Old Buildings, New Ideas

A note on the Emerging Creative Industries in Maastricht

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Contents

8

Patrick Geddes and Play of Urbanism

Exploring the scope of Urban Informatics for Creative Industries in Maastricht

Ranjit Singh

> "The mere formulation of a problem is far more often essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle require creative imagination and marks real advances in science"
>
> - Albert Einstein (Klein, 2004, p. 31)

This quote can be understood as the basic building block, the essential aspect of any creative industry. Every creative industry works under the paradigm of problem-solving irrespective of the domain in which they operate, the methods they employ or products they develop, where solutions are transitory and keep evolving with the problems being solved. In this sense, an essential quality of creativity is the ability to formulate a problem to the extent that the solution becomes an inevitable possibility in the future – something to work towards, something that resides in the very definition of the problem itself.

This paper is an approach to problem-solving. Problem-solving as a method could imply a logical approach that breaks down a single question in a set of questions and then, handles each of these secondary questions individually to approach the primary question in a comprehensive way. If one can solve each of these secondary questions, the primary question just becomes a problem in integration, a whole, which inevitably seems to be greater than the sum of its parts.

The primary question that would require an answer in the context of this research paper is – How does one capture the evolving narrative of the development of Maastricht in a way that is *inclusive* and *ubiquitous* across its geography?

The rest of this paper is structured on the premise of the question and the secondary questions it generates. The first section deals with the question: Why would one want to capture this evolving narrative? The second sections deals with what informa-

tion has to be captured to showcase this evolving narrative. The third section would explore where would the solution be located or in other words, who is the target audience for this evolving narrative of development. It would comment on the possibilities of the words *inclusive* and *ubiquitous* in the context of the question. The fourth section would be about how this evolving narrative can be captured by looking into the paradigm of Urban Informatics (Foth, 2009). As mentioned in the Introduction of this volume, Urban Informatics draws "together researchers from various disciplines to focus on problems and opportunities at the intersection of computer science, design, urban studies, and new media art" (Williams, Robles and Dourish, 2009, p. 2). It is not just a site for technological innovation; it is a way by which information about a city could be shared between its citizens.

This paper creates a comprehensive problem statement, which could also be transformed into ideas for an entrepreneurial venture. It provides a meta-level analysis of the possibilities embedded in Urban Informatics for creative industries in Maastricht. It would also offer a set of possible solutions as thought experiments that can be worked with, but given the context of Maastricht, one should be aware that these solutions are generic and would require extensive ethnographic study for a thick description (Geertz, 1973) of the user-base to enable typical modifications for success.

The Why?

Simon Sinek (2009) has developed The Golden Circle, a model based on human decision-making that guides organizations on how to inspire people to support any product, company or idea. The logic of The Golden Circle is embedded in a simple question. How does one idea do so much? The answer to the question is simpler. "It doesn't matter what you do, it matters WHY you do it" (Sinek, Start With WHY). While his book provides insights into organizational behavior, in essence it captures the starting point of a problem-solving exercise. To tackle a primary question with all its complexity, one needs to start at a point of inspiration which is embedded in the reason to find a solution. This reason ultimately drives the rest of the stages of problem-solving.

As the chapters that precede this one have shown, Maastricht is currently witnessing an on-going process of transformation from an industrial past to a creative future. The process is not linear, it involves considerable amount of policy decisions, entrepreneurship, negotiation, participation and a vision for the future. Keller has also shown the inherent contradictions in the understanding of this vision for the future (Keller, this volume). The end-result is seemingly daunting – there is a vast amount of changing information about urban artifacts (streets, buildings) and city design that needs to be captured, classified, stored, retrieved and disseminated. As one can observe from the previous chapters, this information on the process of transformation is spread across a multiplicity of websites and policy documents. The question then becomes as

to how an interested citizen of Maastricht would have access to relevant information through this complex mesh of information.

Dr. P. Calje, a historian at the Maastricht Faculty of Arts and Social Sciences and former member of the project steering group of the cultural biography project commented on the citizens of Maastricht by saying that, "Maastricht has a definite element of localism. Its people are proud of their city" (Calje, Interview, May 7, 2010). This strong sense of belonging has also been observed in "the formulation of the main cultural policy lines for the years 2002-2010 [where] an active engagement with local cultural heritage was advocated" (Heur, Forthcoming 2011) by the Maastricht Municipality. "Drawing on the work of Gerard Rooijakkers, professor for Dutch ethnology at the University of Amsterdam, the notion of cultural biography was adopted to conceptualize the city of Maastricht as a city of shifting identities over time" (Heur, Forthcoming 2011).

The cultural biography project was progressively conceptualized with a digital imperative and "emphasized the need to understand the city as a layered, differentiated and complex phenomenon in which the 'life and social meaning of urban artifacts (streets, buildings) and events are inextricably connected with the biographies and genealogies of city users and inhabitants'. Four core elements of the cultural biography of Maastricht were identified, namely its identity as a Roman establishment, a medieval religious centre, an early modern garrison town, and as an industrial city" (Heur, Forthcoming 2011). If one looks at the website of the project[1], it is a functional information platform in four different languages and has a Forum with 52 posts[2] in total.

In the process of the construction of this website, "the relation between content production [citizen involvement in creating a cultural biography] and technical infrastructure [the website] was seen as imbalanced – 'a lot of overhead for little interaction'. [So,] a more flexible and open digital infrastructure was advocated" (Heur, Forthcoming 2011). But, the website could not be altered to support this advocacy for openness. As a result, the infrastructural limitations of the website began to drive the content logic of the project, which ultimately led to closing-down of the project in the digital domain. The project was later resuscitated by working in the analogue domain (Museums, Exhibitions, Festivals etc.).

The cultural biography project showcases two important aspects about Maastricht. First, as a city, Maastricht is not just interested in the future; it also celebrates its past and believes in documenting it. Second, the experiments with a digital imperative have not been successful in leveraging the strong sense of belonging that the citizens have to their city. Combining these two aspects with the question of how an interested citizen of Maastricht could browse through the complex mesh of information about

1. The URL for Cultural Biography Project is http://www.zichtopmaastricht.nl/
2. Information retrieved on 5th June, 2010.

the city, provides a promising opportunity space for Information Design (Jacobson, 2000), Urban Informatics (Foth, 2009) and the products that could be created out of it. Hence, the fundamental reason to solve the primary question is to be able to capture the interest of the citizens of Maastricht and to channelize it in a fashion that constructs the evolving narrative of the development of Maastricht.

The What?

Again borrowing from the preceding chapters, the plans for the development of creative industries have been developed in combination with the idea of reusing old industrial buildings. Some of these buildings are already vacant (Herberg, this volume), while the others would be vacant in the near future (Reichow, this volume). The idea of re-use instead of reconstruction of these buildings could be seen as a result of the strong sense of attachment that Maastricht has to its past. It could be interpreted within the theoretical framework of conservative surgery proposed by Patrick Geddes. "Patrick Geddes (1854-1932) is hailed as one of the founding fathers of the modern town planning movement, a forerunner of regional planning, the inventor of 'conservative surgery'" (Welter, 2002, p. 1). Geddes advocated 'conservative surgery' as a method by which "the cultural traces of the past could be preserved while adding a further layer of architectural material to the city without an artificial geometric order being forcibly imposed on urban space" (Law, 2005). What the idea implies is a sense of synergy – the architecture of the past being redefined within the constructs of the future, an analogue mash-up in the real world. It showcases two distinctly different kinds of information, one of the past (in terms of heritage) and the other of the future (in terms of creative industries), being combined together into a symbiotic relationship. The question of what should be captured derives its inspiration from this idea.

The cultural biography project aimed at "three layers [of information]: the 'collective memory' of the city, including the 'source material' of buildings, works of art, literary texts, maps, rituals, archives, stories and scientific interpretations; the 'permanent story' including the four core elements [Roman establishment, a medieval religious centre, an early modern garrison town, and an industrial city]; and the 'temporary stories' not in need of 'structural attention or that present the permanent stories from a different (non-direct) perspective'" (Heur, Forthcoming 2011). But, this project only captures the past which is only a part of this evolving narrative. The other two equally important parts are the present and the future.

"The Municipality has an interest in promoting Maastricht as a University City. The problem, of course, is that when you make a transition from Industrial City into a University City, how do you ensure that low-skilled workers are not left out in the cold" (Calje, Interview, May 7, 2010). The present makes up for another core element of the cultural biography of Maastricht. Maastricht as a University City is increasingly changing the demographics of the city and the kind of skill-set it can support. Since most of

the University Faculties have been established in old buildings, it offers yet another example of how the city is redefining its past in the context of the future. For example, the Faculty of Arts and Social Sciences, Maastricht University at Grote Gracht 80-82 "is a powerful classical composition in Louis XVI style. […] This building was designed by Mathais Soiron in 1785 for his two brothers who were canons of St. Servaas and clearly demonstrates the wealth and prestige accruing to his position" (Maclure and Blyth, 1984, p. 80).

As the Introduction (Hölsgens and Ghys, this volume) brings out, the future of the city lies in the development of Creative Industries, which adds yet another dimension to the core elements of the cultural biography. A few of these Creative Industries which have already been established in AINSI (Reichow, this volume) create another important node for information connecting the present to the future. Within each part of this cultural biography is a space for information exchange, communication and discovery waiting to be explored and documented. Here one has to note that the use of the term *Cultural Biography* is intended to carry forward an existing metaphor for information design in the context of Maastricht. It has to be re-discovered, re-invented and renovated to work successfully with a combination of the analogue and the digital. The working functionalities of cultural biography would be discussed in 'The How?' section of this paper, but essentially 'The What?' of the primary question finds its answer within the metaphor of the cultural biography of Maastricht.

