2001). “Transfusion-transmitted infections: epidemiology, risks and prevention”, *Heama*, 4, 1, 24-38.

attention needs to be paid toward addressing the issue of transfusion safety, than solely dealing with blood safety¹⁸. I have identified this argument also in the international discussion.

In 2002 the Hellenic Society of Haematology held a daily educational conference on the topic ‘Molecular biology in blood donation’¹⁹. On the contents we distinguish seven papers regarding the molecular diagnostic techniques on blood screening. Five of these articles present the ‘state of the art’ in molecular diagnostics with respect to HIV, HBV, HCV, other viruses, and other infectious agents²⁰. It is interesting to notice that there is no discussion about possible implementation of the techniques in Greece, especially in connection to local characteristics. The other two articles come from two haematologists (both are Directors of Blood donation Centres in Athenian Hospitals). L. Dadiotis is asking in the title ‘*Serological screening with the supplement of NAT. Is that the message of Haemovigilance?*’²¹ and he is discussing the estimation of the risks in a specific national, social and economic context, the protection measures that can be implemented, and the cost-effectiveness aspects, with respect to the pursuit of safe blood. Therefore, he is raising the importance of alternative approaches to transfusion safety in contrast to the technology driven shift towards the molecular diagnostics. He is also concluding with the significant role of the media in the presentation of blood donation cases. This argumentation has been encountered in the international debate. On other article M. Mosxou-Parara²² is discussing the various strategies toward the reduction of transfusion errors. In connection to the scientific and technological developments in transfusion medicine, she is reminding that there is still room for improvement in transfusion medicine by focusing to the everyday practices, meaning alternatives to the marginal advances in blood screening.

In the published proceedings of an educational seminar of the Hellenic Society of Clinical Chemistry and Clinical Biochemistry I have examined an article by N.Diakoumi-Spyropoulou²³. The author examines the molecular diagnostics (review of the technique) and discusses the possible introduction in Greece. She is addressing the issue of risk in connection to the multiple variables surrounding blood screening (for example cost-effectiveness, alternative solutions, and the issue of worldwide inequalities in blood safety).

In the journal of the Greek Society of Microbiology a research article was published in 2008 dealing with the results from the implementation of NAT. I have spotted also other research articles on the results and the yield of NAT screening in Greece (from various blood centres) published in medical journals, and medical conference proceedings.

Media coverage:

¹⁸ Gafou A., Georgopoulos G., Bellia M., Vgotza N., Maragos K., Lagiandreou T. and E. Digenopoulou-Andrioti (2005). “Review in the literature of the new solutions to an old problem: human error in transfusion practice”, *Heama*, 8, 4, 598-611.

¹⁹ Hellenic Society of Haematology (2002). Proceedings of educational conference “Molecular biology in blood donation” 13/12/2002. [In Greek].

²⁰ The authors are two biologists, one biochemist, one clinical pathologist and one haematologist, all working in blood donation centres in Greece.

²¹ Ibid. p.81.

²² Ibid. p.105

²³ Diakoumi-Spyropoulou N. (2005). Molecular Biology Techniques Τεχνικές in the screening of blood transfusion. Educational conference EEKX-KB (17/12/2005), κείμενα διαλέξεων, 142-156. [In Greek].

In order to examine the media coverage I have searched five newspapers. The selected newspapers are *Ta Nea* [Τα Νέα] and *To Bima* [Το Βήμα] (both belong to the Lambrakis Press S.A.), *Kathimerini* [Καθημερινή], and *Rizospastis* [Ριζοσπάστης]²⁴. The newspapers were chosen by the following criteria: a) their daily circulation, and b) covering the political spectrum.

Some important aspects from the research are the following. The first articles that I encounter regarding the use of molecular diagnostics in the blood bank setting are at the beginning of the year 1999. The possibility of the early adoption of these techniques in Greece is discussed. This discussion happens in connection to the reporting of a case of transfusion transmitted infection of HIV which occurred in 1998 and came into public in January 1999²⁵. This incident was discussed also during 2000. In these articles the techniques used in the blood donation systems are discussed in connection to blood safety and the residual risks.

