A cluster initiative: DIGISOL
Digital solutions, opportunities for growth
Smart growth

We are very pleased to be sending you this contemporary magazine detailing the first result of the DigiSol project. I am proud of the end result. As councillor for Economic Affairs of the project’s lead partner, Breda Local Authority, I was closely involved in this project and day in, day out I experience in practice how important digital applications are for the business community. Recent research by PWC International, which I read not so long ago, revealed that companies that use such ‘digital tooling’ (an alternative term for digital applications), are able to innovate more effectively. Of the companies surveyed that use digital tools widely for innovation, no fewer than 77% were shown to perform better than organisations that only make moderate use of such tools.

Governments at national and European level are realising the importance and necessity of investing in this field. Working for the ninth largest city in the Netherlands, it is clear to me that the national government is focusing heavily on the use of ‘breakthrough projects’. These are intended to increase ICT know-how and possibilities for companies, governments and civil society organisations. Digital applications in the field of big data and visualisation with cross-links to economic sectors and SMEs play a key role in this.

Europe is also focusing heavily on the development of the ‘Smart Growth’ programme which features prominently within the ‘Europe 2020’ framework, with core elements being a greater emphasis on research and innovation and on stimulating the use of ICT products.

This links nicely with the way in which the DigiSol project is designed. The idea is to learn from existing Interreg successes and examine how these can be applied on a cross-sectoral basis. DigiSol combines a multitude of products from European partners, ranging from the healthcare sector, 3D printing, big data, retail and visual design to high-quality ICT technology and even drones. The end products therefore offer an excellent instrument which can be used to fulfil the Europe 2020 objectives.

The 7 chapters provide you with information on knowledge-sharing, trends, successful examples and future collaboration. I hope you enjoy reading this magazine. I am sure it will inspire you and give you some great new ideas!

Bob Bergkamp

Councillor for Economic Affairs
Municipality of Breda, The Netherlands
Introduction

The Interreg 2 Seas DigiSol cluster (or Digital Solutions) was initiated by the Municipality of Breda. The other partners in this project are Avans University of Applied Sciences (Breda, NL), Kent County Council (UK), Bournemouth University (UK), REWIN West-Brabant (NL) and Sint Lucas Anwerpen (part of the Karel de Grote University of Applied Sciences) (BE). All six partners have plenty of knowledge and experience relating to the central theme of the cluster.

This project brings together the results of the 2 Seas projects VIVID, SHIVA, 3I and 2 Seas Trade to highlight opportunities for digital applications.

In the SHIVA project the development of digital applications was focused on healthcare while 3I the focus was on the unmanned aerial vehicle industry. Within 2 Seas Trade companies were supported with international trade and during the process it became clear that new digital technologies play an important role in helping small and medium-sized enterprises (SME) promoting themselves in other countries. In the VIVID project a range of digital applications were developed and work focused on encouraging the creative industry which, among other things, produces digital applications.

The DigiSol cluster’s main objectives are the consolidation, valorisation and distribution of the results of the 2 Seas projects, carrying out of research in the form of a survey into best practices in the field of digital applications and increasing the use of creative digital solutions in various business sectors and thereby to improve the development possibilities for businesses.

By jointly highlighting the possibilities of digital solutions, the partners want to encourage future cooperation between the creative digital industry and traditional sectors and stimulate the use of digital solutions.
The DigiSol cluster project brings together a range of digital solutions, for example in the field of unmanned aerial vehicles, in the creative industry, in healthcare and international trade. It is therefore difficult to position it within a single policy field of the European Union and of the Member States. At European level this project links up most with the Digital Agenda for Europe (DAE). The agenda was established in 2010 and then developed in more detail and partially revised. The latter is no surprise because the developments in this sector are taking place so rapidly that policy and priorities can scarcely keep up. However, the main objective of this agenda continues to be restarting the European economy and supporting citizens and businesses to get the maximum possible out of the use of digital technologies. The importance of the digital agenda is clearly stressed in the EU 2020 strategy, in which it is qualified as 1 of the 7 pillars. The Agenda includes no fewer than 101 activities, grouped into 7 priority areas (December 2012) (see box below).

The EU has high expectations as regards the implementation of this Digital Agenda, namely economic growth of 5% in the coming eight years and 3.8 million new jobs. Within the framework of this Agenda, all kinds of umbrella concepts and projects

**EU Digital Agenda**

- The creation of a new and stable broadband environment
- A new public digital service and infrastructure
- A large coalition for digital skills and jobs
- The acceleration of cloud computing and
- A new electronic industry strategy
- Propose EU cyber-security strategy and directive
- Update EU’s copyright framework
are to be initiated to test new solutions. A couple of examples of this are: e-SENS (aimed at public services), e-Health (new e-systems in the healthcare sector) and the Smart City concept (to accelerate the use of digital solutions in urban areas).

The relationship between the creative and digital sectors is also becoming ever clearer at European level. The European Creative Industries Alliance (ECIA) set up for this purpose advocates more investment in the creative industry to encourage crossover with and innovation in various business sectors.

The same is in evidence in the Entrepreneurship 2020 Action Plan: Europe’s ambition to create new business opportunities and to accelerate the transformation of businesses by stimulating the use of new digital technologies. It has been established that 41% of businesses do not yet use digital applications and that only 2% make maximum use of the digital possibilities.

The Digital agenda is also a high policy priority in the various Member States involved in the Interreg 2 Seas programme. Below is a brief explanation.

The Netherlands

In the Netherlands it is a feature of the TOP sectors policy, in which nine sectors are designated as spearheads. The continued development of digital solutions and applications is not only a feature within the ‘High Tech’ top sector, but also within various other top sectors such as the creative industry, life sciences and health and logistics. Knowledge of materials and ICT are key elements of the High Tech top sector. As a result, this top sector is an important enabler for many other application sectors, such as energy, chemical, life sciences and agri-food. The Creative Industry top sector is regarded in the Netherlands as the most dynamic sector of the Dutch economy. The creative sectors (such as design, media and entertainment, mode, gaming and architecture) are an enabler of innovation in other sectors. They also generate creative solutions for challenges facing society in areas such as care, security and energy.

United Kingdom

The UK government is investing over £780 million to upgrade broadband connectivity so that at least 95% of the UK has access to super fast broadband connectivity by 2017. The intention is that this investment will be a catalyst for the wider adoption of new digital technologies by both citizens and businesses especially those around big data, Internet of things and augmented reality technologies.

Nationally, the government is committed to increasing the number of online transactions by implementing a ‘digital by default’ strategy to promote greater uptake of online services and improve national digital literacy to foster greater citizen digital inclusion. In addition, the government is investing through its innovation agency, the Technology Strategy Board’ in a number of projects to help stimulate private sector investment in new digital technologies and solutions.
Belgium

In Belgium innovation and the digital policy relating to the business community and education is shaped and implemented by the government agency for Innovation by Science and Technology [ Agentschap voor Innovatie door Wetenschap en Technologie] (IWT). It makes recommendations to the new Flemish government in the form of various key questions designed to increase innovation performance in Flanders. The most important of these is to enhance the support provided to innovative businesses. A number of supporting initiatives have already started at universities such as in Gent where there is robust cooperation between the business community and research institutes. A key focus for the support of innovative businesses is the degree of mutual cooperation and the involvement of research institutions. However, there are still a range of initiatives to be developed within several strategic domains, in particular focusing on digital media and care-related and medical science.

France

‘French Tech’ is the initiative by the French government and its partners which aims to support start-ups and to give them the possibility of reaching the global market in all sectors. As is the case all over the world the digital industry is an important driver for development including in the field of digital ‘pure players’, med-tech, bio-tech, and clean-tech.

There are three key objectives, namely:

• An initiative to support ‘French Tech’ businesses in France and globally;
• The development of ‘start-up accelerators’ for which a € 200 million investment fund is available;
• Promoting the international visibility and attractiveness of the French start-up support system. For this a budget of € 15 million is available.
Big Data Analysis

IBM reports on its website that 2.5 quintillion (2,500,000,000,000,000,000) bytes of data are generated every day. That data comes from purchases in web shops, tweets, weather stations, text messages and digital photos. It is so much data that people can scarcely see any logical connection. Consequently, all hope is pinned on ultra-fast computers which can identify patterns in all this data based on complex algorithms. A good example is the Spotify music service which processes 2 terabytes of user data every day to analyse which music is being listened to, when and from which location. Some time ago hip-hop artist Jay-Z was going to come to Stockholm to perform. However, a data analysis by Spotify revealed that most fans lived in Göteborg. Spotify communicated this to the record company and the decision was taken to relocate the concert to Göteborg.

Larry Page, co-founder of Google, recently suggested at a TED conference that medical information relating to everyone on the planet should be made available anonymously to science. It could save a hundred thousand lives per year. Research has shown this to be a realistic estimate, but data specialists also warn about the risk of compromising people’s privacy. An anonymous list of health-related facts would appear to be anonymous but, if various sources are linked and compared (for example debit card payments that a specific pharmacy, a digital diary, and hospital parking data) it would not take much to establish who the anonymous data referred to. If administrators are prepared to treat this data in a very transparent, ethical and responsible way, Big Data may generate huge added value.

Data Visualisation

Big data analysis is a powerful tool which enables businesses to gain new insights. Without the tools to make information clear and transparent, a lot of that added value will go unnoticed. Data visualisation is the ideal way to ensure that big data actually has an impact. The interpretation of a cleverly designed (interactive) visualisation takes much less time than ploughing through texts and series of numbers. A very basic example is the colour coding used for share prices. Red means in the red and green means in the black. Visualised information will ensure that better decisions are taken and fewer errors are made. Strikingly enough, the market for data visualisation and information design is still in its infancy. Not many businesses are specialised in this area. The number of courses which offer training to students in this field are still few and far between. The pro-
gramming of tools which can visualise data independently (in a structure designed by information designers and visual designers) is a specialist field offering all kinds of promising opportunities in the new digital market.