The city has a "persistent role as a container for information-based human activity. […] Information processing is an age-old function of cities – as Mumford (1961) noted, writing and urbanization were more or less simultaneous historical developments" (Townsend, 2009). Information on a city is a complex mesh of inter-connected entities that inform each other. Categorizing these entities in the context of time, one can observe that a city operates with a memory of the past working on its present with a sense of the future. Each of these individual temporal categories do not function independently, they keep evolving as they are continuously informed by each other. The memories embedded in the past are re-calibrated by the needs of the present and the future. The workings in the present are reorganized by the sense of the past and the future. The sense of the future is envisioned based on a syncretism of the past and the present. One possible way of understanding this dynamic relationship between entities is to invoke the concept of rhizome (Deleuze and Guattari, 2004).

"A city resembles what Deleuze and Guattari describe as a rhizome. The rhizome is a philosophical network structure where every part is necessarily connected with every other part of the system. There are no preferential connections because every connection alters the overall network structure. As a consequence, the rhizome cannot be plotted since the plotting action itself is a part of the rhizome and thus in the very moment of plotting its structure, the structure changes" (Calabrese, Kloeckl and Ratti, 2009, p. 391). 'The What?' in this sense, is basically an attempt to capture this rhizome for Maastricht – a synergy between the past, the present and the future. The attempt

itself raises a philosophical fallacy, if the structure changes by the very act of plotting it, there could possibly be no way by which the plot could represent the structure. The only way out is to understand that the intention is not to capture the actual rhizome which is usually visualized as a three-dimensional network structure to portray the city that lives and breathes. The attempt is to capture the impressions of a city on time, its citizens and its visitors and it has to be built upon the philosophical construct of rhizome as a foundation.

The Where?

> "*On Exactitude in Science*… In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography.
>
> - Suarez Miranda,Viajes de varones prudentes, Libro IV,Cap. XLV, Lerida, 1658"
>
> (Borges, 1999)

On Exactitude in Science, though written in the form of literary forgery, captures the possibility of representing a place to its exact measurements in a map. The map then becomes an open invitation for information representation subject to individual interpretation. While the city as a shared space is beyond the possibility of individual personalization (except private property in a city), a map offers this possibility along with the possibility of a mash-up where individual ideas could be aggregated together to represent the imageability (Lynch, 1960) of a city. Imageability as defined by Lynch is "that quality in a physical object which gives it a high probability of evoking a strong image in any given observer. It is that shape, color, or arrangement which facilitates the making of vividly identified, powerfully structured, highly useful mental images of the environment" (1960, p. 9).

'The Why?' section gives another aspect to where the solution must be located. Since, the primary reason to create such a cultural biography is to capture the interest of the citizens, the way it has to be done is to make the solution pervasive, easily accessible and easy-to-use. In short, the solution has to be *inclusive*. This location is based on an inherent assumption, that given the right tools the citizens of Maastricht would be willing to participate in creating the cultural biography of the city. This as-

sumption could be validated by first looking at the level of interest that people have in Public Engagement (Hölsgens, this volume) and secondly within the ideas proposed by Geddes to explain citizenry and civics. Geddes had faith in citizenry – "like flower and butterfly city and citizen are bound in an abiding partnership of mutual aid."(Branford and Geddess, 1919, p. 24). He also had a compelling notion of civics – "Civics deals with all that appertains to the life and surroundings of any citizen, and includes far more than the spheres of legislation and administration" (White, 1927, p. 7).

Revisiting Heur's explanation (Forthcoming, 2011) for the digital imperative being an impediment in the construction of the cultural biography of Maastricht, one could find two reasons for it. First as mentioned in his paper, it seems to be the lack of technical expertise to implement the vision in its original state. In terms of Simon Sinek (2009), the 'why' of cultural biography got altered because of the 'what' of the digital imperative. The inability to uphold the major reasons as to why the project was being carried forward, ultimately led it into becoming an information platform instead of being a collaborative venture. Secondly, it could be understood within the Geddesian notion of *work-Place* in one of his "most sophisticated thinking machines" (Welter, 2002, p. 31), called the *Notation of Life*, which provides a visual representation of the process of transforming a town into a city. This paper borrows its fundamental conceptualization of Urban Informatics applications by placing them within the construct of *Notation of Life*. Despite being an essential part of this paper, the detailed discussion on the *Notation of Life* has been moved to the Appendix to provide a balanced overview of the case study under consideration without getting into a philosophical debate on the *Notation of Life* and its applicability to Urban Informatics. Please refer to the appendix for that discussion.

work-Place as Geddes defines it, is the place where occupations are carried out. For example, the mine would be the *work-Place* of a miner. In the context of the cultural biography, the *work-Place* was envisioned as the representation systems that were used to interact with the users. For example, the website, the timeline, the maps and the section on 'Take a Walk-Mobile' with multimedia tour, street plans and theme walks. But, this is only half of the work-Place of the cultural biography project. The city itself with its urban artifacts forms the second half of this *work-Place*. In other words, the city that is being represented also should have been an integral part of the cultural biography project.

Taking an example for Urban Informatics, a mobile application for tour of a heritage site would involve both the representation system on the phone and the heritage site itself within the paradigm of *work-Place* of the application. It is important to look at the nature of this application here. It acts as a map of the heritage site, not a trace in the Deleuzian sense. While explaining the conception of rhizome, Deleuze wrote that "what distinguishes the map from the tracing is that it is entirely oriented towards an experimentation in contact with the real." (Deleuze and Guattari, 2004, p. 13) The

connections represented on a map move beyond physical and straight-forward connections represented in a trace. A trace is a copy of the original; a map operates on the symbolic level of representing the original while creating a possibility of interpretation and redefinition of the original. The element of 'experimentation with real' in Deleuzian philosophy creates the scope for an interaction that operates in an intermediate phase.

The experience of the mobile application is neither completely a part of the digital interface nor the analogue heritage site. It is somewhere in between the two, where the experience would change depending upon the information presented on the interface (historical information would have a different effect as compared to plans for the future) and the sensorial impact of the heritage site. This intermediate phase is filled with a sense of ambiguity, openness, and indeterminacy because it could be structured and experienced in a multiplicity of ways. The closest examples that could be used to create a sense of this condition would be a no man's land between two countries or an anthropological understanding of rites of passage to define moving from one phase of life into another. The no man's land is an intermediate space between two countries. Similarly the rites of passage form an intermediate phase in time that exist between two different phases of life. In anthropology, the term used for this condition is liminality (Turner, 1964). Liminality is derived from the Latin word 'limen' which means a threshold. As an idea liminality exists between two individual concepts, outside their individual realms but still connecting them together. Hence, it could be used to describe the experience of an Urban Informatics application.

Evaluating the cultural biography website as an Urban Informatics application, one can observe that it provides a virtual tour of the city of Maastricht and when it does provide for a tour using a mobile device (with or without GPS), the application only works for Windows Mobile devices. Thus, by limiting possibilities in the technological framework of the cultural biography project, it limits the number of users who could access this information. The solution lacks *ubiquity*. Ultimately, the progressive conceptualization of the cultural biography project with a digital imperative seems to have lost focus in encompassing the liminality of the combination of the digital (website) and the analogue (Maastricht city), cross-platform compatibility for devices such as the iPhone and the ability to create individual walkthroughs and share it with other users.

Brian Massumi (2002) in his discourse on digital technologies said that the digital is sandwiched between analogue experiences. The entire experience of the digital is based upon an analogue interpretation of the input and the output. An example that could be looked upon is word processing. "All of the possible combinations of letters and words are enveloped in the zeroes and ones of the ASCII code. You could say that the entire language systems are numerically enveloped in it. The words appear on the screen, in being read. Reading is the qualitative transformation of alphabetical figures into figures of speech and thought. This is an analogue process. Outside its appear-

ance, the digital is electronic nothingness, pure systemic possibility. Its appearance from electronic limbo is one with its analogue transformation" (Massumi, 2002, p. 138). In this sense, the digital to a certain extent should always be seen as a facilitator for the analogue experiences, without being an end in itself.

'The Where?' of the primary question around capturing the evolving narrative of the development of Maastricht is centered on open-access to information sharing and collaboration between citizens. The simplest way of doing it is to create a liminal experience that combines the experience of being in the city with a digital platform for sharing information about the city. When places and their associated meanings are easily accessible, shared and transformed using digital tools, it is not just the visitors who feel comfortable walking around like a *fláneur* – who "move through space (slowly, aimlessly, yet still moving), look (the space may be saturated with commodities on view), and imagine" (Williams, Robles and Dourish, 2009, p. 6). It is also the citizens who gain a sense of collaborative spatiality – "the perception, as well as the experience, of urban spaces [can be] partly shaped by the collaborative activities within groups. For example, through car clubs BBS, people build a 'City-Wiki' including trip routes, cheap parking manuals and a GPS guidebook to share their mobility experience and knowledge" (Shang, Doulet and Keane, 2009, p. 388-398).

The How?

Edward O. Wilson came up with an endearing idea when he wrote, "Imagine an electronic page for each species of organism on Earth, available everywhere by single access on command. The page contains the scientific name of the species, a pictorial or genomic presentation of the primary type specimen on which its name is based, and a summary of its diagnostic traits. The page opens out directly or by linking to other data bases, such as ARKive, Ecoport, GenBank and MORPHOBANK. It comprises a summary of everything known about the species' genome, proteome, geographical distribution, phylogenetic position, habitat, ecological relationships and, not least, its practical importance for humanity. The page is indefinitely expansible. Its contents are continuously peer reviewed and updated with new information. All the pages together form an encyclopedia, the content of which is the totality of comparative biology" (Wilson, 2002).