The following years I have spotted some relevant articles dealing with various issues regarding transfusion medicine. In 2006 the issue of blood safety received media coverage when the newspaper *To Bima* (in 28/03/2006)²⁶ published a front-page headline regarding an incident of transfusion transmitted infection of HIV to two patients (a 16 year old thalassaemic, multi-transfused girl, and another older patient)²⁷. The incident occurred from the blood donation of the same donor (in window period donation) in the Ippokrateio hospital of Salonika²⁸. The immediate period after the public disclosure of this incident I encounter many relevant articles, as the incident evoked a political and social discussion. Briefly here, I would like to refer to way the two techniques were presented. The first days I have noticed that the new technology (NAT) was presented as inherently superior to the previously used techniques, regardless the multifaceted dimensions of its implementation. In addition, the new technique was considered more advanced in the context of the ideology of the superiority of the biotechnologies and biomedical technologies in general. Risk and safety are used as opposites and the articles also discuss the possibility of ‘zero-risk’ in transfusion medicine and the opinion of experts. Some days later I come across articles that discuss the issue of blood safety in the context of transfusion safety. In these articles health professionals were interviewed and more positions were presented.

The following period the newspapers have frequent reports regarding the implementation of NAT all over the country. Another incident of HIV transfusion transmitted infection occurred in May 2005 in an 85-year old patient²⁹. In this case

²⁴ I have searched these newspapers for the period 1996-2010, by using combinations of keywords. The results were examined and the relevant articles are: *Ta Nea* 45; *To Bima* 30; *Kathimerini* 40; *Rizospastis*, 81.

²⁵ (1999, 18 January). Νέα Μέθοδος διάγνωσης του AIDS. Θα εντοπίζουν άμεσα τον ιό (New method to screen AIDS. The virus will be detected immediately). *Ta Nea*, 38; (1999, 5 October). Εξέταση που ανιχνεύει το aids στις αιμοληψίες δεν γίνεται λόγω υψηλού κόστους. (Aids screening test is not performed due to high cost). *Ta Nea*; (2000, 12, August). Ερωτήματα για την ασφάλεια και τον έλεγχο του αίματος (Questions about safety and blood screening in transfusions). Μ.Πετροπούλου, *To Βήμα*, 14; (2000, 14 September). Μόλυνση βρέφους με έιτζ. Εξαιρετικά σπάνια περίπτωση (Baby infected with AIDS, very rare incident). *Ριζοσπάστης*, 28;

²⁶ (2006, 28, March). Μετάγγιση θανάτου σε δεκαεξάχρονο κορίτσι! (Death transfusion to 16-year old girl!), *To Βήμα*, 01.

²⁷ (2006, 28, March). Μετάγγισαν AIDS σε δεκαεξάχρονη! (AIDS transfusion-infection to 16-year old girl!). Ι.Σουφλερή, *To Βήμα*, 03-04; (2006, 29, March). Μόλυνση από τον ιό του EITZ «Σιωπηλό παράθυρο» σε κραυγαλέες ελλείψεις (HIV infection, ‘silent window’ in great deficiencies). *Ριζοσπάστης*, 10; (2006, 29, March). Δράμα που αφύπνισε Πολιτεία και όλους μας, Μόλυνση από έιτζ 16χρονης και 76χρονου ύστερα από μετάγγιση (Drama that waken the State and everybody). Π.Μπουλουτζα, *Καθημερινή*.

²⁸ SKAE (Hellenic Coordinating Haemovigilance Centre). *Summary Report*. Athens, 2008. SKAE report has data on the infections per donations tested.

²⁹ (2006, 11, May). «Άνοιξαν παράθυρο» στο AIDS! Νέο κρούσμα μετάγγισης με μολυσμένο αίμα για λόγους οικονομίας (They opened window to AIDS!). Δ. Κουκλάκη, *Ta Nea*, 14; (2006, 11, May). Διαπίστωση μόλυνσης

the blood sample was tested with NAT (in minipools), but was released in the blood supply. In the media coverage of this incident we can see discussions about the techniques in detail.

Concluding remarks

By examining the publications of health practitioners in Greece and the media coverage with regards to the introduction of the molecular diagnostics in blood screening I am attempting to view how the notions of risk and safety are constructed and debated. I am focusing on the concept of risk as it is connected to the specific medical technologies. As far as the positions of the health practitioners are concerned more research needs to be done since the results have been poor until now. Regarding the media, I have identified a vast number of articles as the media coverage of the transition in blood screening has been extensive. The crucial event seems to be the 2006 case of the HIV transfusion transmitted infection.

In this attempt we can see opposing views. One somehow more technocratic, following the model of adopting technology based solutions that are connected to objective risk measurements. At the other hand, we came across approaches that concentrate also to the context and the variables surrounding the implementation of the new technology.

από παλιά μετάγγιση. Ο ιός ξέφυγε και απ' το μοριακό έλεγχο ((HIV infection from old transfusion, the virus was not detected by NAT). Ριζοσπάστης, 21.