Augmented reality can be used in the context of maintenance work during complicated procedural repairs based on step-by-step supervision of the process.

Augmented reality in surgery

Wearables
In response to the question of what the stand-out trend is going to be in the coming years, several of those interviewed in the DigiSol survey answered with the word, Wearables! This is technology worn close to the body. By means of sensors, wearables can collect (biometric) information or present information from outside (for example from the Internet).

At the moment there is a real race going on to find out who will launch the first truly successful eHealth wearable. The FitBit Flex, Jawbone Up and Nike Fuelband, all in the form of a wristband, are already available on the market. However, these devices do little more than register motion activity and sleep.

According to a variety of sources, Apple is going to launch a smart watch in the near future which, in addition to movement, can also register your pulse, blood sugar levels, UV radiation and moisture balance. The fascination for collecting all this health information is also referred to as ‘the quantified self’. Clearly, all the (big) data that these eHealth wearables collect will lead to new health-related insights.

Google Glass is a good example of an augmented reality wearable. It is a kind of wearable smartphone ‘pair of spectacles’ which allow you to view, among other things, context-related information from the Internet.

3D printed objects

3D printing
3D printing is currently a hot topic with a lot of media coverage; it fulfils the long-held desire of designers and engineers to be able to create 3D prototypes quickly. It also offers the possibility of producing unique items. What can be expected in the coming years?

The development of new printable materials will make it possible to print complex products such as sports shoes. A company called 3-Spark in the US has succeeded in printing semiconductors and sensors using a 3D print. This offers new opportunities in the field of electronics. At MIT (Massachusetts Institute of Technology) experiments are being carried out with 3D printed objects which change shape under the influence of external factors (such as heat, moisture, pressure, vibration). In the medical world, 3D scans and 3D printers will make customised prostheses an everyday occurrence. Restaurants will start pre-

Augmented Reality
The Centre for Retail Research in the UK predicts that in 2018 one in five stores in town centres will have closed. In the Netherlands the CBW-Mitex research agency asserts that 20-35% less commercial floor space is perfectly possible by 2020. Retail companies will therefore try to increase the attraction of their physical stores and showrooms by bringing the digital world closer to physical products. Reviews and recommendations by friends and acquaintances are presented with the products and augmented reality mirrors display an item of clothing over your mirror image.

The reverse is also possible, namely bringing digital products into the physical world. For example, IKEA has developed an augmented reality tablet app which you can use to see how their furniture will look in your home. In the medical world, augmented reality will be used to place projections of x-rays and MRI scans onto patients’ bodies to reduce the chance of errors being made during operations.

Wearables
In response to the question of what the stand-out trend is going to be in the coming years, several of those interviewed in the DigiSol survey answered with the word, Wearables! This is technology worn close to the body. By means of sensors, wearables can collect (biometric) information or present information from outside (for example from the Internet).

At the moment there is a real race going on to find out who will launch the first truly successful eHealth wearable. The FitBit Flex, Jawbone Up and Nike Fuelband, all in the form of a wristband, are already available on the market. However, these devices do little more than register motion activity and sleep.

According to a variety of sources, Apple is going to launch a smart watch in the near future which, in addition to movement, can also register your pulse, blood sugar levels, UV radiation and moisture balance. The fascination for collecting all this health information is also referred to as ‘the quantified self’. Clearly, all the (big) data that these eHealth wearables collect will lead to new health-related insights.

Google Glass is a good example of an augmented reality wearable. It is a kind of wearable smartphone ‘pair of spectacles’ which allow you to view, among other things, context-related information from the Internet.

3D printing
3D printing is currently a hot topic with a lot of media coverage; it fulfils the long-held desire of designers and engineers to be able to create 3D prototypes quickly. It also offers the possibility of producing unique items. What can be expected in the coming years?

The development of new printable materials will make it possible to print complex products such as sports shoes. A company called 3-Spark in the US has succeeded in printing semiconductors and sensors using a 3D print. This offers new opportunities in the field of electronics. At MIT (Massachusetts Institute of Technology) experiments are being carried out with 3D printed objects which change shape under the influence of external factors (such as heat, moisture, pressure, vibration). In the medical world, 3D scans and 3D printers will make customised prostheses an everyday occurrence. Restaurants will start pre-
senting meals in unusual forms using food 3D printers.

Internet-of-things
Devices and appliances are increasingly connected with each other through the Internet and able to convey information to each other. The computer is becoming a (less and less visible) part of everyday life. In the future fridges will start placing orders with supermarkets via the Internet, the thermostat will know when it needs to turn itself down once everybody has left the home and the Philips Hue lamps enable you to adjust your lights at home, using a smartphone app, for study purposes or indeed for a good night’s sleep.

The Internet-of-things may lead to a lot more convenience, insights and cost savings. The question is also being quite rightly asked as to how users will be able to determine which information they do and do not share. After all, if everything is connected via the Internet, will all these devices not be easily accessible for malicious hackers.

Online collaboration
Google Drive (formerly Google Docs) has for years offer the possibility of a single document being worked on by several people at the same time. With the introduction last year of Quip, Microsoft Office online and Box Notes it is becoming clear that online cooperation tools fulfil a concrete need. They link up with trends like ‘The New World of Work’ and ‘anywhere office’. Certainly within the framework of European collaboration this is a valuable development.

Sources: IBM, Wired Magazine, TED, MIT, MacRumors,
By combining and analysing the results of four 2 Seas projects, the cluster wants to gain an insight into the opportunities that digital applications can offer to businesses, authorities and knowledge institutions within the 2 Seas region. This chapter contains short descriptions of each of the projects with extra attention being paid to the digital solutions developed during the projects. In Chapter 5 general conclusions are drawn from the four projects and the digital solutions survey.

VIVID

Value Increase by Visual Design
For project partners see annex 1.

By: Kees Kerstens (innovation advisor, Municipality of Breda)

The Creative Industry top sector, of which visual design is part, is the most dynamic top sector of the Dutch economy. Creative sectors such as design, entertainment, fashion and architecture are an enabler of innovation in other sectors.

Anticipating developments, the Municipality of Breda (NL) started developing the cross-border VIVID project in 2010 (as lead partner). It did so together with a number of leading parties in the field of visual design (see partners). The aim was to stimulate the growth of the creative sector in the 2 Seas region through developing a transnational visual design network. In order to do this effectively, there was close collaboration between education, the business community and public authorities.

The project has three pillars which have a leverage effect on each other:
- Knowledge sharing and joint research in the field of visual design;
- Stimulating employment and entrepreneurship;
- Showcasing the possibilities of visual design through festivals and events.

The regions and towns and cities involved in the project have a few common issues:
- Although high-quality visual design education courses are being offered, there is a shortage of businesses that recruits graduates and a shortage of support options when starting up a company. The results is a brain drain to other regions.
- Educational institutions feel responsible for delivering quality, highly-trained students, but not for job creation.
- In the regions and towns and cities involved there is no clear vision relating to visual design. Festival organisations organise events which they think are appropriate. The sector’s willingness to collaborate is limited.

Results

The VIVID project is a total programme of approximately 30 projects. Because it is therefore impossible to give a description of all results, there will be an assessment of the results which link up best with the central theme of this cluster project. These are primarily realised in the first part of the project ‘Knowledge-sharing and joint research in the field of visual design’. The projects in this section relate to heritage, education, division of development facilities, big data and eye-tracking.

Youth project

The aim of the Youth project is to familiarise young people in the towns and cities of Cambridge, Southampton, Breda and Lille with the visual design sector, to show them what visual design can do and encourage them to study the subject at higher education institutes in the towns and cities. In the participating towns and cities more than 12,000 young people participated in activities organised within this project. These activities consisted of visits of visual design festivals, such as a gaming festival and informative meetings about how to find a job in the gaming industry. In addition, an education programme on visual design has been developed in Breda for children aged between 6 and 16. Moreover, a game has been developed with which young people can themselves make films, games and animations (www.anim2-0.com).
Digital Agent
One particularly interesting result is the 'Digital Agent' created by educational institute NHTV from Breda. Smartphones contain information about your appointments, surfing behaviour and social media networks. The NHTV product is intended to raise awareness among users of the information they share. It makes time and place dependent recommendations. The product enables users to receive information which only applies to them. In this way they can indicate which information they wish to receive from which provider. The project has been delivered as a demo/student app.

Beaulieu racer game
The Beaulieu racer game produced by Solent is a good example of a cooperation between a gaming company set up by two graduates from Solent University, Southampton and current students. The client, the Beaulieu motor museum (UK) wanted to increase accessibility and attract a younger target group. The Ludophobia company cooperated with students to develop a game which revolved around the vehicles present in the museum. Gamers can build virtual new cars by combining engine parts from cars in the museum. These can then be virtually tested on a race track created as part of the project. This actively involves visitors and that has a positive effect on the target group and visitor numbers.

Excellence programme
Avans Hogeschool has developed an Excellence programme on innovative imagery, digital media production and creative media application. For the first edition of the programme students were selected to work with film maker/director Sil van der Woerd on devising, making and producing a ‘music video’. In the process the students used new digital technology such as high-end animation techniques and motion capture.

Entrepreneurship
The second pillar of the VIVID project focused on the question, ‘How can graduates from the participating universities be helped to find a job in the city or to start up their own company?’ The aim was to create 50 jobs during the three years that the project ran.