His idea became what is today known as The Encyclopedia of Life[3]. Capturing the evolving narrative of the development of Maastricht spread across the collective memories and aspirations of its citizens, pages of history, policy documents of the Maastricht Municipality and its urban artifacts and infrastructure is a task quite small as compared to creating an Encyclopedia of Life. But before one grapples with the expanse of information that needs to be collected, classified, stored, retrieved and

3. The URL for The Encyclopedia of Life is http://www.eol.org/

disseminated, one has to first realize that it cannot be done within a single exercise in urban informatics and related information design. The project should be broken up into a set of smaller projects that tackle each of the core elements as defined in 'The What?' section individually before integrating them. In terms of systemic thinking, the answer lies in modularity – the extent to which a system's components may be separated or recombined. Information about each of these core-elements has to be complete within itself such that one could operate independent of the other.

The simplest way of doing it, is to start with maps. The same city map could be open to infinite possibilities of interpretation. A map that captures Maastricht as a Roman establishment is different from a map that captures Maastricht as a medieval religious centre or an early modern garrison town or an industrial city or a University City or a Creative city. If the information available for each of these maps is combined with the ability to geo-tag buildings and has customized walkthroughs that enable a different experience of the city every time with new information, then the first step towards creating a curiosity towards the idea of the cultural biography project can be accomplished. Maastricht has a unique advantage when it comes to creation of these walkthroughs. Since it is a small city, the walk around the city can be completed on foot in a maximum of 3-4 hours.

Now building a few scenarios, consider standing in front of the Town Hall and the hand-held device with an in-built GPS locater identifies your location and provides access to photographs as to how the exact same place looked 100 years ago or how it looks in the winters if you visit during summers. Consider the cultural biography project as an extension of Geocaching – "a high-tech treasure hunting game played throughout the world by adventure seekers equipped with GPS devices. The basic idea is to locate hidden containers, called geocaches, outdoors and then share your experiences online" (Welcome to Geocaching). These hidden containers could also provide information about the site in which they are located. Now, consider charging a nominal amount of money for hints to the location of these hidden containers to make profits.

After creation of a few customized walks designed to start off the project, consider an open-platform where citizens can make their own walks and describe their impressions of the city artifacts – a map-specific version of City Flocks which is "a mobile information service for public urban spaces. The system is managed by local urban residents and is designed to tap into their tacit social knowledge. City Flocks allows participants to operate their mobile phones or computers to leave and access virtual recommendations about community facilities, making them easily accessible for other people employing user-generated tags" (Klaebe et al., 2009, p. 188). These virtual recommendations are spread across a map that can be traversed as a walk-through. Consider an application that works on a similar principle as Google AdWords, where local businesses specify the words that should trigger their ads and the maximum amount

they will pay per click for searches performed on this platform. The cultural biography project could ultimately generate revenue out of this application.

But, this is simply the tip of the iceberg. The possibilities for Urban Informatics projects for the city of Maastricht are endless. One of the ways to capture these possibilities in a comprehensive way is to look at the *Notation of Life* created by Patrick Geddes. Geddes used it to explain the transformation of a Town into a City. But, if one treats it as an exercise in information design that captures a multiplicity of practical factors that determine urban development, one can locate a plethora of possible interventions with digital technology mediation.

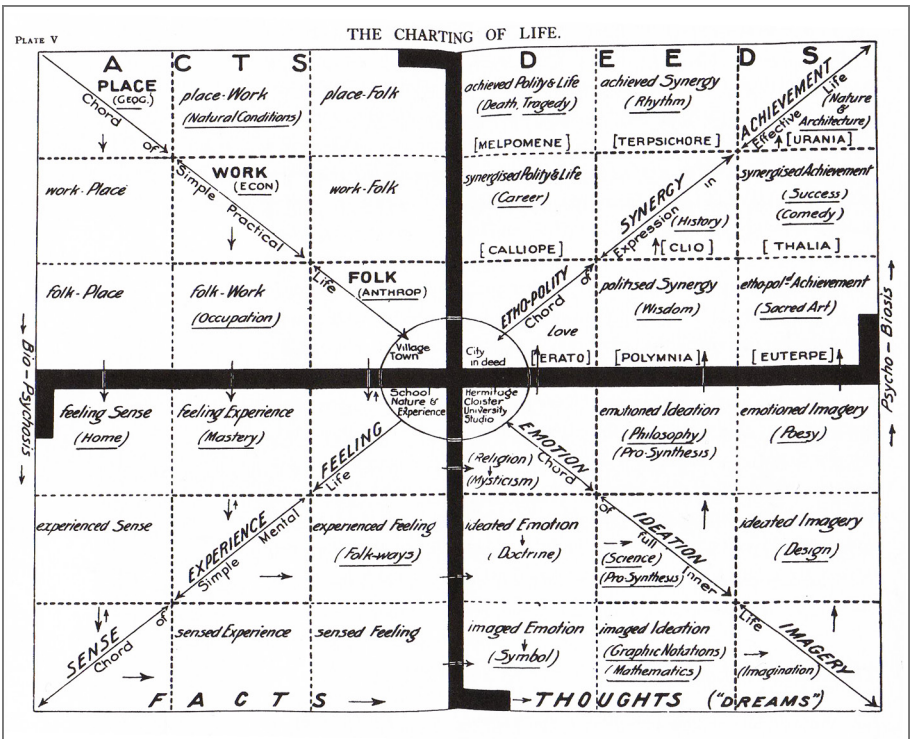

Figure 1: *Notation of Life* (Welter, 2002, p. 32)

Primarily interested in architectural town-planning, Geddes intrinsically captured an additional layer of information sciences by his *Notation of Life*. Within the inherent structure of this diagram, lies a lifeworld of connections and flows that inform each other and drive towards an understanding of the complexity in designing change for a place. One of the important achievements of *Notation of Life* is that Geddes did not assume that the flow is mono-directional. The town does not continuously flow towards the city in its process of evolution; the city devolves into a town as well. This

map of interconnected parameters can be looked at as a complete lifecycle of the idea of change in an urban context. In mapping these flows, there is an intrinsic possibility of understanding the nature of interventions and how they change the urban fabric of cities. One can look at the Appendix of this paper for a detailed legend explaining the *Notation of Life*.

Geddes used *Notation of Life* to explain his conception of Town Planning as an activity that is encapsulated within the hybridity of the biological notion of evolution and the spirituality of collaboration between the inhabitants of the city. Geddes believed that places eventually evolved into cities, a process he considered synonymous with Darwinian evolution. Evolution as a process is dependent on a multiplicity of factors ranging from environment to individual traits of particular species, on a very similar note, Geddes believed that it takes a combination of place-work-and-folk (place-occupation-community) to create the conditions that initiate this process of evolution. Within this combination lies the dilemma of a catalyst – a factor that eventually causes the entire system to come together and operate in unison. Geddes believed that this catalyst was something that couldn't be explained by the laws of Science – something innately exquisite, something that he called Spirituality. If one does delve deeper into his conceptualization of this notion, it seems that he was primarily referring to idiosyncrasy of events and acts that emerge out of citizen involvement, when he wrote, "the City Beautiful must be the result of its own making… it is the expression of the soul and mood of its people" (Geddes, 1913, p. 199).

Citizen involvement has been studied quite thoroughly over the years and a few ways to encourage it within the digital paradigm is to afford cross-platform compatibility and an open system to tinker with. If technology is seen as a tool, instead of an end-product, the possibility of participation becomes higher. For example, the open application programming interface (API) that social networking websites such as Facebook and devices such as iPhone and Android provide to its users to generate their own applications. Additionally the maps should work on all browsers and all the different kinds of media (Windows mobile devices, iPhone, Android, Blackberry, Laptop, etc.) that people use to access digital information. To start with one could offer specialized devices with these maps from the Tourist Center VVV and then extend progressively towards universal access. The other aspect is to ensure a presence in the digital media that is already being used by people. For example, offering membership of a group on cultural biography project on Facebook, Flickr, Hyves, etc. and developing equivalent pages on each of these social networking websites that capture the essence of the project and its objectives. These connections should also be reflected on the website of the project. For example, the photographs uploaded by the members of the groups relating to the cultural biography project could be showcased on the website automatically. Simply put, the easier the process of participation, the more is the extent of participation.

A recent experiment conducted in analogue city space within the context of Urban Informatics was called Urban Play by Scott Burnham – a creative director, strategist and writer working with design and urbanism as open platforms. Urban Play was "a project [he] created for the city of Amsterdam in collaboration with Droog Design, which explores open approaches to design and creativity in the city. From September to December 2008, the IJ waterfront area of Amsterdam was transformed into a creative playground where people could interact, alter and rework a series of design installations. To use a software analogy, the designs were installed in version 1.0, and it was up to the public to develop them into version 2 through individual and collective creative intervention" (Burnham, Projects). Participation in the design of Urban Informatics applications needs playful encounters. To be able to play with technology as a tool opens up the scope of creativity in determining new applications. Re-using old buildings for new ventures also creates the possibility of a playful encounter with the historicity of these buildings on a similar note.

