

# NVWN – the Nordic Virtual Worlds Network

## Final Report – Summary and Implications for Policymakers





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# Contents



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Contents	
<b>Executive summary</b> .....	<b>8</b>
<b>What is the 3D immersive Internet?</b> .....	<b>10</b>
<b>Why is investing in virtual worlds and the 3D immersive Internet Important?</b> .....	<b>16</b>
<b>What challenges is the Nordic industry facing?</b> .....	<b>20</b>
<b>What sort of support and initiatives are needed?</b> .....	<b>24</b>
<b>APPENDIX 1 – List of NVWN Participants</b> .....	<b>32</b>
<b>APPENDIX 2 – NVWN Online Resources</b> .....	<b>37</b>
<b>APPENDIX 3 – List of NVWN Reports and Executive Summaries</b> .....	<b>39</b>



# Executive summary

This report is based on NVWN - the Nordic Virtual Worlds Network, a two-year Nordic research project and network combining academics, practitioners, and entrepreneurs running from March 2010 to February 2012. The project investigated the opportunities and challenges that the emerging 3D immersive Internet and virtual worlds pose for entrepreneurship and innovation. During the two years, the project produced several reports on topics such as entrepreneurship, innovation, and the future of the virtual worlds and these can be found on our project website: <http://nordicworlds.net/project-findings/>. Appendix 3 also provides more information on these reports.

While we found that activities in-world or in online spaces take many forms and generally involve multiple organizations and individuals, there are a wide range of commercial and value creation processes underpinning these spaces and what happens within them. These processes involve firms of all sizes, innovation, and entrepreneurship, and policy can make a very considerable difference to the climate for successful firms and entrepreneurs.

Our project findings clearly indicate that policy is needed to support the 3D Immersive Internet based industry. This report is very narrowly focused on analyzing the policy implications of the emergence of an industry of firms and economic actors that depend upon the 3D Immersive Internet for their prosperity.

Nordic policies should be emphasized. The policies suggested here are explicitly Nordic in character and scope. While there are many measures that can be – and are – taken at national and local levels, we argue that there are significant synergies to be gained from coordinating policies across borders and that the Nordic arena is a natural candidate for such coordination and cooperation.

The Nordic region already offers significant examples of companies and actors working at the cutting-edge of virtual worlds and the Immersive Internet. However, there is a lack of Nordic regional cooperation and coordination. In order to fully leverage the clear potential that ICT heavy Nordic societies and economies have to be at the forefront of emerging forms of immersive internet and virtual worlds, an initial three-year strategy that details what actionable measures should be taken and how they will be financed

and evaluated should be developed. This strategy needs to start from the key challenges identified here and to develop concrete measures in the priority areas we have listed.

Selective suggestions. Finally, as the report is founded on research primarily conducted within the Nordic context, it is selective in its suggestions. Simply speaking, there is a range of policies that the report deliberately does not include.

- First, the report aims to suggest policies that supplement rather than replace existing policies. We do not wish to downplay existing beneficial framework conditions on the demand or supply side, such as ICT innovation policy and entrepreneurial schemes.
- Second, the economic approach to this emerging industry means that we focus on policies that aim to facilitate industry actors' own attempts to become more effective and competitive, i.e., on helping them to help themselves rather on top-down policy approaches.

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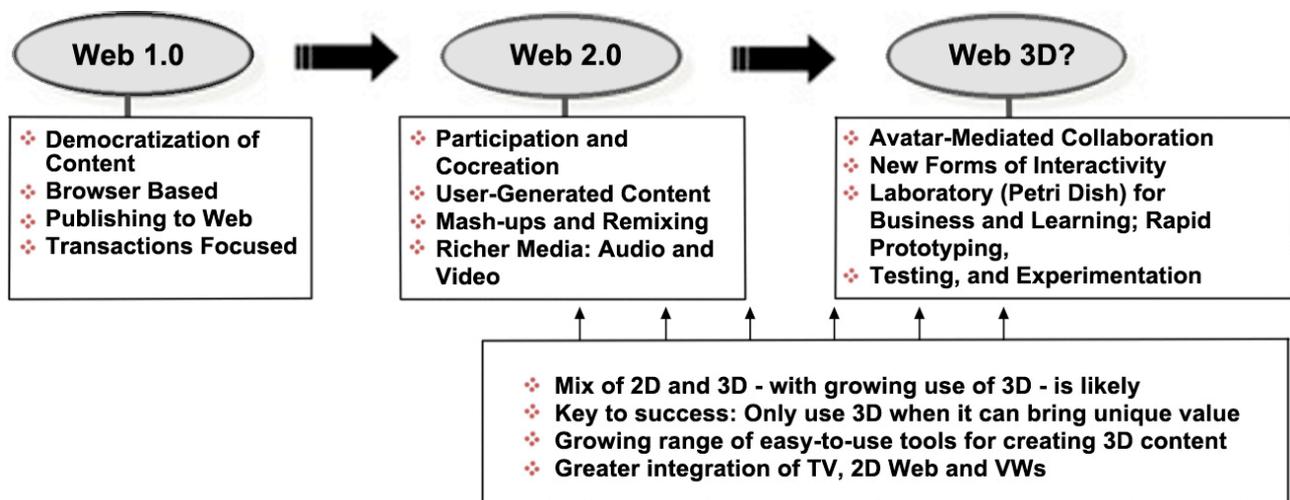
The result is that rather than a comprehensive catalogue of possible policies, the report suggests a careful selection of policies that, we hope, stand a good chance of working together successfully.

# What is the 3D immersive Internet?

In recent decades advances in computing and online communications and information technologies have created a paradigm shift in several areas of society. In the business world the digital revolution has required new ways of thinking in terms of business models and marketing. It has also opened up new opportunities for expansion into new export markets. It has created new ways of organizing work and new ways of communicating.

As this revolution evolves and penetrates potentially every aspect of social and business life, we are seeing the Internet in particular evolve rapidly into an ever more engrossing and immersive experience. In the near future, and indeed already today, online worlds and experiences that offer users increasingly realistic and engaging immersive experiences will develop. These online sites, spaces and worlds will likely use 3D techniques and deep immersive techniques to give users a much richer and deeper connection to the virtual. Interfaces such as avatars will help users plunge into virtual worlds (VWs) and new forms of control such as facial gesture recognition will allow users to manipulate data and interact in easier and more natural ways.

## Evolution of the Web Towards the Web 3D



Source: Strategic Business Insights

The evolution of new virtual worlds and spaces has brought its own nomenclature of terms to describe virtual environments that differ in some ways. Although we will continue to use the term virtual worlds in this report—as a generic term for 3D immersive environments - the following terms are also used in the extensive literature of VWs:

- *Massively Multiplayer Online Role-Playing Games (MMORPGs)* but also simplified as Massively Multiplayer Online Games (MMOGs) or even MMOs—This would include many very successful games like World of Warcraft, Everquest, Entropia Universe, EveOnline and others that have millions of users worldwide and bring in billions of dollars in revenues each year.
- *Mirror Worlds*—This describes a literal representation of the real world in digital form. According to the Metaverse Roadmap report<sup>1</sup>, “It attempts to map (or mirror) real-world structures, like geography, or the stock market, in 2D or 3D form. Geographic Information Systems (GIS) are often 2D mirror worlds. Google Earth is an example of a 3D mirror world.”
- *Augmented/Mixed Reality*— According to the Metaverse Roadmap report, this refers to a “hybrid structure in which virtual elements are overlaid on our visual/audio/haptic sense of the physical world to augment information flow. Most typically, still or moving images are overlaid over a live background on a see-through display and matched to our dynamic point of view.” A growing number of commercial augmented reality products are now coming into the marketplace, taking advantage of the computing power and high quality displays of the iPhone and other smart phones.
- *Metaverse*— In Neal Stephenson’s seminal novel exploring virtual worlds, Snow Crash, he suggests that in the Metaverse humans, as avatars, interact with each other and software agents, in a three-dimensional space that uses the metaphor of the real world. This fictional idea is commonly used to describe where the immersive Internet may ultimately aim.