The two incubators that were created have been successful: one in Turnhout (BE) and one in Cambridge (UK). Graduates have been supported with the setting up of their own companies or with finding jobs. In Cambridge a
total of 1,900 people participated. As yet no figures are available on the number of people who started a business. However, these figures are available for Turnhout. The SPK activities in setting up a physical incubator led to the creation of 10 jobs, while 3 businesses decided to merge to strengthen their position.

Furthermore approximately 2,200 people were advised on independent entrepreneurship or were helped to improve their chances on the job market. Jobs were created, even in these times of economic downturn. In Breda employment rose in the sector by 10% (>200 jobs) in 1 year, caused by, among other things, the Municipality of Breda fulfilling the role of first customer, as well as by a greater willingness among graduates to start for themselves. The expertise network of the Municipality of Breda and Huis voor Beeldcultuur has helped to create a network with the client business community and that has resulted in more cooperation.

**Showcasing**

Pillar 3 primarily revolves around organising large number of events and festivals (26) attracting a total of 160,000 visitors. The result was a renewed focus on the sector. The main objective of the activity was to exchange knowledge and experience. This met with less success and the partners could have achieved more. A positive exception was the cooperation between the Huis voor Beeldcultuur (NL) and Rencontres Audiovisuelles (FR).

**Conclusions and Reflection**

The activities generated a large number of interesting connections. Students worked on assignments for the business community. Heritage organisations have been given an opportunity, thanks to visual design, to boost visitor numbers and, as a result, change their earning model. The youth project gave young people an insight into the world of visual design. They now have a clear picture of how you cannot only use games and animations, but also build them. The intention is to arouse the interest of young people to opt for visual design courses in the city.

The project created jobs which would not have been realised without VIV-ID. The attention paid to visual design has increased substantially. The business community now understand that it can benefit from visual design applications. Three large Dutch businesses (VLD Steelweld, Scania and the Amphia Hospital) have set themselves up as ambassadors and this is helping a lot to raise awareness of the need for businesses to invest in visual design. The declaration of intent that is going to be signed by the partners indicates that there is a willingness to cooperate and an interest in maintaining the network.
SHIVA
Sculpture for Healthcare: Interaction and Virtual Art in 3D
For project partners see annex 1.

By: Dr. Leigh McLoughlin, Prof. Alexander Pasko and the SHIVA Project Team

It is well known that artistic activities can significantly help people to recover both physically and mentally after a wide range of traumas, as well as helping adults and children with physical disabilities to express themselves. However, using clay or any other sculpting material is non-trivial in a medical environment and especially for disabled individuals with little or no limb control, as well as a great many other practical issues such as hygiene, dust, equipment, storage, and so on.

In the SHIVA project, we proposed using ICT-based technologies to extend access to such artistic tools, within a fully protected environment, for particularly vulnerable population groups: people in rehabilitation (Lille and HOPALE) and children with various types of disabilities (Bournemouth University (BU) and Victoria Education Centre (VEC)).

Rehabilitation
From a clinical point of view, virtual sculpting activities have a broad range of advantages as a motor rehabilitation tool and as a cognitive rehabilitation tool. They are easier to implement in a medical setting, can offer activities to adult patients which are more in keeping with their age (currently used toys such as Meccano are often considered childish and boring) and can offer more engaging...
It is a well established fact that patient motivation is a key factor of successful rehabilitation.

**Artistic Expression for Disabled Children**

Young people with disabilities may have a very different experience of the physical world to those without such disabilities. This experience may be influenced by their range of movement, gross or fine motor skills, or by having spent their life in a wheelchair. Due to these physical difficulties, they may not have had the opportunity to explore the physical properties of different objects and materials in a conventional sense. The aim of the SHIVA project was to enable such young people to learn about manipulating objects by providing a few basic virtual sculpting tools and then producing the objects physically with 3D printing technologies.

**Virtual Sculpting and 3D Printing**

The project was designed to produce a small number of software exercises, specifically targeting the rehabilitation users at HOPALE and the disabled children at VEC, to allow them to produce virtual sculptures and then to 3D print the results. Some level of user supervision was assumed from the outset, and especially as 3D printing is a complex process, the outputs from the exercises would always need to be submitted to a technician for actual physical construction.

**Interaction**

To allow interaction with these software exercises by disabled users, appropriate interaction tools and strategies needed to be developed. Each user has potentially very different interface requirements which can also vary on a day-to-day basis. An interface solution must therefore provide flexibility and the ability to store settings for each user. In order to use a piece of software, the user must be able to interact with it. The physical limitations of disabled and rehabilitation users typically mean they cannot use a mouse and keyboard for interaction with software. Touch screens are becoming more mainstream and provide more input possibilities. Other important input modalities are eye-gaze tracking, gesture and varieties of switches.

**Results**

Academic activities and research results from the projects included conference, journal papers and presentations at national and international events. The primary outputs, however, were the software artefacts which were designed for the students at Victoria Education Centre and the patients at HOPALE Foundation:

**Accessible GUI System**

Usability and suitability for the users’ needs was key to the SHIVA project, so the BU team developed an accessible graphical user interface (GUI) in close collaboration with VEC. It underwent several cycles of refinement to meet the requirements of VEC’s

---

Eye gaze operation of the totem software
students. The SHIVA GUI system features are fully configurable in their on-screen arrangement and colours and there is support for multiple input types including touchscreen, switches and eye-gaze tracking. An assistive technologist identifies the user’s individual requirements and creates one or more user profiles for them which stores all of their settings. When the user wishes to interact with the software, their profile is loaded so that the system knows their exact interface requirements.

Metamorphosis Exercise
The first prototype software developed by BU in collaboration with VEC, and using their accessible GUI, was a metamorphosis exercise, specifically for younger or less cognitively able students. It involves the user choosing two objects and producing an intermediate shape that is blend between the two objects.

Totem Exercise
The second software prototype from BU was a ‘totem-pole’ exercise, which provides a more complex sculpting environment. Here, the user stacks a small number of objects together and then performs simple modelling operations on the stack such as blending, cutting, drilling and twisting.

Assembly Exercise
Lille produced a software prototype for HOPALE which would allow a user to assemble a pre-sliced object using 3D hand-tracking recognition. This also stored user performance information so that the clinicians could analyse a patient’s progress.

Conclusions and Reflection
This project clearly demonstrates how digital solutions are not only valid but provide the only real solution for such real-world applications, by providing access for users who would otherwise never have the opportunity to perform such tasks by themselves.

The ability of users to produce 3D printed artefacts with the project outcomes and other performance metrics was an immediate indication of technical success, but something that especially apparent was the high level of user engagement experienced. This came to light in the case of the disabled children of which a number became quite upset when they were told that their lessons had been rescheduled and that they would not be able to interact with the software that day.

This project highlighted the importance of the interface for disabled users and the technical challenges faced by developers in providing digital solutions for such a user base. The interface activities in the SHIVA project accounted for over 70% of the entire project efforts and were only possible through close team-working across project partners. This involved continuous feedback, at first from just experienced staff but, as the interfaces were refined, from actual users as well. The benefit of this user-involvement was a much more robust digital solution that was exactly suited to the user’s interaction requirements.

The project also highlighted a number of significant digital solutions which still need to be explored:

The SHIVA interfaces were significant but a great deal of work remains in order to allow a broader range of individuals to use the software through a broader set of input modalities e.g. brain-wave input and interpretation of emotion and physical intent.
Improvements in the modelling system, including GPU-based (graphics processing unit) rendering for improved real-time viewing of the virtual sculptures, more modelling features, as well as more fundamental questions related to the user interface and on how best to support a multi-modal modelling interaction paradigm. The direct connection of the modelling system to the 3D printing hardware is also a significant issue with wide-ranging consequences.
3i Unmanned Aircraft

Integrated Coastal Zone Management via Increased Situational Awareness through Innovations to Unmanned Aircraft Systems

For project partners see annex 1.

By: Stefan van Seters (REWIN Project Manager)

Organisations such as police and harbour masters monitor the movements and activities of ships in the Channel and southern North Sea. Although (manned) aircraft, radar and automatic buoys are currently deployed for this purpose, unmanned aircraft systems offer a cost-effective alternative for these systems. The 3i-project delivered a prototype of an unmanned aircraft vehicle (UAV) and contributes to the knowledge base on UAV and their application for maritime security. The results are of strategic value for the development of the whole maritime and 2Seas area.

The 3i project was divided into three phases. The first phase consisted of research and development, with the objective to derive the specifications for the prototype aircraft. In the second phase the prototype was assembled and tested. In the third phase a number of demonstrations were given. All this was done in a time span of two years.

The knowledge of unmanned aircraft in Europe is scattered between EU Member States. Maritime security organisations in The Channel and North Sea area are searching for more effective intelligence systems. So, for Europe to benefit from the global growth of new business in unmanned aircraft products and services collaboration, must be achieved between Member States.

Results

Intensive and active cross-border collaboration has been set up between the United Kingdom, France and the Netherlands. This has resulted in cross-border research and development regarding UAV, especially applications and technology.

A prototype UAV has been designed, built and tested.

The prototype aircraft, the 2Seas20, is a twin engine, twin boom monoplane. It has a mass of less than 20 kg excluding fuel and payload, and therefore qualifies as a small unmanned aircraft in this configuration. Two sensors are placed underneath the aircraft, namely a daylight sensor and an infra-red sensor. This can be used to track objects on the ground, while the aircraft is flying.

A van has been equipped as a mobile ground station from which both the aircraft and the camera can be controlled. The van is set up with 4 screens, two control links with the aircraft and a 3G connection to accommodate the pilot, the camera operator and the customer.

Opportunities for new projects have been explored with fire departments and within agriculture.