'The How?' as mentioned in the beginning of this paper is a function of the clarity of problem formulation and the creativity embedded in looking for a solution. It can be claimed with certainty that if one considers the primary question to be worthy of a solution, ultimately it would be achieved. There seems to be no evident technological limitation for the project. Borrowing from Einstein's (Klein, 2004, p. 31) quote all that is required is the ability to experiment with solutions. Solutions that would inevitably require iterations as explained by Tom Wujec (2010) using the Marshmellow Challenge. The Challenge is simple – teams of four have to build the tallest free-standing structure out of 20 sticks of spaghetti, one yard of tape, one yard of string and a marshmallow in 18 minutes. The marshmallow has to be on top. As he elaborates on the results of about 70 design workshops across the world with students, designers and architects, the results seem to be astonishing. The best performers in this challenge are kindergarten children, second only to the architects. Not only do they produce the tallest structures, but they produce the most interesting structures of them all. The reason for it as Wujec explains is that kindergarteners start with the marshmallow, and they build prototypes, successive prototypes, always keeping the marshmallow on top, so they have multiple times to fix ill built prototypes along the way. Designers recognize this type of collaboration as the essence of the iterative process. And with each version, kids get instant feedback about what works and what doesn't work.

Problem-solving as a process is dependent on this kind iteration to reach the solution. Considering the level of investment that they require, a better idea would be to experiment with low-fidelity prototypes that could be analyzed in relation to their expected function. The failure of the cultural biography project with a digital imperative (Heur, Forthcoming 2011) needs to be looked at as just another step in the process of constructing the evolving narrative of the development of Maastricht. The project in itself has a great potential to capture the interest of tourists and citizens alike. All that is required is a continuous process of iteration until a solution is discovered. The limita-

tions that one could think of are the initial investment in terms of time and resources that undertaking this project would involve. The return on investment would be based on the extent of user-participation, which would require an end-user ethnographic study to determine their expectations and needs in relation to information access.

Conclusion

Creativity as a process does not recognize dead ends. Solutions do fail and sometimes they fail more often than expected. The idea is to be able to learn from each of these failures and work towards a better one. The problem with a well-defined question is that it is still a question and a question is not a solution. This paper captures the logic of the problem of capturing the evolving narrative of the development of Maastricht with a case study of the cultural biography project. The project created to capture the interest of the citizens of Maastricht in documenting its past could also be used as a starting point for a larger discourse on the scope of Urban Informatics and Information Design.

One of the ways to look at this scope is to explore the possibilities within the *Notation of Life* created by Patrick Geddes. The underlying idea in using the *Notation of Life* is to have a sense of a playful encounter with it. His philosophy is not a strict structured guide that captures the transformation of a town into a city. It is a structured method of ideation around city-planning – an ideation that requires a deep sense of connections that inform each other. If used playfully it could inform a lifeworld of Urban Informatics applications and the rationale for changes that could be made to make them successful. With a growing interest in creative industries, this paper could be viewed as a potential platform to create an entrepreneurial venture that explores the city in combination with interactions with the Municipality for infrastructural support, the University for intellectual support and the citizens and local businesses as clients.

There is certain openness to the way a city can be perceived as a playground of possibilities. Citizenship as a discourse isn't simply a function of engagement or participation; it is also about a lifestyle that the city creates around itself. To live in a city is to engage with it on a day-to-day basis, to experience its artifacts and to maneuver through it with a sense of belonging. Geddes brought out the inherent attachment that a place inevitably creates within the people who occupy it, by referring to this interaction as 'Spirituality'. "To renew towns as cities, and to establish new cities, requires 'not only new dwellings for the people, but new houses for the spirit.' […] But both tasks are not of the same importance, because a true city depends first of all on a new spirit, which subsequently leads to 'new dwellings for people'" (Welter, 2002, p. 240-241). To be able to leverage this spirit is to be able to look at a city as a community integrated within material and immaterial structures and functions – a community that can capture the evolving narrative of urban development.

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Appendix

Exploring the scope for Urban Informatics within *Notation of Life*

The *Notation of Life*

This appendix elaborates upon the framework *Notation of Life* that Geddes used to explain his conception of Town Planning. Geddes was also a biologist interested in the theory of evolution and he created the *Notation of Life* as a map to locate evolution within the narrative of city-planning. His intention was to capture the gradual progression of a town into a city with schools of thought and cloisters of knowledge as the intermediary steps. He believed that the interaction between place-work-and-folk as the formative building blocks of a town would eventually develop into schools of thought – a higher sense of perception about the place and its sensorium. These schools of thought would reflect upon these perceptions and would create the platform for knowledge creation about the city – arenas that he defined as cloisters to signify this stage of knowledge creation. Once this knowledge is applied within the context of the place which used to be a town, it develops into a city. This marks the end of the evolution cycle of a place. Geddes believed that living in a City was most refined form of human existence. For Geddes the town and the city existed in out-side world or out-world, while schools of thought and cloisters were a product of the human mind or the in-world (Welter, 2002, p. 26-53). The simplest way of understanding this philosophy is to look at Figure 1.

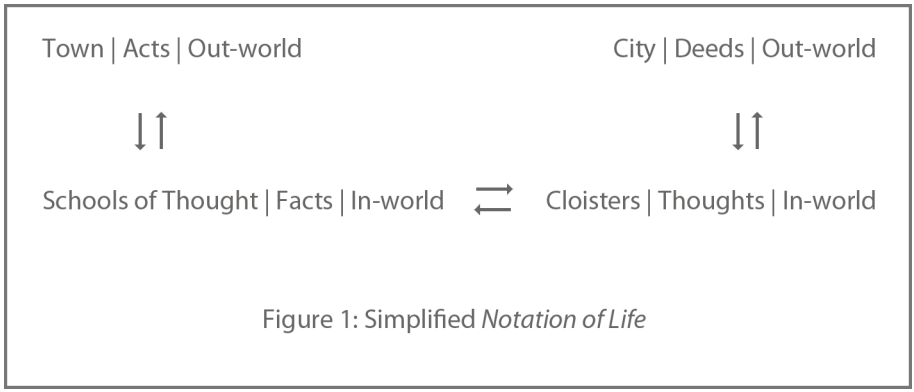

Figure 1: Simplified *Notation of Life*

One can observe that the flow in Figure 1 is not mono-directional. The town does not continuously flow towards the city in its process of evolution; the city devolves into a town as well. An

important aspect of *Notation of Life* is the transformation of a citizen from a passive observer to an active participant. A transformation in the "in-world" of facts into thoughts that later translates into "out-world" of acts into deeds. The terms acts, facts, thoughts and deeds are explained later in the attempt to connect Geddesian philosophy with Urban Informatics. Coming back to the process of afore-mentioned transformation of a citizen, Geddes did not explain this process and associated it with Spirituality. "To leave the step from the passive to the active in-world not only unexplained but mystified undermines the value of *Notation of Life* as a coherent theory. Yet this was no problem for Geddes. Even if the central aspect of human life is beyond human understanding, it is not beyond experience and can therefore be exploited for future development" (Welter, 2002, p. 46).

Geddesian "analysis of the forces and events that create and shape the human environment, undertaken in order to understand why and how human life organizes itself spatially and socially in the form of cities, hardly qualifies as a theory according to the definition of the term in the natural sciences. […] Geddes was more concerned with persistently proving the correctness of his ideas by illustrating their wide applicability, than with exploring their creative exploitation in changing urban and architectural situations in different cities" (Welter, 2002, p. 250). The analysis of *Notation of Life* given below in the form of tables is to use the applicability of the parameters that he created for city-planning. It is not the intention of this appendix to prove that Geddes had a coherent theory. Geddes did not address the *Notation of Life* as a theory; he believed it to be a thinking machine – the way by which cities could be thought about, instead of being theorized. The *Notation of Life* is an exercise in information design that captures a multiplicity of practical factors that determine urban development. It is not a theoretical framework to explain city development but a set of parameters that could be used to create meaningful interventions in city development. The question that would be addressed by this appendix at the most elementary level could be summarized as: How would Geddes understand and relate to a world with the possibility of information mash-ups that can drive what he believed to be mystical Spirituality to create the path of evolution of Cities?

Beginning with the original *Notation of Life* (see Figure 1 in Singh, this volume), one needs to explain the meaning of each of the 36 blocks within the framework of intervention design. Intervention design in this particular context means the process of locating, thinking about, channelizing and ultimately creating interventions for city development using technologies such as Urban Informatics applications. It is about looking at the possibilities within *Notation of Life* for a life-cycle of engineering change in the way a city is perceived by its inhabitants.

Acts | Town

Geddes thought of the parameters under the classification of 'Act' as the markers of a Town. These are initial tangible and explicit characteristics of the out-world. The triad of place-work-and-folk is a characteristic of every known civilizational settlement. These can also be looked at as the foundational building blocks of any geographical location. "The nine categories applied to any town provide a picture of the objective life, the 'everyday world of action'. A town ana-

lyzed as such Geddes names 'Town proper'" (Welter, 2002, p. 34). An intervention is only possible within the interactions between place-work-and-folk. In this sense, Acts define the location of an intervention. Table 1 will capture the nine blocks that define Acts.