Though VWs exist in different forms, research<sup>2</sup> suggests that they offer a new experience relative to Web2.0 across the following three dimensions:

- Immersion—Relationship between self and the environment
- Absorption—Relationship between myself and the task
- Awareness—Awareness of others in this space with me

<sup>1</sup> The Metaverse Roadmap workshop took place at SRI International in May 2006 to understand the “pathways to the 3D web”.

<sup>2</sup> Douglas, Y. and A. Hargadon. The pleasure principle: Immersion, engagement, flow, Proceedings of the eleventh ACM on on hypertext and hypermedia, San Antonio, Texas, United States, (2000), pp. 153 – 160.



While the emergence of 3D immersive internet environments will have many impacts beyond the purely economic, this report does take an economic standpoint. The measures it suggests are about how the increased Nordic coordination of policies, and ultimately of the emerging industry itself, may enhance the economic effects of the industry in the longer term.

Of note is that there are already significant examples of Nordic companies and actors working at the cutting-edge of virtual worlds and the Immersive Internet:

- The Nordic region has continuously been at the forefront, particularly in the social gaming industry.
- Many of the most popular teenage and young adults online hangouts have been a result of Nordic know-how.
- The Nordic region hosts a considerable number of entrepreneurs leveraging Immersive Internet technologies for their real world activities such as within the film industry as well as avapreneurs, i.e. individuals conducting their entrepreneurial activities completely inworld, such as within the fashion industry.
- Key commercial examples include those firms with products and services directly related to immersive environments such as Stardoll, StarStable, Interactive City (IC You), and Entropia Universe (MindArk) in Sweden; Habbo (Sulake) in Finland; Stormfjord in Norway; and Eve Online (CCP Games) in Iceland, as well as examples tangentially related to immersive environments: Rovio in Finland, Minecraft in Sweden, and Funcom in Norway. There are also several examples of companies started by Nordic expats in the USA working with immersive environments such as The Grönstedt Group (Sweden), Unity 3D (Denmark), and Katalabs (Denmark).
- The education sector in the Nordic region seems to be well represented in virtual worlds. Several universities are offering courses via Second Life either on their own islands or via their partners' organizations islands (<http://nordicworlds.net/2011/10/31/discussion-of-vw-collaboration-possibilities-among-nordic-higher-education-institutions/>.)

Such examples should alert us all to the possibilities that already exist in the Nordic region to create a world-class regional climate for firms and entrepreneurs engaged in building and taking part in the evolution of the immersive internet.

### Examples of Firms in the Immersive Internet in or from the Nordic Region



### Some Statistics on Virtual Worlds

- The number of virtual worlds has grown from just a few in 2005 to more than 800 in 2012.
- The number of virtual world accounts has skyrocketed from 414 million in Q1 2009 to 1.8 billion in Q4 2011. Of the total, 10-15 year olds hold 44% or 787 million accounts.
- Virtual world revenues have increased from USD few hundred million in 2007 to USD 4 bln in 2011 and are projected to further increase to USD 9 bln in 2013.
- Revenues from the sale of virtual goods from virtual worlds, social networking sites, and cross-world activities has grown from around USD 0.5 million in 2007 to USD 9 bln in 2009 and is projected to grow to USD 14 bln in 2012.
- While the average virtual good costs only a few USD dollars, the most expensive item ever sold is a virtual asteroid for USD 635,000 in the virtual world of Entropia Universe.
- Entropia Universe has an annual GDP of more than USD 440 mln, larger than that of several nation states.

Source: Kzero.com and NVWN Project

### Virtual Goods and Virtual World Revenues Reaching New Levels

US\$ 635,000 for a virtual asteroid!



- US\$ 500,000 profit in 5 years by Jon "Neverdie" Jacobs
- Entropia Universe with GDP > US\$ 440 mln



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<http://www.forbes.com/sites/oliverchiang/2010/11/13/meet-the-man-who-just-made-a-cool-half-million-from-the-sale-of-virtual-property/>

# Why is investing in virtual worlds and the 3D immersive Internet Important?

New consumer behavior that favors immersion, interactivity and online connections makes it possible for Nordic firms and actors to reach exotic corners of the earth (and other worlds) as well as forge deep relations with potential consumers wherever they may be.

- Our work has described some of the organizations (e.g., Sulake, Eve Online, Stardoll, MindArk, etc. and applications (e.g., creative industry, entertainment) in the Nordic region and these examples show what is possible. (See the Entrepreneurship and Innovation reports we have written on these issues).
- The Nordic countries have world-class players in the gaming industry as well as in the mobile industry, and combined with emerging and best practices in the creative industry, these sectors are leading the way in demonstrating what is possible.
- The Nordic region is also strong in its understanding and support of open source, and this could be an area where the region could continue to play a leading role.

Investing in this area and in existing and emerging successes may help the Nordic region find the following:

## *A source of growth, revenue, and jobs*

- The Nordic region is well known as an important developer of mobile and other technologies, and the region cannot afford to not participate in a key area of future Internet development, namely the 3D Web (3D is seeing growing application in movies/entertainment, TV, 3D printing, and other areas and the Internet will surely follow).

- Investing in this industry and building the reputation of the Nordic region as a leader will attract talent, financial resources, and companies to the Nordic region.

*A new set of distribution channels and ways of connecting to global consumers*

- As more and more people spend time in virtual worlds, gaming worlds or immersive internet settings, it is important that Nordic firms know how and 'where' to connect with consumers.
- The dynamics of virtual worlds are increasingly being applied to real life situations to drive competitiveness. Game mechanics (incentives, rewards, score boards) are employed by marketers to drive customer engagement in an evermore hybrid environment.
- Virtual worlds will provide entrepreneurs a 3D Internet environment for training purposes, connecting with other entrepreneurs/business angels and talent, and gathering feedback and knowledge.

*A source of innovation - user innovation, co-creation, immersing users in an innovation process*

- Next practices in innovation suggest a shift of focus away from products and service innovation towards experience environments supported by a network of companies and consumer communities: networks and communities where users are increasingly co-creators and active innovators. Co-creation is an important aspect of how activities and interactions work on the Internet and in virtual worlds.
- Virtual world platform providers manage their co-creation activities extraordinarily well. With the emerging trend of open innovation, organizations struggle to incorporate user input. Real world online initiatives can benefit from VW expertise in managing online creativity and innovation.
- Nordic firms have the opportunity to leverage their strengths—in mobile games, for instance—into VWs in the future, and come up with innovative applications in this and other areas, and showcase Nordic innovativeness.

### Co-creation Workshop in Second Life with Participants from across the Globe



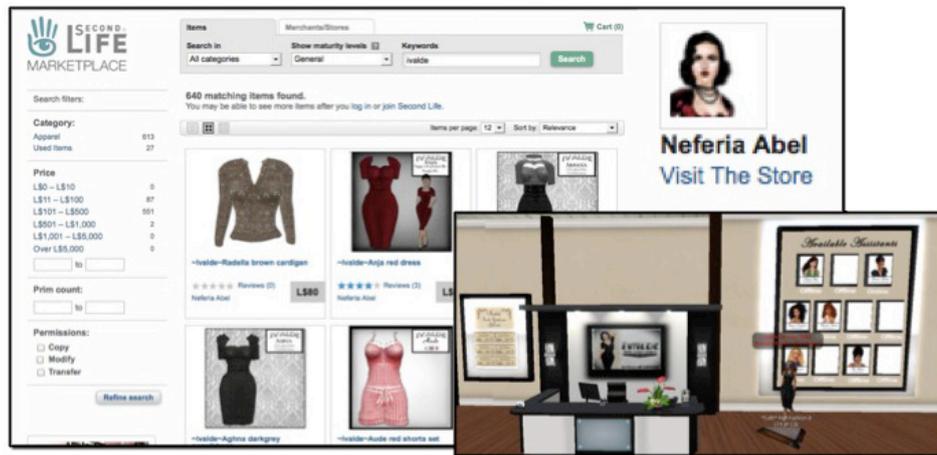
#### *A source of knowledge and learning platforms*

- Nordic organizations and individuals need to gain awareness and understanding of virtual worlds so they can take advantage of future developments on this front, especially for education and learning applications.
- The development of the 3D industry and virtual world platforms is increasingly central to communication, learning, entertainment and business opportunities. For example, the Immersive Internet gives rise to new types of learning spaces for educators and future students. Online seminars and expert meetings can be run both in live and virtual settings.