We have not yet reached the point where we can demonstrate the capabilities of the UAV to harbour authorities and police. This is mainly due to complex regulations.
Conclusions and Reflection

Possible threat: Regulations
Due to the rapidly increasing interest in ‘drones’ as a lot of people call them, the authorities foresee them becoming a danger. For that reason UAV operations are forbidden in most countries. With a lot of effort an exemption to this ban can be obtained after which flights are possible within a very limited framework. For this reason the 2seas20 aircraft has only flown in the UK, which is a few years ahead in terms of regulations. This threat is limiting most business with unmanned aircraft in the short term. It will take many years before regulations have caught up to the same level as current technology permits. However, the European parliament is aware of the problem and European regulations are expected to be introduced which will open up opportunities for UAV in the long term.

Close collaboration
From the start there was cooperation between SMEs, governments and educational institutions (triple helix). The 3i project was approached as one, cross-border, joint activity. This created a focus and delivered in-depth knowledge. It successfully
resulted in an operational UAV prototype. Another success factor was the complementary scope of supply, with no overlap in stakeholders’ expertise and skills. There was maximum cross-border cooperation due to many dependencies, with all partners being connected and active until the end. One notable feature was the flexible approach. When some partners faced problems (e.g. internal reorganisation, new regulations), other partners were able to take over tasks. There was a lot of enthusiasm about the possibility of developing a project in which partners with complementary knowledge are able to work on a single goal, that is defining, designing, building, operating and testing one joint prototype. Doing this joint project enabled us to develop a new European research cluster on UAV. The supply chain was optimised and suppliers and academics have acquired a better understanding of the needs of end-users.

Project management
If we were to do this project again we would invest more time in technical project management. We would maybe even involve at least one partner with in-depth knowledge of technical integration. More attention would also be paid to Quality Management by involving at least one partner with in-depth knowledge of end-user operations and the translation of functional requirements into technical solutions.
Many small and medium enterprises (SMEs) find doing business in another country a challenging prospect as there are various barriers (both perceived and real) and a range of additional requirements when trading in an international market. The 2 Seas Trade project was developed during 2010 to respond to the needs of SMEs in the different partner regions and to fill some gaps in the business support landscape for early-stage exporting.

The 2 Seas Trade project aimed to encourage SMEs to do business in a partner region by providing practical support to companies from England, Belgium and the Netherlands.

The 2 Seas Trade partnership was not selected by accident. All of the areas in the project provide great business opportunities for new or first-time exporters due to their proximity and excellent geographical connections via the Channel Tunnel and various ports. With similar business cultures, relatively affluent consumer markets and similar economic profiles, the partner areas offered real opportunities for SMEs. Whilst there was no formal French partner organisation in the project, the partners worked with several organisations in Nord-Pas de Calais to organise a range of activities focusing on activities in the French market.

**Sector Focus**

The project focused on providing support to SMEs in sectors which are all important in the main partner regions such as: Creative Industries, Transport & Logistics, Environmental Technology, Sustainable Construction and Food & Drink. The project also ran a specific event on the health & social care supply sector.

**Results**

The nine partners involved in the project worked together, and also called in external expertise to provide a range of market entry support services to help companies do business in one of the partner regions.

2 Seas Trade delivered the following activities:

- 40 Local business workshops on a range of international trade topics including international marketing, international website optimisation, international trade finance and do-
ing business in the different partner countries: 530 businesses participated.

- 199 one-to-one support visits from an international trade expert to companies to help them prepare for entering new markets.
- Joint stands at five international trade fairs to help businesses reach new international customers: 44 companies exhibited.
- 15 sector-focussed market visits and B2B networking events to bring companies from the partner regions together to make new contacts and collaborate: 300 companies participated.
- Advice & information for SMEs including four ‘doing business’ guides in three languages.
- An online international trade assessment tool.

Conclusions and Reflection

Many SMEs recognise that embracing and maximising the use of new technologies can play a key role in helping them access international markets. Throughout the 2 Seas Trade project, partners found that there is a real appetite among businesses to make better use of new technologies to help them enter new international markets. The following points highlight some of the applications of digital technologies that could help businesses to boost their international trade development activity:

Web-based market research
Companies can do a lot of work from their own offices as regards carrying out market research. This could help them identify whether there is a market for a product or service, examine market trends (& adapt!) and understand the requirements of potential customers among others.

Website Internationalisation
Companies can take steps to make their online presence visible in partner or international markets by adopting solutions like language specific pages to ensure visibility on global search engines, increasing business visibility in a target market (including through social media channels) and letting the website become a 24/7 global ‘shop window’.

Staying connected (despite the distance)
Companies can use video conferencing, instant messaging, social media and a whole range of mobile technologies to keep in contact with ‘in-market’ stakeholders. Doing business using digital technologies enables companies to keep travel costs to a minimum.

When travelling is unavoidable, mobile and remote working solutions can make companies more readily available to international customers in different time zones. Companies can also make use of facilities to give them a perceived physical presence in an international market through the use of country-specific URLs and dialling codes.

The project partners observed that many companies simply do not know where to start when it comes to international markets, in terms of being aware of the support available, which markets to focus on, or how to go about exploring opportunities in a new market. There did not seem to be a lot of support available in the partner regions for companies in the very early stages of their export journey. Consequently the 2 Seas Trade project aimed to address some of these gaps. The project focused particularly on companies that had made a decision to pursue overseas markets but needed some support to help them take the first steps. The strength of the project was the partnership based
on real contacts in the different partner regions. 2 Seas Trade enabled a large number of SMEs to make valuable connections in a new market.

Perhaps the most successful elements of the 2 Seas Trade project were the joint stands at international trade fairs. The partners worked incredibly well together to create an innovative concept which brought companies from each partner region together on a single joint stand. Not only were the stands themselves very visually attractive, the mix of companies from three countries and the excellent variety of products and services on offer made the 2 Seas Trade stands a unique and interesting proposition for visitors and potential business contacts at the events.
This survey was conducted in addition to the valorisation of the results of the 2 Seas projects to gain deeper insight into successful development of digital solutions. Each of the DigiSol partners surveyed part of the 2 Seas region. This resulted in a wide variety of 31 examples, ranging from very practical to very abstract, applications in retail, culture and education, applications which try to influence opinion and behaviour and applications which collect data for all kinds of purposes. Five of these best practices are made visible in short films. They are to be used as a tool to inspire and motivate other companies to implement digital solutions in their own company. They can be viewed at:
http://digisoleurope.eu
The full overview of the results can be downloaded via the link below.

**Trends**
The trends which the survey revealed are:

**Virtual meets physical:** The virtual domain (Internet) and the physical world are going to start having a mutual effect on each other. In retail, interactive information from the Internet is going to be displayed more and more often together with the physical product (BP4) or in maintenance where it will be possible to schedule physical maintenance work in a virtual 3D environment (BP13). (See also: 3, 5, 6, 14, 21)*.

**Internet-of-Things:** Devices will be linked more and more via the internet. This will make it easier to transfer information between devices and to collect system information. One example is the intelligent energy installation (BP2) and monitoring which enables patients to gain a greater insight into the medical situation (BP29). (See also: 6, 7, 21).

**Big Data:** The analysis of large and complex collections of information in order to identify patterns, to learn from them and to use them to develop new strategies. One example is the analysis of flows of people (BP1) and the storage in data vaults of all the data that a company generates (BP7). (See also: 2, 8, 9, 18).

**3D printing and 3D modelling:** 3D modelling software and 3D printers are turning rapid prototyping and mass customisation into a reality. The more extensive possibilities of the virtual world are being made material again. 3D presentations of reality are giving people a greater insight. Jewellery can be easily personalised by using 3D printed moulds (BP25) and 3D visualisations of the surroundings in which maintenance work has to take place will reduce time loss (BP13). (See also: 3, 9, 10, 14, 16, 20, 24).

**Visualisation information:** Companies are looking for ways to present

*) The numbers in this article refer to the best practices in the full overview of the survey:
information more transparently. The augmented reality application (BP3) and the visualisations of the seabed (BP9) are good examples of this. (See also: 1, 4, 6, 14, 16, 19, 20, 23, 24, 25).

Note: This trend partly overlaps with 3D modelling which is also used to increase insight.

Online marketplaces: Online marketplaces are being set up to bring together supply and demand. Good examples of this are the supply/demand platform for voluntary care (BP15) and the initiative to offer small and medium-sized enterprises a digital platform (BP30). (See also: 17, 22).

Clearly, a lot of these trends correspond with the trends in emerging and potential markets discussed earlier in this publication.

The motives

Economic motives: A hospital is able to make financial savings because e-learning reduces the number of hours lost because of employee absenteeism due to illness (BP22). An energy company tests several versions of a website simultaneously in order to get a clear view of which version generates the most sales (BP8). An analysis of flows of people can produce valuable insights into how people move around public spaces. These insights represent a value because they can result in cost savings or increased turnover (BP1).

Process optimisation: the scheduling of maintenance in a 3D model that reflects the actual situation leads to less downtime in the case of large chemical plants (BP13). Making all the activities that take place in a construction project visible prevents misunderstandings (BP14). In addition to the economic advantages of process optimisation, facilitating convenience is another important motive.

Facilitating convenience: citizens can get rapid answers from general practitioners to non-urgent medical questions via chat and care insurers are prepared to pay for facilitating this service (BP17). Residents can quickly find the nearest available bicycle in a city using a location-aware mobile app (BP6). Students learn more easily from games (BP16).

Link up with individual wishes: CAD and 3D print facilities mean products are more tailor-made and more in line with user wishes (BP10, 24, 25). An app for cleaners makes them more self-reliant (BP21).