Table 1: *Notation of Life* | Acts

Place	Place is a marker of location, it comprises of the environment supports existence in a particular space. The idea is of a topographic ecology which encompasses the paths, edges, districts, nodes and landmarks of a place in Lynch's terminology (Lynch, 1960). While Lynch created these elements with a city in his mind, they are elementary cognitive mental maps for any geographic location. In the context of Urban Informatics, a place can be understood in terms of its GEOCODE and the media content that is available for a particular place, viz., text, photographs, videos etc.
place-Work	"Work, conditioned as it primarily is by natural advantages [that a place offers], is thus really first of all place-Work" (Geddes, 1905, p. 71). An example of place-Work, in this sense, would be mining in a settlement rich in mineral resources. Here, it is important to note that advantages that a place offers don't necessarily have to be natural. Work sometimes grows into the identity of places. For example, places like the San Francisco Bay Area and Bangalore are known for their high technology impetus. In this sense, place-Work captures the inclination and preferences that people of a particular place have towards any activity. In the context of Urban Informatics, place-Work can be understood within possibilities of mediation. How to leverage the inclinations and preferences of people in the context of their activities to create meaningful applications? For example, in Maastricht, people prefer using a bicycle instead of a car to travel locally within the city. A map that captures bicycle routes instead of car routes or walking routes could be a useful in the context of Maastricht.
place-Folk	Geddes addressed place-Folk with an additional name of 'Natives.' In this sense, place-Folk would be a reference to the psychology of behavior or sociability pattern that is characteristic of or existing by virtue of geographic origin. The idea is to capture the influence of the lifeworld of a place on its people. Despite the rapid globalization of city populations, places leave unique impressions on their inhabitants. In the context of Urban Informatics, place-Folk would involve a certain sense of localization. Localization refers to the process of adapting a product or service to a particular language, culture, and desired local look-and-feel.
Work	Work is an all-encompassing term that Geddes associated with citizen activities. A range that starts with the primary idea of occupation to the everyday

	routines that citizens follow. It ultimately captures the movement of people in a city. In the context of Urban Informatics, the prime focus of the work would be to create metaphors for urban dialogue. Every intervention created by Urban Informatics for the city would inevitably impact how people communicate and move in a city. The starting point of this intervention is an application that creates consciousness about city life. It acts as a vantage point from which city life could be redefined. It's not simply about communication but it is about how the city space is perceived and understood by the citizen. These metaphors / applications should be looked at as enablers of citizen activities.
work-Place	The place where occupations are carried out is a work-Place. Continuing the example of mining from place-Work, the mine would be a work-Place. "[…] the field or garden, the port, the mine, the workshop, in fact the work-Place, as we may simply generalize it" (Geddes, 1905, p. 71). In the context of Urban Informatics, work-Place would ideally be a combination of the representation systems that are used to interact with the users and the city itself. For example, Satellite/Hybrid Maps, Heat Maps, Graphic Visualizations of City Data combined with actual places for which an urban informatics application is developed. For example, roads and a GPS navigation system both work together as the work-Place for an application that provides directions from point A to B in a city. An application for tour on a mobile phone of a heritage site would involve both the representation system on the phone and the heritage site itself within the paradigm of work-Place of the application.
work-Folk	This category could also be referred to as 'Producers' in Geddesian terminology. "Geddes identifies the same group of people as being 'Natives' or 'Producers', thereby referring to their changing roles within a society" (Welter, 2002, p. 34). Behavior is also a function of everyday activities. Citizen don't just imbibe characteristics from a place, they also play a causal role in changing the place by their actions. In the context of Urban Informatics, an application can play a causal role by becoming an everyday activity of citizens. For example, citizens recording air quality at various city locations could inform city-wide pollution levels. Or it could enable activities of the citizens by enabling them to make informed decisions. For example, "considering real-time environmental data like air quality, noise, or pollen flow together with the traffic situation and personal health conditions, [to suggest] ideal jogging routes" (Calabrese, Kloeckl and Ratti, 2009, p. 398-399).
Folk	"With their life structured by work and influenced by the conditions of place, the residents would form a folk with a common superstructure of shared

	beliefs, traditions and customs" (Welter, 2002, p. 34). This common superstructure is the implicit contract that keeps the city lively and functional. It defines the expectations that citizens have from their surroundings and the operational dynamics of their everyday lives. In the context of Urban Informatics, an application should be deemed successful if it becomes a part of the folk of the place. The overwhelming acceptance of Mobile phones as an everyday device could be seen as an example of this idea. Establishing a context for an application comes from folk. Since it is the people who would eventually be using the application, understanding their needs (expressed or observed) would be elementary to successful design of applications and devices.
folk-Place	Considering time as a factor, the superstructure of shared beliefs, traditions and customs is constructed out of three possibilities, memories of the past, activities of the present and expectations from the future. The folk-Place is the seat of the past or more significantly of collective memory. It is about the perceived past which is embedded in the very fabric of a place. Collective memory is not history. The most appropriate way of defining it would be that "Collective memory is the ongoing collaborative re-casting of 'the past' –of a particular group, event or experience– in the present" (Hoskins, 2001, p. 336). The culture of a place is informed by the perception of its past and the ability of a place to carry it forward into the future. In the context of Urban Informatics, this perception of the past is a knowledge mine of information and collaboration between citizens. It not only could be used to portray the image of a city with information attached to GEOCODEs of places, it is also a way of remembering the past within the technological framework of the present. In this sense, an Urban Informatics application is a useful tool to be used in the context of collective memory.
folk-Work	Within the superstructure, the idea of folk-Work is the seat of the present and the future. Everydayness of life in itself creates rituals of practice and scope of expectations. Looking at technology as an enabler, the user expects life to become easier with its use, but therein lies the dilemma of a multiplicity of expectations, usage patterns and activities that need to be catered to. In the context of Urban Informatics, one of the ways in which a design team can cater to these varied set of possibilities is by creating user profiles/archetypes. There are two primary concerns: 1. Why make an application? What will it achieve? 2. Who would the different types of users who might use the application?

	The design of an Urban Informatics solution is ultimately as successful as the answer to how the folk of a place be classified into profiles/archetypes so that their needs (expressed or observed) might be understood and targeted by the application?

Figure 2 compares the Acts blocks of the original *Notation of Life* diagram with the ones adapted to the Urban Informatics context.

Acts | Town | Original			Acts | Town | Adapted		
Place	place-Work	place-Folk	Place	place-Work	place-Folk
Geography	Natural conditions	Natives	Geocoding Media Content	Work inclinations & preferences of people	Localization
work-Place	Work	work-Folk	work-Place	Work	work-Folk
Places where occupations are carried out	Economy	Producers	Representation systems & City Infrastructure	Creating Metaphors for Urban Dialogue	Causal role in Everyday activity
folk-Place	folk-Work	Folk	folk-Place	folk-Work	Folk
Collective Memory	Occupation	Anthropology	Geocoding collective memory	User Profiles / Archetypes	Understand needs (expressed or observed)

Figure 2: Comparison of blocks of Acts

Facts | Schools of Thought

The Town proper is "supplemented with, or reflected in, the subjective life made up by the corresponding 'thought world'" (Welter, 2002, p. 34). A thought world that Geddes defined as Schools of Thought. Geddes used "psychological terminology [to elaborate upon] how this mental life of Facts, […] comes into being as a reflection of Acts" (Welter, 2002, p. 38). This is the first step into the in-world of the mind. The physical aspects of a place lend themselves into cognitive mental maps of the place. An intervention is not simply about a plan to change the physical aspects of spaces. It is about creating a space where change itself feels right and is acceptable. In this sense, Facts define the impressions left by an intervention. Table 2 will capture the nine blocks that define Facts.

Table 2: *Notation of Life* | Facts	
Feeling	Feelings were the next logical step from folk for Geddes in the process of transformation. "Our feelings are obviously developed from our folk, in earliest infancy by our mother's love and care" (Welter, 2002, p. 38). Feelings are folk certifications for interventions. They are determined by the superstructure embedded in folk and one has to systematically embed an intervention within this superstructure to ensure that the intervention has the right feel to it. The Geddesian notion of 'conservation surgery' falls under this category. The idea of maintaining the continuity of time by adding an additional layer of architecture without completely altering the original structure is to value the feeling that the original building generates. In the context of Urban Informatics, skeuomorphism could be looked at as a possible example. "Skeuomorphs are derivative objects that retain structurally necessary elements of the original as ornamentation, stripped off their original function" (Shepard, 2009, p. 449), e.g., the mechanical shutter sound produced by digital cameras. Extending this idea, new functionalities within old devices is also a possible solution, e.g., current research on mobile phones to add sensors that monitor air quality (Paulos, Honicky and Hooker, 2009, p. 414), cameras with an in-built GPS device etc.
feeling-Sense	"Memory, Geddes explains […], means to recall in the evening, when going to bed, the garden one has played in during the day. What happens is another sort of looking… The garden has come with you; it is in your in-world now" (Welter, 2002, p. 41). The environment as perceived by our senses becomes embedded in the mind. Geddes defined it within the idea of the comfort and a feeling of belonging that comes with being "home." It could also be understood as Place attachment – "the emotional, functional and social ties people develop within a community and towards a particular place" (Morgan and Polson, 2009, p. 157). In the context of Urban Informatics, one can leverage these memoires within the paradigm of place-based blogging. "Place-based blogging is an article or story along with follow-up discussion centered around a physical location; possibly a location sensitive application" (Carroll and Ganoe, 2009, p. 352).
feeling-Experience	Memory is not just a function of the environment; it operates on a combination of environment and activity to create meaningful reminiscence. The notion of feeling-Experience is to focus on the activity part. The city as a space is an open invitation for exploration and discovery. One has to act upon this invitation; feeling-Experience is the state of mind that registers these activities as reminiscence associated with the city – a feeling of "mastery" over everyday activities in a city.