#### *New spaces for social and political change*

- Events in recent times have shown the power of networked individuals to connect and organize for radical protest, change and democratization. Nordic citizens can use these evolving technologies and spaces as powerful spaces for new and inclusive political and social connections. Investment in immersive forms of online interaction is important for Nordic citizens and society.
- As Internet connections improve even in the far corners of the Nordic region and more economic activity goes online and into virtual worlds, the pressure of population growth on cities may be relieved. Individuals will be able to live and work anywhere while still being able to connect with employers, employees, suppliers, consumers, etc. located around the globe.

## Entrepreneur Neferia Abel Lives in a Rural Area but Works Globally through Second Life



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*"Clearly, if social activity migrates to synthetic worlds, economic activity will go there as well." - Castronova, 2006*

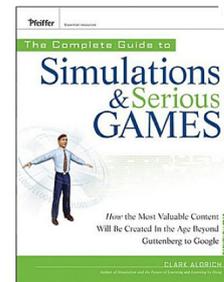
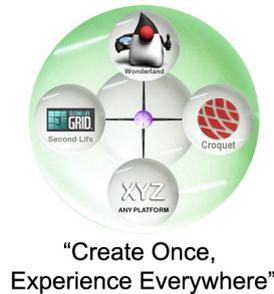
# What challenges is the Nordic industry facing?

During this two-year project, we conducted extensive research into the business and technological climate affecting entrepreneurship and competitiveness in virtual worlds. We identified the following six challenges as important issues that the emerging industry faces. These challenges can help guide research and concrete policymaking as challenges can always be turned into opportunities.

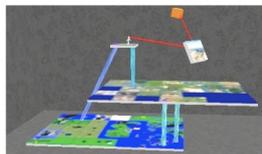
*Challenge 1: There is a high degree of rapidly developing technological uncertainty.*

- While there is considerable potential for virtual worlds, we should also consider the limitations and challenges that entrepreneurs face in relation to the emerging 3D Internet. These include legal issues such as intellectual property (IP) and financial regulations, a steep learning curve for deploying new technologies, a lack of common design elements, difficulties of cross-cultural communication (offline as well as online), and instability of new technologies.
- The technology is rapidly developing and technology foresight is difficult. With rapidly changing platforms and technology, entrepreneurs operating within virtual worlds are vulnerable to technology change and transformation driven by virtual world owners and platform providers.
- We should ask where the Nordic VW industry is and offer a critique of VWs: How is it fun and for whom? How can it be profitable and for whom? What sort of business models can be developed and what are the pros and cons of open source vs. “closed”/proprietary technologies?

## Increasing Pace of Virtual World and Immersive Internet Development



Expanding  
uses



Seamlessness  
between VWs



Browser-based VWs/  
hyperlinked 3D

### *Challenge 2: The institutional and regulatory environment is unclear and unformed.*

- Although commercial VW technologies are advancing rapidly, difficult proprietary issues concerning copyright and IP accompany this growth. Therefore, efforts to use open-source VW software are growing considerably. The questions of IP and open-source in our age of social media and media convergence present challenges for creating business models for short and long-term value creation for entrepreneurs. For instance, in our study on entrepreneurship, we learned that filmmaker Hanna Sköld has had to also become a fundraiser and has had to fit her Granny's Dancing on the Table cross-media project into traditional media categories. In order to overcome these challenges, entrepreneurs such as Sköld, have to develop substantial involvement in local, national and international networks, and are exploring new solutions to commercializing their products and services.
- There is a lack of clarity and standards and numerous different financial regulations exist with taxation policies affecting operations both in-world and at a firm level. The regulatory environment is particularly difficult in-world where some worlds that have closed economies may be opened and vice versa.
- Important questions that need to be addressed include the following: Where is the legal purchase made? Where are intellectual property rights secured and protected? How do we deal with new non-territorial spaces with distributed servers and code?

*Challenge 3: Investment environment in the Nordic countries underdeveloped.*

- The Nordic investor community has so far shown little interest in VWs and funding risky ventures in the VW industry is problematic.
- The Nordic industry in general has so far been slow and reluctant to adopt and test VWs. Some large players, such as Statoil have “put their toes into the water” and others such as Nokia have been doing a variety of things related to virtual reality and augmented reality, but most large Nordic players have not (yet) dived in.
- Although some schools and universities have started experimenting and using VWs, these initiatives are also relatively small, have relatively little funding, and are not coordinated such that knowledge sharing among them occurs.
- (Research) funding agencies in the Nordic region have so far in general provided little support for research into virtual worlds. Denmark and Finland are somewhat of an exception.
- Especially in the United States, the federal government has taken a strong interest in VWs and is testing various technologies and applications (especially in learning and training); such support and investment is still missing in the Nordic region.

*Challenge 4: The firm structure of the Nordic industry is vulnerable.*

- The firm structure of the industry is highly fragmented where the vast majority of the firms are relatively small. As a result firms may lack the resources to grow and reach new markets or platforms/worlds.
- There is also generally a low level of networking and knowledge and resource sharing among related firms. These structural characteristics make the industries poorly equipped for competing on global markets. In order to be competitive in the future, more complex “packages” are needed, and small firms cannot deliver them alone. If this structure is not changed, the expanding markets for more complex offerings will be taken by larger (non-Nordic) firms that can command the resources needed or by networks of smaller firms in flexible collaborations.

*Challenge 5: The Nordic actors have a poorly defined and organized institutional setup.*

- There is no clear vision of what the field encompasses. It is an ‘industry’ populated by multiple professions trained in different schools, dominated by very autonomous managers, and is a structurally disintegrated and fragmented set of often very small firms with few connections to each other. In contrast to many other industries, it is one that is young, poorly organized and networked at the level of trade associations,

industry organizations, lobby groups, etc. There is a lack of coherent professional or industry representative bodies and political lobbying. This makes linking policy and industry difficult. This lack of clear institutional structures also makes it difficult for firms to easily access information and support as well as to understand the true extent of their field of industrial activity. There is a huge challenge for the emerging industry to coordinate institutions in order to increase the effectiveness of their voice (helping policymakers understand their needs) and to help the industry construct shared resources and identities.

*Challenge 6: The Nordic region suffers a limited supply of necessary human capital.*

- One of the biggest challenges in the Nordic region, as was pointed out by Christian Björkman of MindArk, is access to talented human capital in the region. Many of the most talented people get offered work elsewhere or are prone to employ themselves abroad.
- The educational system to date has not kept pace with the human capital demands from this industry.

## What sort of support and initiatives are needed?

*"the Nordic Region faces fierce competition from growing overseas markets. This is competition that requires a pan-Nordic response."*

*(- Creative Economy Green Paper 2008, p. 10)*

There are many reasons for thinking that a coordinated Nordic approach is an excellent complement to national initiatives. Not least of these is that there already exists a high level of integration and coordination between the countries. Nordic countries share many institutional and cultural links and similarities. Within the Internet industry, interpersonal and firm links are relatively commonplace as are the experiences of working in other Nordic countries. The Nordic region represents a market of around 25 million highly tech-savvy consumers. Concerted Nordic action could build upon and create new links across the region in a number of areas. The goal of such work would, of course, be to use common backgrounds to develop effective policies directed towards increasing the competitiveness of Nordic firms in this priority area. There are many areas in which coordinated Nordic action could aid scale and scope. A far from exhaustive list could include the following:

- Raising awareness of the potential of a virtual world industry
- Linking firms across the region and globally
- Development of common infrastructure and linking of existing institutions
- Labor and skills training and development
- Technology and R&D investments (basic and applied)
- Innovation and information dissemination
- Access to venture and start-up capital

Concrete policies can focus on taking advantage of scale and scope. Taking advantage of scale is about recognizing that by combining and coordinating resources and activities we can gain from similarities. Taking advantage of scope is all about recognizing and

harnessing the differences between the Nordic countries. Looking for scope might involve seeing that in different places different skills and strengths emerge and exist, and that by linking these synergies can emerge.