Cultural heritage website

Accessing information: a website makes all archived information on the history of a town or city accessible to the public (BP23).

The visualisation of information to increase effectiveness: Presenting information, for example the personal budget, in the form of a visual story makes it more effective (BP19). Visualising abstract data, such as the seabed, can lead to new insights (BP9).

Generating new insights: by computer analysing enormous, complex datasets, which are too large for people to comprehend, the hope is that new patterns can be found which will provide new insights (BP7).
The approach
Projects passed off successfully if the development took place on the basis of close cooperation and dialogue between all the stakeholders, in a system approach. Cultural differences were quickly overcome, the possibility of misunderstandings was reduced and all the necessary information from the whole of the system was continually within reach.

Some best practices came about in cooperation with knowledge institutions such as universities. They make complex scientific information accessible which would otherwise be unavailable, or only available for large sums of money.

In the example of the cleaning company, bottom-up innovation was used. In other words, the most valuable information came from the people on the shop floor. This resulted in an extremely successful solution for all involved. It is still quite commonplace to develop digital solutions without users being involved in the process. The hospital that started to implement e-learning realised during the process that they had started without reflecting properly on the implementation procedure. Later, an extra time investment turned out to be required to ensure that the entire organisation linked up with the new developments. Employees were not used to learning via a computer and ICT facilities were not yet always up-to-date.

Conclusions and recommendations
The trends identified in the survey give cause for much enthusiasm. Physical retail will get an extra impulse because digital solutions will add an extra perception-related aspect. In healthcare digital solutions will provide support to the increasingly ageing population and the quality of life of patients. The analysis of complex and big data will provide insights which we have been unaware of to date.

Another point that has received insufficient attention is what happens with all (big) data generated by digital applications? More and more people are demanding transparency about what happens to the information collected. They are also indicating that they do not want to be monitored on the net by tracking cookies and believe that they should be the owner of their personal information.

How should we respond to these needs? This is an ethical question that has to feature in the development of any digital application.

Examinations of the majority of best practices revealed that the limits of an existing technology or way of working had already been achieved and that digital solutions offer opportunities for innovation.

The most important motive to develop digital solutions continues to be economic, in other words saving costs, increasing income and improving the competitive position.

In the case of the third of the projects the reason was socially motivated. A lot of those projects are supported by subsidies. However, some of these successfully combine social entrepreneurship with sustainable business operations.

If attention is paid to an intrinsic improvement in the perception by (end) users, the level of involvement is often substantial.

If you place all best practices alongside each other, you can create a clear process for the development of successful digital solutions. A step-by-step approach (see box) is also essential. Clarity about who you are as a company/organisation and what you represent is a condition for finding suitable solutions.

The setting up and maintenance of partnerships is an important process that runs parallel to the steps described above. The right partners reinforce each other by their expertise and skills. Because the same expertise and skills are not required in every phase, the connections are dynamic in many cases.

It is also becoming clear that involving the end user in the process often leads to a more suitable solution.

The discussions on best practices have revealed that the soft side of issues (the socio-creative process between people) is sometimes lost sight
of in the enthusiasm for technological development. Although the solutions are fine from a technical point of view, more attention needs to be paid to the human aspects of these kinds of development.

The case of the hospital that implemented e-learning to keep its employees up-to-date showed that it is a challenge to obtain an overview of the entire process when you are in the middle of it. External process experts may provide a solution as they are often able to bring a systematic, wider view to a project.

The future
What was noticeable is that almost everyone who was approached in the survey was enthusiastic about the possibilities of digital solutions. It transpired that some of the parties approached during in the survey used digital applications only sparsely, but were still interested. A few organisations appeared to be aware of the added value of interactive infographics and the analysis of all data generated by their company. Experience has shown that it is difficult for businesses to gain independently the necessary insight into the possibilities of digital applications. It is therefore important that institutions are created which actively propagate these possibilities and starts acting as matchmakers.

There is still too little cooperation between knowledge institutions and businesses. The challenge for the future is to do something about this. More details can be found further on in this publication.

Something that is missing from a number of best practices is the question of what the products generate for society as a whole. Usually this is the consequence of too narrow a focus in the analysis phase. Cross-sector cooperation may help to prevent a narrow focus.

The initiation of open innovation processes prevents solutions being excessively sought in the same field as that in which problems arose. This demands skill as regards working and learning together. Partner regions could facilitate this in future projects. It is also noticeable that very few best practices came about through transnational cooperation. If people cooperate in the same physical space, the returns are many times more effective and creative than when they work remotely.

Here too there is a role to be played by the DigiSol partners in stimulating the developments of digital solutions at a cross-border level in the future.

The steps which the partners can take during the coming years are:

- Combine collective intelligence by bringing together parties from different countries and sectors on the basis of key themes.
- Facilitate meetings and act as a knowledge broker with regard to digital applications.
- Start developing knowledge of interregional working and learning together in cooperation with external experts.
- Start measuring and highlighting the added value of cooperation and digital solutions in order to influence policymakers and subsidy providers.
The cleaning sector has been struggling for years with a substantial number of problems. It is difficult to get a good view of the work process followed by cleaners. The result has been a low level of confidence and consequently a lot of control and supervision. Staff are complaining about high pressure of work and poor pay. This has led to high levels of staff turnover and contracts are also coming under renewed pressure because customers want to pay less.

The cleaning company engaged the creative agency Freshheads (NL) and Somehow, a behaviour design bureau (NL) to devise an appropriate solution. The people at Somehow followed the cleaners during their work in order to obtain first-hand information from the shop floor. The solution, a digital ecosystem consisting of a smartphone and an online management tool offers a number of options:

- Each cleaner can sign on and off when cleaning a room by scanning a QR-Code and/or RFID. This offers an insight into cleaning times, work progress and the cleaner’s location.
- A cleaner can use the app (by taking a photo) to report rooms which are excessively dirty and which therefore took more time to clean. This provides an insight into speed of work and prevents unnecessary criticism.
- A cleaner can also order new cleaning agents himself when they are about to run out. The agents are supplemented the following morning and that prevents any delays and irritation.
- The employees can be contacted via their smartphones for ad hoc requests received from the company if, for example, a cup of coffee has been spilt. This increases...
customer satisfaction.

- The employees are allowed to use the smartphones for private purposes and this is greatly appreciated by staff. The employer has observed that this has led to employees taking specially good care of the telephones.

The results of this solution for the cleaning company, their employees and customers are without doubt considerable. Using modern digital solutions means the wishes of customers and employees can be fulfilled much more effectively. This has generated new contracts in a market which is undoubtedly under pressure. At the cleaning company fewer management hours are needed and that has generated cost savings. Levels of job satisfaction among employees is significantly higher because they have more confidence in their work, are more self-reliant and feel they are being taken seriously. Consequently, staff turnover has decreased. This is again generating a cost saving in the context of recruitment and selection.

This example shows that, although economic benefits can be regarded as significant, the benefits in general are much more extensive. For example, there are substantial gains to be made at the strategic, operational and human levels. This is down to a systemic approach to the problem. The entire system and all those involved have been analysed closely and been included in the development process.
**constamed.nl**

Constamed is an online medical platform on which certified and registered general practitioners (GP) in the Netherlands can answer non-urgent medical questions from patients. Constamed is therefore a response to the need to organise healthcare more efficiently. Patients can submit questions to their own GP, if he or she is registered, or to another certified GP. They can do so via a website or mobile app. The consultations are free because they are reimbursed by care insurers.

---

**ATEC-3D UAVs**

Atec-3D in Kent is specialised in the use of unmanned aerial vehicles (UAVs). The UAVs are used for, among other things, reconnaissance flights, to map areas and for aerial photography. The use of UAVs generates numerous advantages, of which cost saving is one of the most important. UAVs enable high buildings, such as church towers and bridges, to be inspected without people having to run significant risks. UAVs have also been used in Kent to monitor a dangerous tree disease. UAVs also make it a lot easier and cheaper to make 3D images for CAD models. UAVs are a lot less harmful to the environment and save time because they are operational more quickly.

---

**TAM3D**

Spie Nederland is a multi-technical service provider that offers, among other things, maintenance services to large (chemical) plants. These kinds of plants usually process hazardous substances on the basis of around-the-clock operations. This makes maintenance both complex and expensive. Significant cost savings could be achieved for customers by making 3D scans of these plants and by then creating 3D models from these scans which were then used in scheduling software. An added advantage is that the 3D representation provides a straightforward insight into the situation on site without someone actually having to go there.
**Sublimeeze**

Improveze is a French start-up which has brought the digital world closer to the physical one. Their product, Sublimeeze, is a transparent multi-touch shop window which can display information from the Internet alongside a physical product. This offers a number of benefits. A physical product can be displayed in a small space and can be ordered without a sales person having to be involved. The product specifications, as well as special offers, can be displayed alongside the product. Potential customers can submit their email addresses so that they can review the product at home on the Internet and then place an order.

**Fifth Play Smart Plugs**

Fifth Play makes smart electricity plugs which can be placed between electronic devices and a power socket. Every 15 minutes this plug provides user information to Fifth Play via the Internet. This generates a huge quantity of big data. Customers can indicate via a web interface what kind of device is connected to the plug: a washing machine or a fryer. The combination of use and type of device provides a considerable insight. Under the supervision of USG People, Fifth Play has started a process to examine how this data can be used both commercially and in the context of services. This process generated a number of ideas: Fifth Play can advise customers that they would save money by switching electricity supplier, or that the costs of purchasing a more economical washing machine can be recouped within one and a half years. Customers can also be sent a text message if they leave their deep fat fryer on for two hours or more. Due to the fact that the plug contains a switch which can be operated via the Internet, a customer can turn off the electricity remotely.