	In the context of Urban Informatics, there are a multiple set of applications that have been developed or devised to enable a *fláneur* – "literally translated as 'stroller', the term 'mall rat' might better capture the spirit of the word […] The *fláneur* moves through space (slowly, aimlessly, yet still moving), looks (the space may be saturated with commodities on view), and imagines" (Williams, Robles and Dourish, 2009, p. 6). For example, a mobile application that combines the ability to take a video of a walk across the city with the ability to geo-tag the movement, such that the video could also be simultaneously represented on a map. This application could be seen as a new form of digital storytelling which refers to the use of digital tools by which ordinary people can tell their own real-life stories.
Experience	"Our experiences are primarily [derived] from our activities, of which our work is increasingly the predominant one" (Welter, 2002, p. 38). Activity defines the action in a city. In the very act of doing, one creates a narrative of needs that need to be catered to. Put very simply, people need things to do things. Experience is the category that necessarily requires a Geertzian "thick description" (Geertz, 1973) to create a deep understanding of life in a city. In the context of Urban Informatics, every activity is a potential point of informational mediation for better experiences. For example, "it often happens that one knows exactly what product one is looking for but still ends up driving [or walking] from one place to the other to actually find it. Product-availability information already exists in digital form in logistics databases for most shops. Being able to consider this data together with proximity and store hours would make moving physically through the city in search of a product or service more efficient" (Calabrese, Kloeckl and Ratti, 2009, p. 399).
experienced -Sense	Experience transforms into knowledge about spaces and the perceptions they create. A city is built upon experiences that indulge the senses and over time, these experiences could be re-experienced. For example, knowing a good place to eat or the annual celebration of the Carnival in Maastricht. The idea of experienced-Sense is not about memory of the experience, but the knowledge of the experience. In the context of Urban Informatics, it is primarily about enabling a citizen to indulge his senses by locating events and experiences. For example, "Sightseeing in a city often involves finding long queues at popular sites. Knowing in advance about the wait situation at different sites will help the sightseer to organize a visit that allocates more time to actually seeing the sights than to waiting for them" (Calabrese, Kloeckl and Ratti, 2009, p. 399).
experienced - Feeling	Geddes addressed experience-Feeling as "Folk-ways." He believed that within the everydayness of city life are rituals and traditions that citizens can choose to be a part of. For example, commuting in a city.

	In the context of Urban Informatics, applications that enable these rituals have a higher probability of success. For example, "instead of waiting at the bus stop for a bus that theoretically adheres strictly to a static timetable but in reality deviates from it, having access to real-time information about bus locations promotes a more flexible approach to using the public transport system, allowing users to arrive at the stop when the bus is about to turn the corner or to use an alternate bus line to get close enough to the destination to finish the way by foot" (Calabrese, Kloeckl and Ratti, 2009, p. 398-399).
Sense	"It is with our senses we come to know our environment, perceiving and observing it" (Welter, 2002, p. 38). Senses act as the cognitive framework to understand the place or the environment. Lynch uses this framework to elicit the "legibility of cityscape [–] the ease with which its parts can be recognized and can be organized into a coherent pattern. […] Structuring and identifying the environment is a vital ability among all mobile animals. Many kinds of cues are used: the visual sensations of color, shape, motion […] as well as other senses such as smell, sound [and] touch" (Lynch, 1960, p. 2-3). In the context of Urban Informatics, legibility could be seen as the level of ease in way-finding around a city. This is not simply about finding directions from place A to B; it can also be understood in combination with the sensorial expectations out of the route. For example, locating a route from place A to B with minimum noise pollution or a green route that has lowest levels of air pollution or the route with the most distinct view of city lights.
sensed-Experience	This category is concerned with how the sensorial cues of the environment influence activities. The visual cues in front of every shop, the smell of freshly baked bread outside a bakery, the garbage containers on the road-side, each of these are an invitation for an activity. Another commonplace example of sensed-Experience is the market of billboard advertising. In the context of Urban Informatics, the Urban Screen is an example of ideas that fall under this category. Urban screen is a "large, programmable, outdoor electronic billboards displaying media for commercial and advertising purposes, often affixed to buildings or other prominent urban structures" (Shepard, 2009, p. 449). It could also refer to the visual or gestural cues on the user-interface of an application and how the information is read. Other example could be location based advertisement based on the time of the day, e.g., providing information about closest restaurants at lunch time.
sensed-Feeling	This category primarily deals with the feelings that an object in an environment can generate within an observer. Lynch elicits this idea in what he defines as "imageability: that quality in a physical object which gives it a high probability of evoking a strong image in any given observer. It is that shape, color, or arrangement which facilitates the making of vividly identified, powerfully

structured, highly useful mental images of the environment" (Lynch, 1960, p. 9). Geddes advocated a camera obscura at the roof-terrace of his Outlook Tower concept for the same reason. The Outlook Tower was envisioned as unique public institution that showcases in the increasing expanse of the visitor's world from the city, to the country, to the continent and ultimately to the world as s/he climbs down the tower. The camera obscura was installed to enable looking at the city from the roof-terrace to capture the image of the city (Welter, 2002, p. 78).

In the context of Urban Informatics, an installation that showcases a hybrid map of the city "on a big screen in a major square […] of real-time population distribution by the use of cell-phone data, the location of buses and trains, real-time newsfeeds […] and its mapping to certain events happening in a city" (Calabrese, Kloeckl and Ratti, 2009, p. 394) is an example of how a complete city can come alive in the mind of an observer with its inherent complexity of movements and events.

Figure 3 compares the Facts blocks of the original *Notation of Life* diagram with the ones adapted to the Urban Informatics context.

feeling Sense	feeling Experience	Feeling
Home	Mastery	Folk certifications
experienced Sense	Experience	experienced Feeling
Knowledge about spaces	Activities, Thick Description	Folk-ways
Sense	sensed Experience	sensed Feeling
Legibility	Sensorial cues of the environment	Imageability

Facts | Schools | Original

feeling Sense	feeling Experience	Feeling
Place-based Blogging	*Fláneur*	Skeuomophs New function – Old devices
experienced Sense	Experience	experienced Feeling
Locating events and experiences, viz., Sightseeing	Urbanism and Information Mediation	Enabling every day rituals, viz., commuting
Sense	sensed Experience	sensed Feeling
Way-finding	Urban Screen Location-based Advertisement	Representing movements and happenings of a city

Facts | Schools | Adapted

Figure 3: Comparison of blocks of Facts

Thoughts (Dreams) | Cloisters

Geddes classified generalized impressions that a place provides into the world of Facts. He believed that the subsequent individual responses of citizens to these impressions belonged to a "deeper psychology" (Geddes, 1924, p. 196) which he classified into Thoughts (Dreams). "Geddes [assumed] a continuous production of Schools [of Thought], some of which would develop into leading centers of thought and engage in a 'Synthesis of a new kind'. Geddes [located] these particular Schools in places he called 'Cloisters of contemplation, meditation, imagination'" (Welter, 2002, p. 36). "For individuals, dreams are equivalent level to the Cloister. […] The Cloister initiates 'collective action' by the inhabitants of a Town, which is, however, based on individual endeavors, that is the dreams, of the former" (Welter, 2002, p. 42). An intervention to be designed for a place needs participation and Thoughts (Dreams) form the space where this participation becomes a possibility. In this sense, Thoughts (Dreams) define the methods for intervention. Table 3 will capture the nine blocks that define Thoughts (Dreams).

Table 3: *Notation of Life* | Thoughts (Dreams)

Emotion	"Our primary (i.e., objectively acquired) feelings become transformed and individualized to us as Emotions" (Geddes, 1910, p. 9). Emotions create connections. The emotional state of the individual forms the basis with which s/he interacts and participates in an environment. Emotions can drive the creation of communities. This is also the third step in the progression of folk. In the context of Urban Informatics, social networking thrives on connecting people with similar interests. For example, the 'Causes' application on Facebook that has a range of communities based on causes that range from Animals, Arts & Culture, Education to Environment, Religion and Public Advocacy. A classic example specifically designed as an Urban Informatics application is "City Flocks – a mobile information service for public urban spaces. The system is managed by local urban residents and is designed to tap into their tacit social knowledge. City Flocks allows participants to operate their mobile phones or computers to leave and access virtual recommendations about community facilities, making them easily accessible for other people employing user-generated tags" (Klaebe et al., 2009, p. 188).
emotioned-Ideation	Geddes uses the example of "philosophy" in the category of emotioned-Ideation. The implications of his idea should be seen in the essence of philosophy. Philosophy as a discipline essentially thrives on the art of questioning. To be able respond to those questions forms the foundation of philosophical texts. For a citizen undergoing a transformation from a passive observer to an active participant, emotioned-Ideation is a site for reflection. When s/he starts questioning the way a city functions and how it could be improved, the process of transformation is initiated.

	In the context of Urban Informatics, this would imply "taking [an] editorial approach to the public sphere" (Castiglione, 2009) in the words of Martijn de Waal. It is about questioning the environment that one lives in and finding responses to them. Textales could be seen as a possible example. "In Textales members of urban and rural communities took photographs addressing housing inequities, anti-smoking legislation and political influences on daily life. They selected and arranged images for large-scale projection in public arenas. Passersby could then use mobile phones to augment the displays by sending text messages that appeared as captions" (Castiglione, 2009).
emotioned-Imagery	Emotions when super-imposed on places create impressions of the place in the mind. For example, a cathedral usually gives an impression of a peaceful and awe-inspiring space or a café which happens to be a regular meeting point for a group lends a sense of familiarity and comfort. Places can be identified with individual emotions that they represent for individual people. Geddes uses the example of poetry to explain this category. In the context of Urban Informatics, a possible thought experiment along these lines would be to map places with their "Mood Quotients" – an aggregated count of what emotions a place generates synonymous to 'Like' in Facebook or Digg. A Mood Walk through the city would be to visit places that inspire a particular emotion borrowing from the user-generated emotional impressions of places.
Ideation	"Our experience becomes clarified from ordinary intelligence to rational Ideas" (Geddes, 1910, p. 9). Experience of activities leads to intrinsic knowledge about workflows of the activity. The workflow lends itself into needs that are new opportunities for improvement. If one starts conscientiously thinking about these needs, one has reached the stage of Ideation from Experience. Geddes notes "Science" as an activity to be an example of this category. The underlying assumption that Geddes operated on was that Science is the method that humans use to make sense of their environment. In the context of Urban Informatics, the design of applications needs playful encounters. Within the framework of the theory of social construction of technology (Pinch and Bijker, 1984), one can understand that the development of technology is not a linear progression. It has its own set of failures and successes. Rational thinking needs play to reach rationality. Every design has to engage enough people to understand its pitfalls. Every urban informatics application is a site for Urban Play – "a project created for the city of Amsterdam […] which explores open approaches to design and creativity in the city. From September to December 2008, the IJ waterfront area of Amsterdam was transformed into a creative playground where people could interact, alter and rework a series of design installations. To use a software analogy, the designs