We have identified six priority areas where action can be taken to support Nordic firms and innovation.

*1. Address technological uncertainty by being part of global networks and building global brands.*

- Our project research has highlighted the need for social networks as they are extremely important for the acquisition of knowledge and other resources, such as human capital, reputation, access to networks, and customers, and are necessary for value creation by entrepreneurs. Nordic cooperation networks need strategic development in order to provide agile platforms for innovation and growth in the industry. Thus, there is a need for a Nordic network to help actors gain knowledge about funding strategies, technical and open source know-how, legal advice on IP, and cooperation with business partners about the distribution of their goods and services.
- The Nordic approach of collaboration networking and openness should be emphasized as a strength and should be used to attract investors, entrepreneurs, and researchers who want to learn about the Nordic 3D Internet market and activities. Again, stressing the importance of the VCEI-Virtual Center for Entrepreneurship and Innovation developed by this project, the community should aim to become the preferred source of information about the VW industry in the Nordic region.
- There is a need for contact information databases with an overview of all the businesses/initiatives being active in the Nordic region.
- Export competitiveness relies heavily on a regional industry's network reputation and capacity. International networks can ease direct exports and sales.
- Trade fairs, conventions, festivals and showcases are key forums for networking, launching new products and meeting buyers, distributors and potential partners. Coordinated representation and strategic support at industry trade fairs is an effective way of networking with global firms. Trade fairs are an important conduit to achieving export business and improving market share.
- Pan Nordic branding in both emerging and established markets is essential. Bringing Nordic players together could encourage strategic alliances and information and knowledge sharing and help each in their more global expansion, which would also help in the building of a "Nordic VW brand", perhaps again focused on creative industries as an application area.

- Collaboration across the Nordic region could provide major benefits. A Nordic Conference that brings together players from both the supply and demand side could be a great way to kick things off and then be followed up with monthly or quarterly meetings at our Virtual Center for Entrepreneurship and Innovation.
- Networking is not just sales-oriented. Networking is central to firms' abilities to source new partners and new knowledge. The nature of this evolving technology and usage area is that new combinations, alliances, and technology transfers are absolutely necessary: novelty and speed of change are essential in order to keep up with consumer tastes.
- Much of this work can be best done online or in-world through creating virtual places – such as the VCEI in Second Life created for this project – where on-going events and activities help build awareness and branding for Nordic players.
- Entrepreneurs are dependent upon developing virtual collaboration skills involving the distributed management of complex, global projects and project members across multiple media platforms. The entrepreneurs utilizing VWs are inter-disciplinary, multi-cultural, and they have to negotiate complex economic issues.

#### The VCEI - Virtual Center for Entrepreneurship and Innovation Developed by NVWN



#### 96 seat Auditorium

##### Oval workspace

- Discussion group
- Presentation
- Collaborative workspace
- Open space



##### Circle workspace

- Discussion group layout
- Office layout
- Blank layout

*2. Improve the institutional and regulatory environment by coordinating digital strategy/regulatory issues and enabling structures.*

- A coordinated digital strategy to address regulatory issues and enabling structures is needed. But this must be based on research into key question areas: Are there technological and infrastructural issues that hamper development in the Nordic region or in certain places? Are governments' digital strategies and law making helping or hindering VW entrepreneurship?
- We are suggesting developing a self-sustainable community that can support entrepreneurs when they are exploring options for their business/initiatives via the Immersive Internet. Specifically, we are suggesting involving universities, high schools, colleges, trade organizations, student unions, entrepreneurs, etc. to take an active part in such a community.
- There is a need for entrepreneurs to learn about the basic logic of virtual environments and such a community of experts and practitioners could ease the gap of entering virtual environments. For instance, entrepreneurs need answers to questions concerning funding, market intelligence, and legal advices. Furthermore, there should be contact persons for different industries and topics.
- Although commercial VW technologies are advancing rapidly, difficult proprietary issues concerning copyright and IP accompany this growth. Therefore, efforts to use open-source VW software are growing considerably. The questions of IP and open-source in our age of social media and media convergence present challenges for creating business models for short and long-term value creation for entrepreneurs.
- There is a lack clarity and standards and there are different financial regulations, taxation policies that affect operations both in-world and at a firm level. The regulatory environment is particularly difficult in-world where some worlds that have closed economies may be opened and vice versa. Important questions that need to be addressed are: Where is the legal purchase made? Where are intellectual property rights secured and protected? How do we deal with in-world theft? How do we deal with new non-territorial spaces with distributed servers and code?
- The Nordic region could take the lead here, since so far no other region of the world has "stepped up to the plate" on this, and it is important since VW activities and digital currencies extend far beyond national boundaries.

*3. Improve the investment environment in the Nordic countries.*

- In order to be competitive at a global level the Nordic region requires increased international exchange and linkages to the global market. To do this it is necessary to attract foreign investment and foreign expertise. Investments, funding and venture

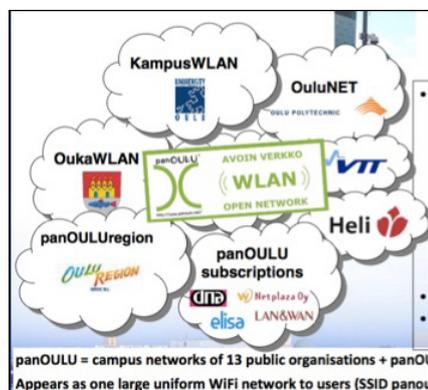
capital are needed to build strong companies able to support product development, find new markets and be competitive on a global/virtual market. Inward investment is not just about foreign expertise contained in venture capital and foreign firms; it is also about attracting new talent and people. People with backgrounds from outside the region bring with them valuable new insights, deeper understandings of foreign markets and through their professional networks help connect the Nordic field with other markets.

- Nordic players should pursue EU funding agencies and gain participation in VW projects they fund. For example, the Ministries of Defense in each of the Nordic country could seek involvement in cutting edge NATO or US Department of Defense projects that may involve VWs.
- For entrepreneurs to enter virtual environments, funding institutions and public offices will need to be educated about the opportunities and should know how to provide sufficient answers. They should also consider establishing a presence in important virtual worlds.

#### *4. Support entrepreneurship and SME development.*

- Support involves providing core services and information that those involved in Nordic VWs need. Core support is about providing collective resources and information so that firms and entrepreneurs can quickly adapt to new markets and concentrate on generating revenue. The networks and website built for this project are an example of this and can be important resources for firms and authorities looking for information and resources.
- Help entrepreneurs and firms avoid unnecessary learning curves by providing export market intelligence packages. Detailed market information can direct firms to which markets are most promising and identify areas to prioritize. Export authorities and technology agencies can help with this, but they must remember that normal territorial focuses are less interesting than focusing on evolving platforms and domains: in the virtual world you do not export to countries so much as to online spaces.
- Facilitate the sourcing of expert assistance on market/platform specific rights issues, trade and taxation issues, logistics, and legal/contract issues.
- Support structures may already exist for start-up and growing businesses, but they seldom understand this business area. Alert and educate SME and entrepreneurial support agencies to the possibilities that business in this area can represent.
- Improve Internet infrastructure throughout the Nordic region in both cities and especially rural areas. The city of Oulu, Finland is an interesting example in which the city offers free wi-fi.