**Touch and eye gaze controls for children with physical disabilities**

Victoria Education Centre in Poole (UK) is a residential school for young people with physical disabilities and complex medical conditions. Quality of life is a major theme at the school. Digital means of communication have been developed to help children communicate more simply. Using touch and eye controls they can select and organise icons into sentences. The old way of doing this used to involve large illustrated cards and this was a slow and labour-intensive process. The new resources allow children to work more independently and also improves their quality of life.
What are the most important general digital themes in the four 2 Seas projects? In this chapter they are identified so that work can continue on them in the near future.

**3D printing and 3D modelling**

The 2 Seas projects and the digital solutions survey have revealed that 3D printing and 3D modelling is becoming hugely popular. The reasons why 3D visualisations (on a computer screen and/or physically) are so popular is that they enable people to observe objects or spaces in a way which is close to reality. In addition, 3D visualisations allow prototypes and new goods to be produced relatively simply, quickly and cheaply and that enables designers to create items corresponding to the wishes of clients which can be easily adjusted whenever necessary. The software-related possibilities are also broader because virtual spaces are not subject to the laws of physics, such as gravity. The enormous computational capacity of modern computers also makes it possible to visualise complex shapes which would take weeks to create from wood or clay.

**Weaknesses**

The general availability of 3D printing technology is still quite limited. Professional equipment is too expensive for small and medium-size enterprises. A ‘Do It Yourself’ construction kit, like the UltiMaker (https://www.ultimaker.com) is more affordable, but requires a great deal of technical insight to make it operational. In order to make 3D prints, you need to know something about 3D modelling (CAD). This is specialist and rel-
One of the reasons given is concerns about intellectual property. In addition, some businesses find it difficult to adjust to the Do It Yourself image of some of the labs. On the one hand, the FabLabs will have to become more professional and, on the other hand, businesses will have to adopt a more open (innovation) attitude. It will no longer be possible to have the production process take place in a fully independent, controlled environment. As far as software developers are concerned the developments in the field of 3D offer opportunities to design user interfaces for 3D software which are intuitive enough to allow less technically astute users to achieve satisfying results.

In the market we are seeing more and more businesses offering ready-made 3D models for printing. Companies such as ShapeWays are offering a market place for their own 3D models and those of users where ordered models are printed and then despatched by post.

3D printing offers countless possibilities and the continual development of new printing materials will, at some point in time, mean that we can have our own custom-made sports shoes produced using 3D printing.
‘Mobile first’ is the latest paradigm and means giving priority to the development of applications for smartphones and tablets. The DigiSol Survey revealed a huge number of mobile applications, and apps were also developed during the 2 Seas projects. The expectation is that, if the 2 Seas projects were to be applied for right now, the number of apps would be even higher.

Mobile applications have a number of unique benefits compared to software packages on computers:
- They are portable and therefore available any time and any place.
- They know when and where you are and can therefore link information to location and time.
- They have access to a smartphone’s motion sensors.
- They can be operated with fingers, gestures and speech.

**Weaknesses**
Everyone wants an app. The greengrocer on the corner, the local yoga club and the firm of accountants down the street. This is given the app development market a huge boost. It should be noted, however, that the various app stores are full of apps which are not much more than a copy of the website or a digital business card. In order to create true added value with an app, it is sensible to focus on the user and to investigate which functionalities actually create added value for a user on a mobile platform.

**Opportunities**
Mobile applications create a new contact point/moment with users and cus-
customers, one which is always close by and can draw attention by means of notifications.
iBeacons and NFC (Near Field Computing) technology, which enable short distance information exchanges between smartphone and another system, make it possible to provide shoppers with information and special offers which are relevant to them at that point in time and at that specific location.
For maintenance work, apps offer the possibility of always having up-to-date and accurate information to hand. Information on maintenance performed by several people at the same time can be updated in real time and this means errors and misunderstandings can be avoided.
It may also be interesting to use tablets as mobile control systems for drones. The intuitive use of tablets makes the operation of UAVs more user-friendly and, consequently, enables wider use of UAV technology.
The latest developments in the field of healthcare make it possible to use smart watches and sensors to monitor and register all kinds of vital bodily functions. Coupled with tablets and smartphones, these devices will offer the chance to acquire a better insight into your physical well-being and state of health. They also offer the possibility of making health data available via Internet to your general practitioner or specialist. In the coming years there will be enormous market potential for the development of apps that use and analyse this medical data.

Start with the user
In order to make the most of opportunities for the development of digital solutions, it is best to start with people, the users, that is employees, employers, customers, parents, children, teachers, students, etc. What problems do these groups come across during their professional work and in their spare time for which they would like to find a solution? Can any (potential) needs be identified in these groups? Can activities and processes be carried out more cheaply, simply, quickly and in a more environmentally and people friendly way? By linking to these kinds of questions, a digital solution will be relevant and not get stuck at the level of a gadget or gimmick. After all, those are only popular for a short period of time and are then quickly lost from sight because they do not generate any real added value.
Visualised information

YouTube has created an era in which stories are told using images. It is almost no longer acceptable for organisations not to use a film or animation if they want to explain the complex story.

Online it is clear that previously textual websites are becoming more and more visual. One example is the website of The New York Times where complex data is presented easily and accessibly using interactive infographics. The NYT can now make long stories more interesting by using visual storytelling techniques.

The popularity of smartphones and tablets and touch controls have increased awareness about user interfaces. They have to be operated intuitively and only show information which is relevant to users at a certain point in time.

Visualised (interactive) information is featured repeatedly in the 2 Seas projects. The digital solutions survey also included several cases of information being visualised smartly.

Weaknesses

Experience (gleaned from conversations during the survey) has shown that a substantial group of entrepreneurs is unaware about the impact that interactive infographics, animations, user interface design and visual storytelling can have on their business operations.

Some of the entrepreneurs in question are familiar with communication and marketing agencies (in connection with advertising campaigns and business communication) but less so with multimedia and information designers and film makers, that is the
group of creatives with expertise in the translating and structuring of complex information in images and visual storytelling.

**Opportunities**
Because the smart visualisation of information takes time and money, usually more so than writing a piece of text, some large design businesses have carried out income/expenditure analyses of their work. This enables them to demonstrate what their work can generate for their clients. For smaller businesses and individuals this is often unknown territory and difficult to implement because they do not have the necessary resources. Neither is it simple to quantify design on the basis of yield.

In a follow-up to the DigiSol project, it may be useful to carry out research or have research carried out into the income/expenditure of various sorts of information visualisation and digital solutions.

One example from the DigiSol survey is very revealing as regards the effectiveness of visual storytelling. ‘Peter’s story’ is about a Dutch boy with a serious disability. He receives a personal budget of €74,412 per year to help him cope with his disabilities. In response to the question of whether he is worth it, 56% answer ‘yes’ without having seen the visual story. After seeing the visual story, this percentage rose to 90%. 

---

**Some great examples**

**Interactive Infographics**
Clubs that connect the World Cup
http://j.mp/connectedclubs

Future of Car sharing
http://j.mp/futureofcarsharing

**Animation**
It’s time for real
http://j.mp/importvsexport

**Changing Education Paradigms**
http://j.mp/eduparadigm

**Visual Storytelling**
A Game of Shark and Minnow
http://j.mp/sharkminnow

Firestorm: The story of the bushfire at Dunalley
http://j.mp/firestormbushfire
The collaboration process was an important theme during the 2 Seas projects and the DigiSol cluster project. It featured in almost every report and meeting.

Within the framework of this theme, this chapter assesses the question, ‘What are the preconditions for a successful development of digital solutions?’. The cooperation between knowledge institutions and businesses is also dealt with because the partners believe it can be improved. Lastly, there is an explanation of the role that knowledge centres can play, and the importance of collective intelligence and open innovation is emphasised for the further development of digital solutions.

**Preconditions for successful digital solutions**

The effective development of digital solutions requires mutual knowledge and clear agreements on cooperation. Although this process demands time and attention at the beginning of a project, it saves a huge amount of time later on.

Digital solutions are generally complex in nature and are developed by multidisciplinary teams. Becoming familiar with each other’s disciplines by showing examples and discussing options is an important part of a successful development process.

One of the partners emphasised that meeting for a day is not long enough to create a joint culture. That would require the partners to spend more time together. Only then will the partners get to know each other well and will a culture be created which is suitable for idea creation.

Finding a good balance between expectations and needs of the various parties involved is also a key consideration. This is important because, although research and development projects for digital solutions are dynamic and unpredictable in nature, concrete results still have to be achieved.

One of the partners emphasised that it is important to involve the end user in the process at an early stage. More and more frequently, developers of digital solutions start thinking for and about the user without involving the user in the process. Involving the end user at an early stage will create the greatest chance of the solution linking up with user needs and wishes.
Cooperation between knowledge institutions and businesses

One of the conclusions of the DigiSol cluster project is that the cooperation between knowledge institutions and businesses could become more intense, of a higher quality and more equal. Close cooperation offers opportunities to stimulate digital innovation in businesses and keep training relevant. During a workshop in Kent, the partners conducted a panel discussion on this issue. The following are the most important findings from this discussion, from the 2 Seas projects and from partner expertise.

Reciprocity
Some businesses see students as cheap labour. In such cases, this primarily serves the interest of the business but contributes little to a quality relationship between the business and the knowledge institution. When both start cooperating more effectively, this generates an added value which is much greater than purely economic. It creates mutual familiarity and, with that, a better match between education and the labour market. Inviting representatives from industry to speak as visiting lecturers and work as mentors ensures that expertise from the field of work is continuously available at the knowledge institutions.