	were installed in version 1.0, and it was up to the public to develop them into version 2 through individual and collective creative intervention" (Scott Burnham – Projects, 2010).
ideated-Emotion	In marketing terms, every supply operates on the dynamics of demand. The category of ideated-Emotion focuses on the demand aspect for rational thoughts – the reasons for certain behavior, the assumption behind product development. Ideation operates on the underlying assumptions on user-behavior, for example, Urban Play operates on the assumption that given the space and the opportunity citizens will explore the possibilities within design installations to create new products. Geddes gave "Doctrine" – a codification of shared beliefs – as an example of ideated Emotion. In the context of Urban Informatics, the division of users into profiles and archetypes is fundamentally a method to codify their shared needs and expectations. A few of these assumptions seem to be universal in the context of the application, for example, the assumption behind Textales is that citizens would eventually like to play an active role in urban development which forms the basic building block upon which the entire application is developed.
ideated-Imagery	Geddes believed that bringing in the construct of imagination to rational ideas leads to "Design" – an exemplar for ideated-Imagery. Tim Brown defines Design Thinking – "as a methodology that imbues the full spectrum of innovation activities with a human-centered design ethos. By this I mean that innovation is powered by a thorough understanding, through direct observation, of what people want and need in their lives and what they like or dislike about the way particular products are made, packaged, marketed, sold, and supported" (Brown, 2008). Geddesian conception of City Design worked on the same principle of a sharp focus on citizens that inhabit the city. While the city develops in a combination of individual agendas of the local government, private builders and a multiplicity of other organizations, an Urban Informatics application is citizen-centric. It is about how individual users would interact with a system and make use of it. In that sense, development of an Urban Informatics application requires an element of design thinking.
Imagery	"Our sense impressions not only fade or revive in memory, but rearrange as personal Images" (Geddes, 1910, p. 9). In the words of Lynch, "there seems to be a public image of any given city which is the overlap of many individual images. Or perhaps there is a series of public images, each held by some significant number of citizens. Such group images are necessary if an individual is to operate successfully within his environment and cooperate with his fellows. […Among the factors that influence this public image, there are] physical, perceptible objects in the city along with] the social meaning of an area, its function, its history, or even its name" (Lynch, 1960, p. 46). Geddes used "Imagination" as an example to elicit imagery.

	In the context of Urban Informatics, this idea lends itself into an application with possibilities of value-additions. Facebook as a social network does not attract each of its users for the same reasons. While some use it to stay in touch with their friends, others use it to play the multiplicity of games that are available on its platform. A digital application that is useful but provides a single functionality would eventually be taken over by an application that serves the original purpose, but adds value to it. The whole idea of an open API for most of the recently developed mobile phones (iPhone, Android, etc.) is to encourage users to constructs their own meanings for their devices.
imaged-Emotion	Geddes identified imaged-Emotion with "Symbols". Whether it is the IAmsterdam or the Incredible India branding campaign, the idea is to look at a place and identify with its symbols. Some landmarks in Lynch terminology act as symbols of the city as well. For example, The Empire State Building in New York or the Eiffel Tower in Paris. In this sense, imaged-Emotion is the way by which citizens identify with their city. It could be colors, flags, landmarks, and favorite sport, anything that is used to symbolize the city. In a way, it defines the emotion embedded in an image. In the context of Urban Informatics, an application could successfully leverage these symbols to create a local identity. For example, a recent research in Information Design by David McCandless identifies the meaning of colors across 10 different cultures and 62 emotions (2009). Color is usually the first among the ways in which a design varies across cultures. Design with a sense of semiotics could inform the way in which an application is accepted in a community of citizens. The emotions that a particular application or product generates could be studied under the paradigm of imaged-Emotion. What is emotional association do people make with a particular application?
imaged-Ideation	Geddes used "Graphical Notation" for the world of mathematics as an example for imaged-Ideation. A graphical notation is important in mathematics because it carries an entire world of meaning with its connotation. For example, the notation of ∑ could mean standard deviation or a summation operator depending upon the context. In this sense, it defines the meaning embedded in an image. In the context of the city, landmarks carry meaning, for example, the Town Hall of a city denotes the administrative center. In the context of Urban Informatics, it denotes the idea of how applications start defining a certain activity. For example, to "Tweet" is to broadcast a message to one's subscribers about a status update. A technological idiom for people who use Twitter. Certain products end up defining a completely new lifestyle within their usage patterns. For example, automobiles and the cell phone. The impact of a particular application on its users could be studied under the paradigm of imaged-Ideation. What meanings do citizens associate with a certain application?

Figure 4 compares the Thoughts (Dreams) blocks of the original *Notation of Life* diagram with the ones adapted to the Urban Informatics context.

Emotion	emotioned Ideation	emotioned Imagery
Religion, Mysticism	Philosophy	Poesy
ideated Emotion	Ideation	ideated Imagery
Doctrine	Science	Design
imaged Emotion	imaged Ideation	Imagery
Symbol	Graphic Notations	Imagination
Thoughts | Cloisters | Original		

Emotion	emotioned Ideation	emotioned Imagery
Online Communities	Enabling discussions on the city	Mood Quotients
ideated Emotion	Ideation	ideated Imagery
Assumptions Codification of shared needs and expectations	Playful Encounters	Design Thinking
imaged Emotion	imaged Ideation	Imagery
Design with a sense of Semiotics	Lifestyle based on Usage Patterns of applications	Multi-functionality, Open-API
Thoughts | Cloisters | Adapted		

Figure 4: Comparison of blocks of Thoughts (Dreams)

Deeds | City

"The last quadrant, finally, is inscribed 'City in deed', which indicates the transformation of reality according to the ideas and ideals developed in the Cloister" (Welter, 2002, p. 37). This final step marks the culmination of the process as the result of the changes observed in the out-world. Deeds are also the ideals that Geddes believed to be the driving force of his *Notation of Life*. Deeds define the expected end-result. An intervention is always created with a certain end-result in mind. One always needs an answer to the question of why a particular intervention is required to start it. In this sense, Deeds define the ideals for intervention. Table 4 will capture the nine blocks that define Deeds.

Table 3: *Notation of Life* | Deeds

Etho-polity	"[The] ideas [of the inhabitants of a city], when realized, find expression in a 'new type of community… the essential bond being 'not according to the

	flesh, but to the spirit'. This new type of group thus needs a type-name; and as fundamentally of ethic bond, yet social purpose, let us call this an Etho-Polity" (Welter, 2002, p. 39). Geddes believed that the feeling of being involved into city development would eventually strengthen the bond between citizens as a city community and create a higher sense of shared beliefs. In the context of Urban Informatics, this idea is reflected within the term Participatory Urbanism. "Participatory urbanism promotes new styles and methods for individual citizens to become proactive in their involvement with their city, neighborhood, and urban self-reflexivity. One such example of Participatory Urbanism is the use of mobile phones to be transformed into environmental sensing platforms that support community action to effect positive societal change" (Paulos, Honicky and Hooker, 2009, p. 435).
etho-politicized Synergy	Geddes gave "Wisdom" as an example of etho-politicized synergy. In terms of information hierarchy, wisdom is the highest level of knowledge. It comes with an establishment of a syncretism of differences, with a balance between individual opinion and collectivized doctrines. He assumed that once citizens would become active participants, the nature of their participation would bring about a diversity of ideas around city-planning. Within the symbiotic combination of these diverse ideas lies the possibility of etho-politicized Synergy or wisdom in the agenda of city-planning. In the context of Urban Informatics, this refers to a combination of Personal Informatics and Public Authoring. A vetting system that combines these two to create efficient knowledge management systems about the city. Personal Informatics are "information services, often accessible via a mobile phone, that search, sort, mine, correlate or otherwise filter information for a person based on their preferences, transaction logs, location, social networks, and other personal data" (Shepard, 2009, p. 448-449). On the other hand, Public Authoring is an "open, public process of associating virtual media objects and other types of information to actual locations in the city, whereby people are enabled to construct and contribute to this information layer, rather than simply consuming pre-authored content" (Shepard, 2009, p. 449). Aggregated information on Personal Informatics applications creates a subtle notion of Public Authoring. The interaction between applications within these two disciplines can create the informational ecology of city life.
etho-politicized Achievement	Geddes used "Sacred Art" as an example of explain this category. The intersection of the highest level of public engagement and ideals, would lead to conscientious expression in art-forms. With the idea of "Sacred Art", Geddes implied the highest level of expression that can be achieved by humans. The reference is to the forms of expressions that citizens would develop once they are consciously exploring the city and how it would continuously evolve with communication between citizens as a community.