### Free Internet Anytime, Anywhere in Oulu, Finland



- 72 300 EUR 2010 expence
- 0,008% city's budget
- 0,52 EUR/citizen/year
- 0,04 EUR/citizen/month
- Used by > 20 000/month

### 5. Develop and retain human capital - Mentoring and education.

- Competitiveness and success depends on access to well-educated and competent professionals.
- Experience and research shows that business-mentoring programs can be an inexpensive and effective method for developing careers, networks, inter-organizational learning, and knowledge transfer.
- Given the relatively small size of each national industry and the potential that an integrated Nordic market represents, pan-Nordic mentoring schemes that pair people from different countries and business areas are a priority area for entrepreneurial and innovation capacity development. Of particular interest are mentoring programs directed at (a) linking established entrepreneurs with early stage entrepreneurs, and at (b) women-to-women mentoring.
- Education of professionals on a pan-Nordic level: specialist educational courses are not educationally or financially viable in many of the Nordic countries and would benefit from a pan-Nordic approach.
- Our VCEI tries to address this: in the virtual space. The VCEI should offer mentoring and education by competent professionals from educational institutions and from industry. This will strengthen the position of the VCEI as it would provide the necessary help to entrepreneurs.
- Consider creating a "Nordic Center of Excellence" that focuses on the use of VWs in one or two creative industries.
- The NVWN project should be the opening bell for other public institutions to get involved, and educational institutions and others in each of the Nordic countries should pursue ministries for education and research, innovation authorities, and research councils to boost their funding of various VW projects.

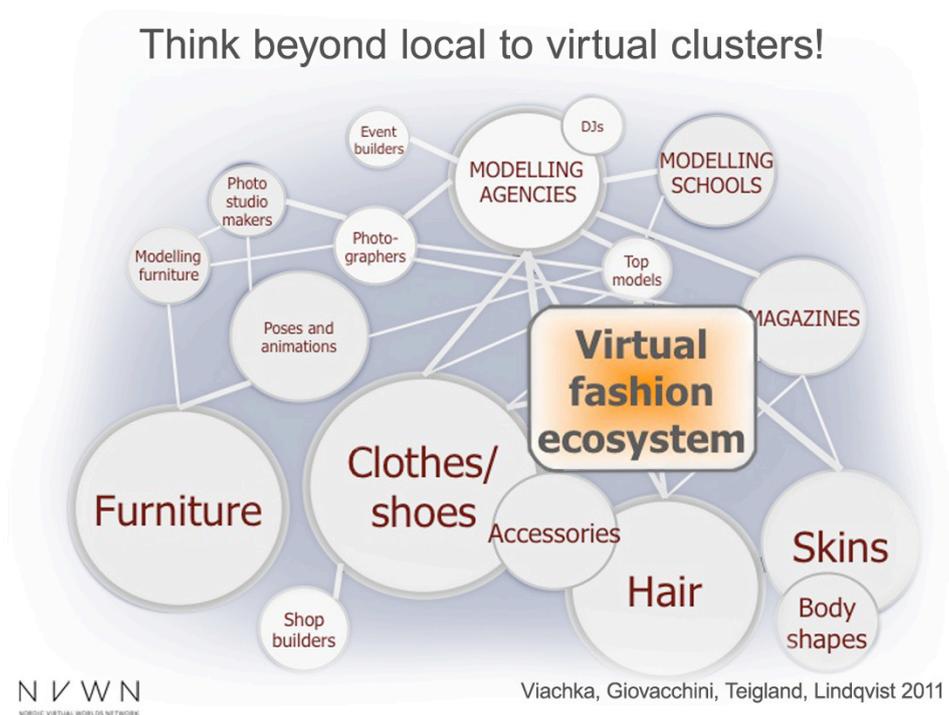
- Better core structures would enable and encourage more of the talented workforce to stay in the region and in this way benefit the local industry as well as sectors benefitting from new innovations.
- To ensure a continuous supply of talented labor to the industry, educational initiatives from primary to higher education levels should also be encouraged.
- Additionally, inter-disciplinary research should be stimulated in order to create a deeper understanding of the potential of virtual worlds and related technologies

#### *6. Build bridges between regional contexts and regional actors.*

- The Nordic industry appears to be lacking specific innovation hubs as opposed to those found in Silicon Valley. Considerable research and policy experience over many decades and across many countries has shown that strong regional innovation hubs, centers of excellence and clusters are essential to innovation, learning and firm competitiveness.
- The regional dimension is well established in the Nordic countries. Clusters of Internet excellence and 3D visualization (Oulu, Gothenburg) have been shaped by national level competitiveness policy goals, among others. However, more initiatives that address cooperation across firms and national borders ought to be encouraged.
- Nordic ministries and actors could powerfully pursue Nordic collective policy actions aimed at supporting regional linkages and crossovers at or near the intersection of the following: education/training, learning, mobility (e.g., smart phones and tablets), gaming, creative industries, and health-care.
- Regional authorities and organizations could support the type of conference noted above and also become supporters of sector initiatives that link VWs to other creative and emerging sectors.
- Regional seed funding and local authorities will need to be informed about the VCEI and the community as an important source as they will need to know about the 3D Internet opportunities themselves. In this respect, the VCEI should seize the opportunity of spreading information and attracting a community.
- Based on our research, we discovered that the VW technologies enabled entrepreneurs located in the Nordic region to develop their virtual social networks such that they may access important resources in other regions of the world. They may therefore supplement their prior social networks with virtual networks, yet it is unclear if people in the Nordic region have different networks than those in other areas such as Silicon Valley since we did not do such a comparison. However,

it became quite apparent that many of the more successful entrepreneurs become global and that Silicon Valley is a hub for networking. Regions and the Nordic region in general need to link to those hubs that exist already: in particular in Silicon Valley.

### Virtual Ecosystems Are Developing in Various Industries, Such as the Fashion Industry



As can be seen, there are many ways in which a Nordic effort can be organized. Loose cooperation already occurs, but it appears that there may now be a need for a more concerted and structured in order to realize the full potential that the industry can offer the region.

There is a need for an initial three-year strategy that details what actionable measures should be taken and how they will be financed and evaluated. This strategy needs to start from the key challenges identified earlier and to develop concrete measures in the priority areas we have listed.

There is a clear potential for ICT heavy Nordic societies and economies to at the forefront of emerging forms of immersive Internet and virtual worlds.

# APPENDIX 1

## – List of NVWN Participants

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Remko Helms, Utrecht University, Netherlands

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Per Jonasson, Independent, Sweden  
Thomas Kohler, Hawaii University Pacific, USA  
Benita Maria Merz, SSE, Sweden  
Gowri Pujitha, Student, India  
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Serdar Temiz, IC You AB, Sweden  
Claus Uriza, PopArt Lab, Second Life  
Assia Viachka, SSE, Sweden  
Zeynep Yetis, SSE, Sweden

#### **5. International Advisory Group**

Anders Grönstedt, Train for Success, USA  
Paul Coen, Sonicviz, Japan  
Professor Brian Donnellan, National University of Ireland, Maynooth, Ireland  
Terri Griffith, Santa Clara University, USA  
Steve Mahaley, Duke Corporate Education, USA  
Martha Russell, Media X at Stanford University, USA

#### **6. NWWN Higher Education Community**

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Inge Knudsen, Virtual Learning  
Linda H. Nielsen, University College Lillebæst  
Sisse Siggaard Jensen, Roskilde University

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Mats Deutschmann, Umeå University

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Satish Patel, Umeå University

David Richardson, Linnaeus University

Robin Teigland, SSE

**Other**

Steve Mahaley, Duke CE

**7. NVWN Steering Committee to take NVWN forward after project**

Carmela Dell’Aria, University of Palermo, Italy

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Elia Giovacchini, Stockholm University (previous NVWN member)

Ates Gursimsek, Roskilde University, Denmark

Stella Hadjistassou, University of Cyprus, Cyprus

Steve Mahaley, Duke CE, UK (previous NVWN affiliated member)

Judith Molka-Danielsen, Molde University College, Norway

Stylianos Mystakidis, University of Patras, Greece

Miriam Reiner, Technion, Israel

Robin Teigland, SSE, Sweden (previous NVWN member)

Serdar Temiz, KTH, Sweden (previous NVWN member)

Eilif Trondsen, Strategic Business Insights, USA (previous NVWN member)

**8. NVWN Community Members**

On the NVWN website, 103 individuals from across the globe have signed up to be a member of the NVWN Community.