Research and innovation processes
Conducting research and completing innovation processes together also helps to build a solid relationship. For very small and medium-sized businesses, having to engage a professional research agency to do the research is too expensive. For knowledge institutions, it offers the possibility of working on real issues from professional practice. Because education is financed with public money, the results of research will have to be publicly accessible. Some businesses might view this as an obstacle from the point of view of competition.

The Technology Strategy Board (UK) has sponsored knowledge sharing and innovation projects in order to stimulate cooperation between industry and universities. By doing so they create opportunities for the business community and knowledge institutions for collaborating in innovation processes.

A direct line is sometimes difficult
One of the companies interviewed indicated that it is sometimes difficult for small and medium-size enterprises to develop direct contacts with knowledge institutions. There are a number of reasons for this: The length of courses is an issue which is under a lot of pressure in many countries and students are having to graduate within a short space of time. For that reason, the education is structured in an efficient and effective way and there is then little time left for ad hoc questions from the business community.

Design courses at art schools have made little effort in recent decades to build up a relationship with the business community and industry. The focus has been primarily on cultural and autonomous productions. In recent years this situation appears to have been changing. It also has to be said that the technical business community and industry in particular have turned out to be unable to respond properly to the creativity generated by these institutions.
Organisational
Education is generally organised into blocks or terms. As a result, students are often not available throughout the year to fulfil requests from the business community.
For some innovation-oriented institutions, the high number of requests they receive also means that they would pretty much have to become a company full-time in order to meet them all. That also leads to reticence.

Traineeships
At some training institutions, students are only allowed to do traineeships at businesses actively engaged in the student’s specialist field because, otherwise, there would be insufficient supervision during the traineeship. While large businesses frequently have a specific department that focuses on the institution’s specialist field, at smaller businesses this is often not the case.
In the context of graduation or post-graduate projects, students can generally operate more autonomously because they are operating at the same level as a new employee in the professional field in question.
It also transpired that some businesses do not offer students traineeships because they do not believe they are ready for the work environment. These kinds of businesses could offer alternative research avenues or design competitions as a way of maintaining the relationship with the knowledge institutions. This would enable students to develop both their CVs and their relationship with the business community.

Adaptivity is a condition for success
It was indicated that it is important for schools to focus not only on technical skills but also on the development of critical thought and adaptivity in order to ensure that graduates are sufficiently capable of adapting to continuously changing market demand. This is a precondition for success, particularly in such a rapidly changing market as that of digital solutions.
One of the start-ups that took part in the discussion emphasised how important it is that knowledge institutions train students to think ‘outside the box’, give them translatable skills, a problem-solving capacity and a creative ability.

Graduates offer new opportunities for businesses
It was also emphasised that recruiting graduates to fulfil a specific technological role could represent a unique opportunity for businesses. It provides a basis from which the business can encourage and accelerate the implementation of new technologies. Experience has taught us that, for certain types of students, this is indeed the case. The Communication & Multimedia Design (NL/BE) domain produces higher professional education (HBO) graduates who have an understanding of technology, design and communication. Within businesses they play a pivotal role and, as we have seen, the consequence is that the companies that employ them are quicker to embrace and implement new technologies.
Knowledge centres, collective intelligence and open innovation

Knowledge centres

The results of the DigiSol Survey primarily revealed that it is important that new knowledge centres actively embrace the benefits and possibilities offered by digital solutions. This is because it is apparently difficult for some (small and medium-sized) businesses to acquire the necessary oversight themselves into what innovative digital solutions might imply for their organisation.

These knowledge centres, preferably a network of knowledge centres in the 2 Seas regions, proactively bring best practices and new developments to the attention of interested parties. This can happen by means of conferences and exhibitions, but also by acting as knowledge broker to ensure active use of the possibilities and opportunities offered.

During the VIVID project the Municipality of Breda worked on the setting up of a knowledge centre for visual design. In the course of that process it became clear that each of the parties involved (government, knowledge institutions, businesses) had its own idea about what a knowledge centre should be. Consequently, there were differing ambitions. When setting up a knowledge centre it will first have to be clear what the parties want to achieve and what kind of effort they are willing and able to make. It is advisable, therefore, to begin cautiously and not refer to such an initiative immediately as a centre of expertise. That title is something the institution will have to earn in time.

Another key conclusion was that it might have been better for the municipality not to fulfil a leading, but rather a facilitating, role. The fact that no content-related expertise was available relating to the theme of visual design made it difficult to determine the direction.

Knowledge centres come under regular criticism, and possibly with good reason. They are sometimes referred to as subsidy black holes that are insufficiently able to demonstrate their usefulness and effectiveness. Active and high-quality knowledge centres arise as a result of broad involvement by businesses, authorities and knowledge institutions. These parties are also responsible and contribute financially. This prevents a situation in which knowledge centres become separated from commercial reality and from there usefulness for society.

Collective intelligence and open innovation

One of the meetings organised during this project revealed the importance of collective intelligence and collaborative thinking to stimulate innovation, at both local and global levels.

This realisation has been echoed at some larger businesses in recent years. Whereas innovation used to take place behind closed doors (in order to protect intellectual property) in recent years a more open attitude has been adopted when working on promising themes.

Knowledge centres (and certainly a network of knowledge centres) can fulfil a facilitating role in innovation processes. They can organise local and international meetings at which a varied group of stakeholders can collaborate and learn about relevant themes. These themes may include maintenance, big data and eHealth. Innovative power can also be used for socially-oriented themes such as ‘how digital applications can help in the context of an increasingly ageing population’.

An important element of an open innovation way of working is that results actually become freely available to everyone who participated in the process. No ownership exists with regard to the ideas being developed. Although this appears to be a risk, it actually increases the chance of these ideas being acted on. After all, the chance of different parties turning an idea into one and the same solution is minimal.

With a view to turning ideas into a reality, an open innovation process can be followed by the setting up of alliances.

The initiative for activating collective intelligence is, of course, not the sole prerogative of knowledge centres. It would be ‘good practice’ if businesses, knowledge institutions, authorities work jointly on innovative themes.
Cross-border cooperation in the future

Cross-border cooperation is necessary in the context of developing and applying new digital solutions in the 2 Seas region if areas are to become global centres of excellence in various commercial sectors. However, cross-border cooperation does not happen by itself and, in the field of digital applications, it is perhaps even trickier than in traditional sectors of business. A number of recommendations have already been made in the previous chapter in relation to cooperation on the latter point. This chapter examines, more specifically, cross-border cooperation in 2 Seas projects in recent years, the synergy achieved in this cluster and future prospects.

Differences in cooperation in the 2 Seas projects

In this cluster it transpired that 2 Seas projects can be very different in terms of structure, size and method of cooperation. The most extreme example is the difference between 3i and VIVID. In the 3i project, SME, knowledge institutions and authorities worked together on a single, cross-border, joint activity. They indicate that this strong focus helps them to set up a new European research cluster in relation to UAV.

By contrast, the VIVID project consisted of a wide range of different activities. However, no fewer than 25 projects were executed by the project partners. Although some of those projects involved international cooperation, other activities were tackled by the partners locally and individually. Although this did result in intensive and probably long-term partnerships within specific subgroups, the same cannot be said for the group as a whole. The lesson that can be learned from this is that intensive international cooperation comes about
primarily during projects and activities which have a clear focus.

In the DigiSol cluster initiative the partnership was created on the basis of a good mix of partners from education and partners who play a role in regional economic development. Of course, other important factors were geographical spread and being active in the field of digital applications. The cooperation in this cluster was primarily shaped by the exchange of knowledge regarding the results of various 2 Seas projects and the execution of an international survey. On the one hand, these joint activities led to key conclusions being drawn with regard to relevant digital developments and, on the other hand, to potentially new partnerships to tackle the various digital themes in more detail. Consequently it is becoming clear in this context as well that a strong focus by the cluster leads to concrete results.

**Recommendations**

Besides the above-mentioned recommendation for cross-border cooperation, the cluster partners also made other suggestions based on their experiences, such as:

- Set up a group of international partners who complement each other and who need each other to make the project a success.
- In the project initiation phase organise work sessions in which potential partners together define international projects. This phase is extremely important and may require more attention than has been the case up to now. During this phase an indication of which international partners are cooperating, how cooperation is going to take place and which transnational added value is going to be created.
- In addition, proper coordination and agreement are necessary with regard to project communication. One complaint made about meetings is that a lot of information is presented and that there is little time for cooperation. The question is how time will be used when the partners meet? What information is relevant at that moment? What information can be laid down in writing? What will the partners work on when they are together? Should they work with the group as a whole or would it be more effective to work in subgroups?
- Physically meeting is and continues to be necessary to ensure the projects progress well (of course sometimes a Skype conversation will suffice). Even when travel times and costs are taken into account, the advantages of a physical meeting more than outweigh the disadvantages.
- Cooperation is a skill you can learn. It may be a good idea to use process experts who understand how to cooperate effectively.

**Cross-border added value of the cluster**

DigiSol is a project in which different education institutions and (regional) development organisations from various countries collaborate in order to increase the use of creative digital solutions in various sectors and with that the opportunities for development. The diverse composition and the activities that have been carried out (workshops, knowledge sharing on 2 Seas projects, survey and event) have clarified the most important digital themes in the 2 Seas region, how complicated the cooperation is between authorities, knowledge institutions and businesses in this field, and which corporate sectors offer interesting opportunities for cooperation and the use of new digital applications. Without this varied and cross-border partnership composition, it would not have been possible to identify precisely those bottlenecks and opportunities, themes and sectors.