	In the context of Urban Informatics, this concept translates into Civic Smart Mobs – "a real-time gathering of individuals contacted through mobile technology for the purpose of conducting a civic activity" (Carroll and Ganoe, 2009, p. 352). This is the ultimate form of participation and expression that can be expected out of participatory urbanism.
Synergy	Synergy is an expression for working together. "People moving and acting in a city base their decisions on information that is, in most cases, not synchronized with their present time and place when making that decision. How often have you […] been surprised by a traffic jam? […] In the same way, a person acting in a city contributes himself to dynamics of which others are not aware when making their decisions. Looked upon this way, a city resembles what Deleuze and Guattari describe as a rhizome. The rhizome is a philosophical network structure where every part is necessarily connected with every other part of the system. There are no preferential connections because every connection alters the overall network structure. As a consequence, the rhizome cannot be plotted since the plotting action itself is a part of the rhizome and thus in the very moment of plotting its structure, the structure changes" (Calabrese, Kloeckl and Ratti, 2009, p. 391). While citizens may operate independent of each other, they still play a role in the lives of each other as a collective lending a rhizomic character to the city. Geddes used this idea to define this category and he used the example of history to explain it. The history of a place is redefined every time a citizen tells its story. It is in the collection of shared narratives that history finds its common ground. In the context of Urban Informatics, the appropriate example in the context of history would be the Sharing Stories history project whose "purpose was to collate the history of the [recently developed completely new urban] site, to give a reference point and a context to future residents, to capture 'history in the making' as the ethos of the development" (Klaebe et al., 2009, p. 185). The project used the idea of digital storytelling wherein "a combination of a personally narrated piece of writing (audio track), photographic images and sometimes music [… were] unified to produce a 2-3 minute autobiographical micro-documentary film" (Klaebe et al., 2009, p. 186) by each of the participants.
synergized Polity & Life	The work-Place transforms into synergized Polity & Life after flowing through the *Notation of Life*. Geddes gave 'Career' as an example for this category. A Career is an abstract notion of work that is independent of the place where one is employed. Despite the place of work being important to the ability with which one can follow a career, the idea of career itself does not entail the notion of place in it. A career as a notion encompasses the politics of livelihood and connects the nature of work across places.

	In the context of Urban Informatics, this can be understood by looking at the theory of Apparetgeist proposed by Katz and Aakhus (2002). They "explain the phenomenon of mobile use through the theory of the 'apparetgeist' which can be literally translated to mean 'machine spirit'. The apparetgeist suggests 'the spirit of the machine that influences both the designs of the technology as well as the initial and subsequent significance accorded by users, non-users, and anti-users'. For Katz and Aakhus, the theory of apparetgeist is embodied by the mobile phone – a device that is stronger than cultural or geographical differences and able to establish new, similar patterns of 'use', 'design' and 'anti-use' around the globe. In a similar vein, Langdon Winner (1999) argues that artifacts can and do have politics, thus highlighting the potential of the mobile phones to shape ideological practices" (Satchell, 2009, p. 362). One has to be aware that any Urban Informatics application can easily lend itself into a critique of the city and in turn, an ideological interpretation of the city. An information application is not simply innocent in this sense; it can be manipulated to put forward contextual political and cultural agendas.
synergized Achievement	Geddes defined the ultimate ideal for the category of work-Folk or 'Producers' in the Acts section as synergized Achievement. In this category, he would have explored how collaborative action by citizens could change the perception and experience of urban spaces. In the context of Urban Informatics, an ideal in this domain could be seen the concept of Collaborative Spatiality – "the perception, as well as the experience, of urban spaces is partly shaped by the collaborative activities within groups. For example, through car clubs BBS, people build a 'City-Wiki' including trip routes, cheap parking manuals and a GPS guidebook to share their mobility experience and knowledge" (Shang, Doulet and Keane, 2009, p. 388-398).
Achievement	Geddes believed that etho-polity and synergy would ultimately lead to the achievement of a city which exists in harmony within itself. With the imagination of a city as the highest form of human evolution, the ultimate aim of Geddes was to locate the harmonization of citizen and urban artifacts (streets, buildings, infrastructure services). Within that space, he believed would be the existence of the perfect human race. In this sense, Achievement defines the ultimate ideal of the *Notation of Life*. In the context of Urban Informatics, the ultimate ideal would be a WikiCity – "a real-time mapping of the city dynamics. This mapping, however, is not limited to representing the city, but instead becomes instantly an instrument upon which city inhabitants can base their actions and decisions in a better-informed manner. In this way the real-time map changes the city context, and this altered context changes the real-time map accordingly, with the ultimate

	aim of leading to an overall increased efficiency and sustainability in making use of the city environment" (Calabrese, Kloeckl and Ratti, 2009, p. 391).
achieved Polity & Life	The end of place-Folk is achieved Polity & Life in the *Notation of Life*. Geddes believed that in the subsequent era of conurbation – an aggregation or continuous network of urban communities – the idea of a 'Native' would lose its meaning. Hence, he identified achieved Polity & Life with Death and Tragedy. But, despite the achievement of the idea of a globalized citizen with the digital era, places still hold a unique influence over user-behavior. In the context of Urban Informatics, research on questions of immigration falls along these lines – "how can new media applications be used to engage the incoming population, so that the locale becomes their story and their emerging history?" (Klaebe et al., 2009, p. 187). "History Lines brings a cross-section of new residents together in an activity using narratives, digital maps and location markers pinpointing where they have lived during the course of their lives. Participants can map their life journey thus far by recording their personal narratives of place, while also narrating their relationship with past communities. When stories and locations are collated together, overlapping and common lines of location emerge" (Klaebe et al., 2009, p. 188).
achieved Synergy	The category of achieved Synergy is achieved with the successful transformation of place-Work. This category operates at the level of combinations between the natural advantages that a place offers and the way citizens perceive their lives in that place. Hence, Geddes classified 'Rhythm' from the world of music as an example of this category signifying cycles or recurring ideas. The place with the natural advantages that it offers, creates a space for recurrence of the idea of the use of these advantages in city development. For example, Maastricht continuously re-invents its historical buildings as a site for housing ideas of the present and the future. In the context of Urban Informatics, this implies continuity and recurrence of applications that make use of locative media. Locative media as a paradigm is not simply about geographical positioning, it embeds with the markers of geography the narratives of space, time, communities, history, politics, capitalism in the form of advertisements and a multiplicity of other equally viable discourses. All of these narratives operate in the rhythm of geographical markers and the stories they can tell.

Figure 5 compares the Facts blocks of the original *Notation of Life* diagram with the ones adapted to the Urban Informatics context.

Deeds | City | Original			Deeds | City | Adapted		
achieved Polity & Life	achieved Synergy	Achievement	achieved Polity & Life	achieved Synergy	Achievement
Death and Tragedy	Rhythm	Nature and Architecture	History Lines	Locative Media	Wikicity
synergised Polity & Life	Synergy	synergised Achievement	synergised Polity & Life	Synergy	synergised Achievement
Career	History as an exercise in collective re-membrance	Success	The theory of Apparetgeist	City as a 'Rhizome'	Collaborative Spatiality
Ethno-Polity	ethno-politised Synergy	ethno-politised Achievement	Ethno-Polity	ethno-politised Synergy	ethno-politised Achievement
Love	Wisdom	Sacred Art	Participatory Urbanism	Combination of Personal Informatics & Public Authoring	Civic Smart Mobs

Figure 5: Comparison of blocks of Deeds

Embedded connections

These categories cannot be looked at as individual guiding points. They inevitably inform each other and work with each other to create the flow of urban development or interventions in Urban Informatics. For example, place-Work cannot be differentiated from work-Place and treated as a stand-alone entity. They build upon each other. The connection in the *Notation of Life* are not just vertical, they are horizontal as well. Relooking at the *Notation of Life* in the context of Urban Informatics by combining the respective adapted parts, we arrive at Figure 6.

In this seemingly endless world of possibilities, one can understand that the *Notation of Life* not only acts as a work-book for ideas, it is also an open work. The work-book is a booklet containing problems with spaces for solving them, while open work can be understood as a conceptual framework – a thinking machine – that can be continuously interpreted with new lenses. Geddes wanted to capture the city in terms of evolution and psychology (Welter, 2002, p. 26-53), but in the process of creating this thinking machine, he also left a space for the future. A future that could create a world of interpretations and possibilities around his thinking machines. This appendix is simply an attempt to capture one such interpretation, one possibility that is definitely worth exploring.

Acts | Town			Deeds | City		
Place	place-Work	place-Folk	achieved Polity & Life	achieved Synergy	Achievement
Geocoding Media Content	Work inclinations & preferences of people	Localization	History Lines	Locative Media	Wikicity
work-Place	Work	work-Folk	synergised Polity & Life	Synergy	synergised Achievement
Representation systems & City Infrastructure	Creating Metaphors for Urban Dialogue	Causal role in Everyday activity	The theory of Apparetgeist	City as a 'Rhizome'	Collaborative Spatiality
folk-Place	folk-Work	Folk	Ethno-Polity	ethno-politised Synergy	ethno-politised Achievement
Geocoding collective memory	User Profiles / Archetypes	Understand needs (expressed or observed)	Participatory Urbanism	Combination of Personal Informatics & Public Authoring	Civic Smart Mobs
feeling Sense	feeling Experience	Feeling	Emotion	emotioned Ideation	emotioned Imagery
Place-based Blogging	*Fláneur*	Skeuomorphs New function – Old devices	Online Communities	Enabling discussions on the city	Mood Quotients
experienced Sense	Experience	experienced Feeling	ideated Emotion	Ideation	ideated Imagery
Locating events and experiences, viz., Sightseeing	Urbanism and Information Mediation	Enabling everyday rituals, viz., commuting	Assumptions Codification of shared needs and expectations	Playful Encounters	Design Thinking
Sense	sensed Experience	sensed Feeling	imaged Emotion	imaged Ideation	Imagery
Way-finding	Urban Screen Location-based Advertisement	Representing movements and happenings of a city	Design with a sense of Semiotics	Lifestyle based on Usage Patterns of applications	Multi-functionality, Open-API
Facts | Schools			**Thoughts (Dreams) | Cloister**		

Figure 6: The Urban Informatics Context in the *Notation of Life*

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