# APPENDIX 2 – NVWN Online Resources

NVWN website: <http://nordicworlds.net/>

Twitter: #NVWN

Facebook: <https://www.facebook.com/NVWNNet>

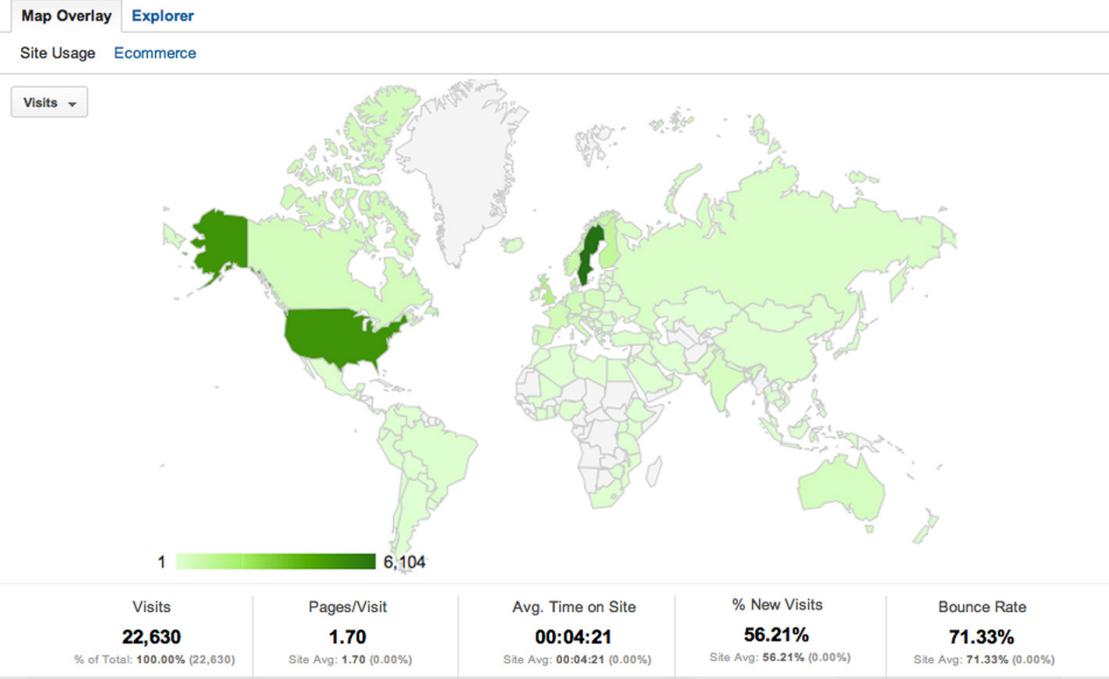
Livestream: <http://www.livestream.com/nordicworlds>

Slideshare: <http://www.slideshare.net/eteigland>

## NVWN Has a Strong Web Presence

The collage illustrates NVWN's digital footprint. At the top left is the NVWN website header with the text 'NORDIC VIRTUAL WORLDS NETWORK'. Below it is a Facebook post from Robin Teigland dated January 19, 2012, titled 'NVWN Presents to Nordic Innovation – January 19'. The post text mentions a presentation on Thursday, Jan 19, 11:30 to 13:00 CET / 2:30 to 4:00 am SLT, sponsored by Nordic Innovation. To the right is a Twitter search for #NVWN, showing tweets from Robin Teigland and others about vAcademia presentations on Jan 18, 16-17 CET / 7-8 am SLT. Below the Facebook post is a screenshot of the NVWN Facebook page, showing the profile picture, name 'NVWN – Nordic Virtual Worlds Network', and a post about the January 19 presentation. At the bottom left is the NVWN logo with the text 'NORDIC VIRTUAL WORLDS NETWORK'. On the right is a slide titled 'New Ways of Working Virtual Worlds' with a date of November 2011.

### NVWN Has Built a Global Community



# APPENDIX 3 – List of NVWN Reports and Executive Summaries

## ***List of Reports***

These reports can be downloaded from the project website:

<http://nordicworlds.net/project-findings/>

## **Website, VCEI, and Community**

1. Nordic VW Network (NVWN) Website
2. Final Scientific/Expert Report on Virtual Center for Entrepreneurship and Innovation (VCEI): Creating a Virtual Center for 3D Internet Entrepreneurship and Innovation

## **Innovation and Entrepreneurship through VWs**

3. Literature Review and Selection of Best Innovation Practices in Relation to the Emerging 3D Internet
4. Final Scientific/Expert Report on Best Practices in VW Innovation: A look at Virtual World Platform Providers in the Nordic Region
5. Literature Review and Selection of Best Practice Cases in Entrepreneurship
6. Final Scientific/Expert Report on VW Entrepreneurship: A Look at Entrepreneurs in the Nordic Region Exploring the Use of Virtual Worlds for Entrepreneurial Activity
7. Final Scientific/Expert Report on the Future of Innovation and Entrepreneurship in Virtual Worlds

## **NVWN Project Summary**

8. Final Scientific/Expert Report on NVWN Summary and Implications for Policymakers
9. Final Communication Report

## ***Executive Summaries of Reports 1-7 and 9***

### **1. Nordic VW Network Website**

One of the key channels of communication for the NVWN is the official website, [www.nordicworlds.net](http://www.nordicworlds.net), launched in late spring 2010. The website is structured in a way to favor its fruition with a limited amount of sections and provides a major interface with social media channels, e.g., Twitter. This report details in the first part the website structure and in the second part the technological choices that we made.

### **2. Literature Review and Selection of Best Innovation Practices in Relation to the Emerging 3D Internet**

In looking at innovation in virtual worlds, a plethora of definitions for innovation types has resulted in an ambiguity in the way the terms 'innovation' and 'innovativeness' are operationalized and utilized in research. Terms such as radical, really-new, incremental and discontinuous are used ubiquitously to identify innovations. A review of the research literatures from the engineering, new product development and marketing disciplines in this paper attempts to put some clarity and continuity to the use of these terms both outside and within innovation literature outside virtual worlds.

Our argument is that it matters how innovations are labeled from the perspective of entrepreneurs, practitioners and users in the business use of virtual worlds. In the literature, conceptual distinctions between radical, modular, architectural and incremental innovations are made, as well as between one-off and serial innovation is identified and how the innovation process may be unique for that particular innovation type. Distinctions between a technological and a marketing perspective, as well as both a micro-level and a macro-level perspective are also identified.

To enable virtual world business entrepreneurs, other innovation practitioners, and innovation researchers to develop understandings of each others' bodies of knowledge, propositions for research are extended models of innovation strategy are conceptualized in a perspective biased towards business practices. This review of innovation and innovativeness will then enable us to better select best virtual world / 3D practices in innovation and innovativeness as we move forward in WP2.

### **3. Final Scientific/Expert Report on Best Practices in VW Innovation**

The main focus in this report is to provide an overview of the present virtual world (VW) platform providers in the Nordic region with a particular focus on innovation. With this in mind, we selected four different virtual world platform providers: Habbo Hotel by Sulake (Finland), Entropia Universe by Mindark (Sweden), Stardoll (Sweden), and realXtend (Finland), from the region for a more structured analysis. In this report, we will examine each of these cases individually, using information from their early stages to their present day position, as well as conduct a cross-case analysis to search for patterns

related to innovation. Our study combined multiple data collection methods: primary data obtained from interviews conducted with top management representatives in the selected case companies as well as secondary sources such as interviews, presentations and articles and information found online. To the greatest extent, qualitative data have been used. Similarly, research has been undertaken by multiple investigators in Work Package 2.

Our analysis was based on searching for commonalities across the cases related to approaches to business and innovation activities in virtual world environments. We were inasmuch interested in commonalities as in differences across the cases. Thus, cases were investigated first separately in order to grasp the uniqueness of the case (within-case analysis), and all instances are reported as stand-alone cases. In each case, we describe what is unique in the case since uniqueness is nested in the cross-case methodology. The descriptions were compiled based on a list of 13 dimensions that were structured to guide us in our within-case comparisons before conducting our cross-case analysis.