**The synergy achieved and future possibilities**

The synergy achieved in this cluster is that partners have jointly (on the basis of the first results) referred to a number of key digital themes and sectors to which more content can be given in the future. In addition, it is possible, precisely because of the diversity within the partnership, to specify and develop activities within the framework of these themes and sectors which would otherwise have been impossible. A good example of this is the use of big data analysis, visualisation and storytelling to reinforce city centre retail. An activity like this requires cooperation (as is also
present in this cluster) from various expertises in the field of digital applications. However, the cooperation of regional development institutions, authorities and businesses is also required. They have to facilitate data collection and create a test environment to make the new digital applications effective and visible. Another example concerns the introduction of 3D printing in traditional manufacturing industries. Development institutions and authorities are looking, within their regions, for a distinctive corporate sector that is willing to get involved. The knowledge institutions then clarify the possibilities of 3-D printing to the members of that sector. In doing so they use visualisations and storytelling.

The cluster partners believe there are lots of new opportunities and possibilities in the field of digital applications and are going to highlight these in actual projects. From there they will create new partnerships and start developing and executing larger cross-border partnership projects in relation to the deliberately named 'DigiSol themes'. The DigiSol partners therefore believe there are plenty of opportunities for the future, not only with regard to the two examples referred to but also in the field of digital applications in the home care sector and the commercial use of drones. If you share their belief in those opportunities and would like to participate, you are more than welcome to do so.
ANNEX 1 Interreg 2 Seas project partners

VIVID [www.vivideurope.net]

[Logos of various partners]

SHIVA [www.appliedshapes.com/research/shiva]

[Logos of various partners]

3i Unmanned Aircrafts [www.2seas-uav.com and j.mp/3iuav_coverage]

[Logos of various partners]

2 Seas Trade [www.2seastrade.eu]

[Logos of various partners]
ANNEX 2  Photo and illustration credits

<table>
<thead>
<tr>
<th>page</th>
<th>illustration/photo</th>
<th>credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>'Tree'</td>
<td>VLADGRIN (Shutterstock, edited by Jan Peeters)</td>
</tr>
<tr>
<td>5</td>
<td>Europe</td>
<td>Katsiaryna Andronchyk (Shutterstock)</td>
</tr>
<tr>
<td>8</td>
<td>'Patterns in text'</td>
<td>Wordle (wordle.net)</td>
</tr>
<tr>
<td>9</td>
<td>'Tree diagram' export</td>
<td>The Observatory of Economic Complexity by Alexander Simoes (atlas.media.mit.edu)</td>
</tr>
<tr>
<td>9</td>
<td>'Augmented reality'</td>
<td>Dr. Michael Mueller (Division of Medical and Biological Informatics, German Cancer Research Center, DKFZ, Heidelberg) and Prof. Dr. Jens Rassweiler, Head of the Urological Department, SLK Kliniken Heilbronn, Germany (mbits.info/surgerypad.php)</td>
</tr>
<tr>
<td>10</td>
<td>'Watch concept'</td>
<td>Todd Hammitton (toddham.com)</td>
</tr>
<tr>
<td>12</td>
<td>'Anim 2.0'</td>
<td>Chragokyberneticks (chky.ch)</td>
</tr>
<tr>
<td>13</td>
<td>'Beaulieu racer game'</td>
<td>Les Rencontres Audiovisuelles (rencontres-audiovisuelles.org)</td>
</tr>
<tr>
<td>13</td>
<td>'Fête de l’anim'</td>
<td>National Motor Museum Trust in collaboration with Ludophobia</td>
</tr>
<tr>
<td>14-17</td>
<td>User interface of software</td>
<td>SHIVA team at Bournemouth University</td>
</tr>
<tr>
<td></td>
<td>3D printer</td>
<td>Leigh McLoughlin</td>
</tr>
<tr>
<td></td>
<td>All other images</td>
<td>Frederik Duerinck</td>
</tr>
<tr>
<td>18</td>
<td>UAV in air</td>
<td>M. Ferraro, University of Southampton</td>
</tr>
<tr>
<td>19</td>
<td>'Parts were 3D printed'</td>
<td>3T rpd (3trpd.co.uk)</td>
</tr>
<tr>
<td></td>
<td>3D printed parts on desk</td>
<td>M. Ferraro, University of Southampton</td>
</tr>
<tr>
<td></td>
<td>3D render of UAV</td>
<td>M. Ferraro/A. Lock/M. Erbil, University of Southampton</td>
</tr>
<tr>
<td>20</td>
<td>Infographics sensors</td>
<td>T. Mannucci, TU Delft</td>
</tr>
<tr>
<td>24</td>
<td>'Van'</td>
<td>Van Strien reclame (vanstrien.nl)</td>
</tr>
<tr>
<td>25</td>
<td>'Heat map'</td>
<td>Anaxa-Vida (anaxa-vida.com)</td>
</tr>
<tr>
<td>26</td>
<td>'Heart jewellery'</td>
<td>Leigh McLoughlin (appliedshapes.com)</td>
</tr>
<tr>
<td>28-29</td>
<td>'Illy'</td>
<td>Vebego/Hago Next (hagonext.nl) and Frederik Duerinck</td>
</tr>
<tr>
<td>30</td>
<td>'ATEC-3D UAV'</td>
<td>ATEC-3D (atec-3d.com), from a movie by Frederik Duerinck</td>
</tr>
<tr>
<td>30</td>
<td>'constamed.nl'</td>
<td>Constatmed.nl, from a movie by Frederik Duerinck</td>
</tr>
<tr>
<td>30</td>
<td>'TAM3D'</td>
<td>Spiel Nederland (<a href="http://www.spie.nl/en">www.spie.nl/en</a>)</td>
</tr>
<tr>
<td>31</td>
<td>'Sublimeez'</td>
<td>Improveeze (improveeze.com)</td>
</tr>
<tr>
<td>32</td>
<td>'Smart plug'</td>
<td>Fifth Play (fifthplay.com), from a movie by Frederik Duerinck</td>
</tr>
<tr>
<td>32</td>
<td>'3D bracelet'</td>
<td>Formlabs (formlabs.com) and Nervous System (n-e-r-v-o-u-s.com)</td>
</tr>
<tr>
<td>33</td>
<td>'Ulltmaker'</td>
<td>ultimaker.com</td>
</tr>
<tr>
<td>34</td>
<td>'Bottle carrier'</td>
<td>Design Charlotte Jansen, printed at Fablab Breda (NL) (fablabbreda.nl)</td>
</tr>
<tr>
<td>34</td>
<td>'Penholder'</td>
<td>Design by Hrvoje Cop (shopmeister.blogspot.com), printed at Fablab Breda (NL)</td>
</tr>
<tr>
<td>34</td>
<td>'Student workshop in Fablab'</td>
<td>Fablab Barcelona, The Institute for Advanced Architecture of Catalonia (iaac.net)</td>
</tr>
<tr>
<td>35</td>
<td>'Arms with mobiles'</td>
<td>PureSolution (Shutterstock)</td>
</tr>
<tr>
<td>35</td>
<td>'Mobile health application'</td>
<td>Apple Inc. (apple.com)</td>
</tr>
<tr>
<td>36</td>
<td>'13 reasons infographics'</td>
<td>NeoMam Studios (neomam.com)</td>
</tr>
<tr>
<td>36</td>
<td>'Open government diagram'</td>
<td>Armel le Coz and Cyril Lage</td>
</tr>
<tr>
<td>37</td>
<td>'The Crisis of Credit'</td>
<td>Jonathan Jarvis (jonathanjarvis.com)</td>
</tr>
<tr>
<td>37</td>
<td>'Lamp'</td>
<td>Pongsuwan (Shutterstock)</td>
</tr>
<tr>
<td>38</td>
<td>'Brains Eden Festival'</td>
<td>Brains Eden Festival (brainseden.net)</td>
</tr>
<tr>
<td>41</td>
<td>'Hands'</td>
<td>tandaV (Shutterstock)</td>
</tr>
<tr>
<td>42</td>
<td>'Meeting'</td>
<td>Rawpixel (Shutterstock)</td>
</tr>
<tr>
<td>43</td>
<td>'Hands'</td>
<td>tandaV (Shutterstock)</td>
</tr>
</tbody>
</table>
Managing Editor: Véronique Weyland-Ammeux, Director of the INTERREG IV A 2 Seas Programme.

Authors and contributors: Kees Kerstens, Leigh McLoughlin, Alexander Pasko, Stefan van Seters, Steve Samson, Wim van Hooff, Jan Peeters.

Editing and lay-out: Jan Peeters

Editorial support: Clementine Simons

Translations: Vertaalburo Van Twist

This issue is produced in the framework of the Cluster works, and coordinated by the INTERREG IV A 2 Seas Programme.

This cluster is led by the Municipality of Breda, The Netherlands. The cluster partnership also gathers Avans University of Applied Sciences (NL), Kent County Council (UK), Bournemouth University (UK), REWIN West-Brabant (NL) Sint Lucas Antwerp | Karel de Grote-University (BE).

The contents of the publication reflect its authors’ view and do not necessarily reflect the opinions of the institutions of the European Union. The text in this publication is for information purposes only and is not legally binding. This publication is entirely financed by the European Regional Development Fund (ERDF) through the INTERREG IV A 2 Seas Crossborder Programme.
The Interreg 2 Seas Programme is an EU funding programme which promotes crossborder co-operation between partners from France, England, Belgium (Flanders) and The Netherlands. It aims to develop the competitiveness and the sustainable growth potential of maritime and non-maritime issues through the establishment and development of cross border partnerships.

For further information on the DigiSol cluster visit: www.digisoleurope.eu

For further information on the 2 Seas Programme, please visit: www.interreg4a-2mers.eu