In our cases, we found examples of different kinds of innovation activities: business model innovation (MindArk), marketing innovation (Sulake, Stardoll), and technology innovation (realXtend). However, all of the cases clearly show that the real world serves as a precondition to providing meaningful innovations since we find that the structure and meaning of innovations in virtual worlds appear to be largely derived from the real world. Furthermore, we find that these organizations have designed mass-customized, scalable virtual world applications, i.e., the mass production of individually customized goods and services, and thus challenge the “one-size-fits-all” concept. Their virtual world platforms enable their end-users to tailor make their own uses and experiences of their virtual world. As a result, we suggest that virtual world innovation is the extension of creativity through technological advancements that will result in the advancement of social, cultural, and economic progress.

It appears that the virtual environment is playing a growing role at present day in economic and cultural change as most Western societies have begun to experience a rise in the creative industries (Florida, 2002). With present high economic uncertainty, creativity embedded in technology advances new opportunities of intellectual property rights and economic growth. It offers employment opportunities and business collaborations (between platform owners and offline companies), user innovations and other measurements associated with economic growth.

#### **4. Literature Review and Selection of Best Practice Cases and in Entrepreneurship**

This report focuses on entrepreneurship in relation to the 3D internet in general (aka virtual worlds, virtual environments, etc.) and the selection of best practices specifically.

In preparing this report, we focused primarily on the Nordic countries and the USA and on empirically-based research articles. A stated focus of the Nordic Virtual Worlds Network project is on the “serious” use of the 3D web, ie for serious businesses, but this serious/fun division is debatable since much of the use today of 3D web is for entertainment and relates to the creative industries. We return to this later.

We faced three major challenges when going through the scientific research literature: 1) the lack of and fragmentation of knowledge due to the relative infancy of the 3D internet field and its interdisciplinary nature across many research fields, 2) the fluid definitions of terms regarding the 3D internet and fun/serious business, and 3) the difficulty of getting an overview and from this base, determining relevant activities (we prefer the term “next” rather than “best practices”). We deal with these three challenges in turn.

Firstly, in the case of building knowledge in this emerging field, we suggest that it is the interdisciplinarity (social sciences, humanities film studies, computer science) that may strengthen the current fragmentation, such as others suggest (Hunsinger, 2010), and which is a conclusion in a recent literature review of “Virtual Environment Studies” in relation to social and group phenomena (Sivunen & Hakonen, 2010).

Secondly, defining our key terms “entrepreneurship” and “3D internet” is a real challenge, but we simply put down a humble stake here for dialogue and debate with academia and practitioners. Input from the different disciplines with their traditions is valuable. In this report, we propose using 3D internet rather than virtual worlds (or other common terms, such as virtual world games or MMORPG - massively multi-player online role-playing games). In regards to the relationship between entrepreneurship and innovation, we briefly discuss definitions and overlaps for further discussion. We include both the more “fun” uses with “serious” uses since many businesses in 3D internet currently offer fun content, including entertainment and socializing with games, etc. We suggest that the social aspects of the “fun” uses offer valuable examples of the potential for growth of current digital technologies with aspects of 3D. The situation of the 3D internet is viewed as part of media convergence (Jenkins, 2006; Lowood, 2006; de Freitas & Griffiths, 2008) or a “blurring” of the lines between media types and platforms, where online games technologies and practices are becoming more pervasive and commonplace as social practice.

Thirdly, by presenting an overview of practice, our aim is to consider themes for our later work on entrepreneurial activities/practices. We offer an initial overview within different sectors and discuss trends especially relevant for entrepreneurship in the creative industries. We apply a structural framework in order to gain a sense of an overview and proceed to offer a narrower focus for the upcoming, particular entrepreneurial activities (the selection of activities / practices continues during 2010). Herein, we lay

the groundwork for the later work packages and deliverables in NVWN and our own selection of activities.

In his report, we start this selection process by delineating the contours of our WP3 potential areas for entrepreneurial activities, namely NGOs and creative industries, but this may shift -the selection of practices is due in a report (delivery 01.11.2010).

#### *Purpose and structure*

The purpose of this first milestone/delivery for WP 3 is primarily to identify and select best entrepreneurship practices with a focus on best practices. In order to obtain this goal, we seek to get an overview of the literature and field, leading to a discussion and plans for further action. The examination of the literature is intended for use within our network as grounds for discussing the development of practices within innovation and entrepreneurship. By going through the literature, we hope to kick off some collaborative thinking among the NVWN network during 2010 and prepare the subsequent in-depth work with a few cases related to NGOs and creative industries. The report is structured in four parts as follows: 1) our own perspectives, 2) the approach to the topic of entrepreneurship in relation to the emergence of virtual worlds / 3D internet, 3) the definitions and review of literature on entrepreneurship, 4) selection of best entrepreneurial practices, and 5) discussion and preliminary conclusions.

### **5. Final Scientific/Expert Report on VW Entrepreneurship: A Look at Entrepreneurs in the Nordic Region Exploring the Use of Virtual Worlds for Entrepreneurial Activity**

This report reviews our approach, case studies, results, and implications for the NVWN Work Package 3: Entrepreneurship, and it is written with practitioners and policymakers in mind. We base our work on the concepts of affordances, or the material and social properties of any technology in relation to affording actions to humans, of the 3D web (or 3D internet) or virtual worlds (hereafter noted with the term VWs), social networks, and the diffusion or spread of innovation. We conducted seven case studies through qualitative interviews with entrepreneurs across three sectors working with VW internet technologies: 1) film and multimedia, 2) health care, and 3) high-tech industries. The entrepreneurs are located in or have strong connections to the Nordic region, e.g., Nordic citizens living abroad, and are all internationally oriented. The results of the case studies of entrepreneurs highlight three different aspects related to working with VW technologies: 1) VW affordances, 2) the importance of social networks, and 3) virtual collaboration in complex project teams.

1) The affordances that VWs offer (or afford) according to our cases, relate to the basic needs and aims of entrepreneurs in regards to the communication of ideas and plans, collaboration, creation of value, and organization of economic activity. The questions

we posed entrepreneurs in the case studies explore the relation of VW affordances to their specific entrepreneurial activities. The unique affordances of VWs described by entrepreneurs are categorized in three areas: a) flexibility, b) simulation, and c) visualization. Additionally, there are overarching challenges for affording interaction in today's "virtual worlds" including poor usability and compatibility, low-resolution graphics, unstable technical performance, and the association of commercial virtual worlds with fun, porno, and games. However, the affordances of VWs can be seen as "potentials" meaning that they have the capacity to become "next" practices or lead to future success or usefulness even though the potentials of any technology are not controllable or predictable. Prahalad and Ramaswamy (2003, 2004)<sup>2</sup> discuss the potentials in next practices of innovation and suggest a shift of focus away from products and services and towards experience environments supported by a network of companies and consumer communities.

2) Social networks play an important role for the exchange and acquisition of knowledge and resources between entrepreneurs and for co-creation processes<sup>3</sup> between entrepreneurs and those who use their company's products and services. In the open-source software<sup>4</sup> movement in particular, there seems to be a reliance on networks for co-creation and the development of the best ideas. Social networks are used to gain knowledge about funding strategies, technical know-how, legal advice on intellectual property (IP), and cooperation with business partners about the distribution of their goods and services. Such social networks co-create contents in VWs as well as collaborate, such as on open-source software and standardization of formats. However, this collaboration and development are accompanied by difficult legal, proprietary issues concerning copyright and IP (intellectual property).

3) Entrepreneurs are dependent upon developing virtual collaboration skills involving the distributed management of complex, global projects and project members across multiple media platforms. The entrepreneurs utilizing VWs are inter-disciplinary, multi-cultural, and they have to negotiate complex economic issues. This entails a "spaghetti"<sup>5</sup> type of organization of work.

## **6. Final Scientific/Expert Report on Virtual Center for Entrepreneurship and Innovation (VCEI): Creating a Virtual Center for 3D Internet Entrepreneurship and Innovation**

One objective of the NVWN project was to create a Virtual Center for 3D Internet entrepreneurship and innovation. One of the reasons for this was that we observed that many 3D Internet efforts were conducted in innocent isolation from one another. The purpose of establishing such a center can be summarized in the following:

- To stimulate and facilitate networking and knowledge and resource sharing among Nordic individuals and organizations interested in 3D Internet and entrepreneurship/innovation.

- To connect Nordic actors to leading 3D Internet actors working with entrepreneurship and innovation in other global areas to improve knowledge sharing as well as business opportunity development (e.g., Silicon Valley).
- To increase the level of knowledge concerning how to develop and use 3D internet in the context of entrepreneurship and innovation.

On Wednesday, November 9, 2011, the Virtual Center for Entrepreneurship and Innovation was officially launched. The center consists of a 96-seat auditorium, two workspaces equipped with discussion group layout, office layout, presentation opportunities, etc., all of which can be changed according to the needs of the users. In addition to an outdoor area, there is also a gallery where information and ads can be showcased as well as a control room and planning room under the auditorium.

This report details the development of the virtual center and explains the choice of platform. The plan for the future is that entrepreneurs and researchers interested in the virtual center will be given the opportunity to use it. Several project members of the NWWN project are also planning monthly seminars focusing on entrepreneurship and innovation in virtual worlds. This means that the center will fill a need beyond the project period.

### **7. Final Scientific/Expert Report on the Future of Innovation and Entrepreneurship in Virtual Worlds**

The purpose of this report is to provide a strong and reality-based understanding of the future of innovation and entrepreneurship in Virtual Worlds (VWs) since the NWWN team thought it was important to put the future in the context of what we have seen and experienced over the last 10-20 years during which time we saw VWs and related technologies gain the attention of the general public (e.g., beyond the confines of technologists and futurists).

This report starts with examining the promise that many users and analysts of VWs have seen for VWs, not only in providing interesting and fun places for children's entertainment (which still dominate VWs as an industry) but also for more serious applications that both large and small businesses have seen as potentially interesting and valuable. The first section reviews a range of applications and notes how many large companies, including IBM and BP, for instance, have used VWs for a range of activities of which thousands of their employees have taken advantage, by accessing virtual environments from many different parts of the world. We also note that learning and training applications have been among the most popular, and this seems to continue, as students, academics and corporate training personnel are now experimenting with the use of open source VWs for such applications.

After the discussion of the promise offered by VWs, the report's second section reviews the evolution of VWs to give readers a time-line perspective of major developments of

VWs and what some of the major phases have been in the evolution of VWs. This section also takes an objective and critical look at why VWs have not achieved the rapid growth and mass adoption that many analysts predicted in the mid-2000s. Some of the excessive enthusiasm and lack of critical assessments in this period was perhaps inevitable as part of the “hype curve” that most emerging technologies experience. VW enthusiasts were not as encumbered by the challenges that many “newbies” faced when trying Second Life for the first time, for instance. The section identifies and discusses some of the major obstacles that have held back VW adoption by users who have embraced the Web by the billions (and the very rapid growth in users by Facebook and even more so by Zynga illustrate what user-friendly technology combined with strong user utility can bring in a very short time period).

At the core or heart of any VW experience lies the technical VW platform and its functionality, including the affordances of the platforms (which determine what users can and cannot do and how easy or difficult it is to accomplish various tasks). Section three of the report therefore reviews and describes a number of major proprietary as well as open source platforms. The discussion also notes the positioning of the platforms in the marketplace and points out which of the platforms are no longer available, either because they have been acquired or failed to gain sufficient customer base. These market realities are not unique to the VW industry of course as companies taking emerging technologies to market fail more often than not. And given the size of the VW industry, in terms of revenues, analysts have expected market consolidation to take place.

Finally, section four peers into the future through the use of scenarios that provide four “alternative futures” (rather than future predictions), each of which is structurally different because of the combination of driving forces that shape each particular scenario. At the NVWN workshop in Reykjavik, Iceland in the summer of 2011 the NVWN team agreed that technology (closed versus open) and economy (closed versus open) should be the two “axes of uncertainty” behind our scenarios, and the report section presents a scenario narrative for each of the four scenarios, including what the implications are for innovators and entrepreneurs of the particular scenario.

## **9. Final Communication Report**

The communications plan has worked extremely well, and we successively expanded the ambitions of the plan during the course of the project. Our expectations for website visits, community members, etc. and for general interest in the project on an international level have been exceeded by far.

- Since the launch of the NVWN website, [www.nordicworlds.net](http://www.nordicworlds.net), in spring 2010, the website has experienced a continuous increase of viewers, linked to higher activities and awareness of the project and its partners, and there is a balanced mix between new and returning viewers. As of March 2012, we had 12,787 unique visitors, 22,630

visits, and 38,556 page views. The average time spent on the website is significantly higher than the average for this type of website, at 4:21 minutes compared to 2:30 minutes. Readers come from almost every country (that has internet access) around the world, though mainly from Sweden and USA.

- NVWN and its members have been active on all the major Social Networking Sites (e.g., Facebook, Twitter, LinkedIn). These activities have had a positive impact in attracting new viewers to our website and to keep the interested people updated. Of our Facebook account viewers, 51% are male and 47% are female and 44% are in the 25-34 age group.
- Our book project titled “Postcards from the Metaverse” is well underway and has attracted considerable international attention. The edited book will comprise a number of short reflections from some of the world’s key thinkers on the potential (and dangers) of VWs. We have received a publishing contract offer from the international publisher, Palgrave, and have around 30 chapter contributions from authors across the globe.
- Project members have arranged and conducted a variety of national and international presentations to various groups: from academic and practitioner conference presentations to using the project aims and objectives in graduate and undergraduate education. Many of these have been livestreamed and recorded and are available on our livestream channel: <http://www.livestream.com/nordicworlds> and the presentations can be accessed on slideshare: [www.slideshare.com/eteigland](http://www.slideshare.com/eteigland).
- The project organized several mixed reality seminars involving people from across the globe. For example, one seminar on innovation involved individuals not only from the Nordic region but also from Israel, India, Turkey, and the UK.
- In addition to the above, the SSE Media Management Strategy module was run by the project owner in 2011 and involved several high-level participants from the Nordic VW and gaming industry. We uploaded materials and streamed sessions on the project website so that anyone anywhere in the world can access for free the knowledge generated: <http://nordicworlds.net/2011/02/07/virtual-world-and-gaming-live-stream-now/>.
- The SSE island in Second Life was actively used as part of the project and during 93 weeks of the project (13 April 2010 to 23 Jan 2012), we had 1298 visitors.
- The VCEI-Virtual Center for Entrepreneurship and Innovation was launched in Second Life in November 2011 and has hosted several events to date.
- The project will continue to live on as a community as the NVWN Steering Committee consisting of 12 individuals both from NVWN as well as external will take over in March 2012.



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# NVWN

## – the Nordic Virtual Worlds Network

Final Report – Summary and Implications for Policymakers

This report is based on NVWN – the Nordic Virtual Worlds Network, a two-year Nordic research project and network combining academics, practitioners, and entrepreneurs running from March 2010 to February 2012. The project investigated the opportunities and challenges that the emerging 3D immersive Internet and virtual worlds pose for entrepreneurship and innovation. During the two years, the project produced several reports on topics such as entrepreneurship, innovation, and the future of the virtual worlds and these can be found on our project website: <http://nordicworlds.net/project-findings/>. Appendix 3 also provides more information on these reports.

While we found that activities in-world or in online spaces take many forms and generally involve multiple organizations and individuals, there are a wide range of commercial and value creation processes underpinning these spaces and what happens within them. These processes involve firms of all sizes, innovation, and entrepreneurship, and policy can make a very considerable difference to the climate for successful firms and entrepreneurs.

Our project findings clearly indicate that policy is needed to support the 3D Immersive Internet based industry. This report is very narrowly focused on analyzing the policy implications of the emergence of an industry of firms and economic actors that depend upon the 3D Immersive Internet for their prosperity.

Nordic Innovation is an institution under Nordic Council of Ministers that facilitates sustainable growth in the Nordic region. Our mission is to orchestrate increased value creation through international cooperation.

We stimulate innovation, remove barriers and build relations through Nordic cooperation

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