



IGS

INSTITUTE FOR INNOVATION
AND GOVERNANCE STUDIES

**INSTITUTE FOR
INNOVATION AND
GOVERNANCE STUDIES**
UPDATE 2012

UNIVERSITY OF TWENTE.

INSTITUTE FOR INNOVATION AND GOVERNANCE STUDIES

The University of Twente is one of the youngest universities in the Netherlands. Since its foundation in 1961, it has truly made its mark with applied scientific research and education in technology and society. Boasting many fields of research enables the University of Twente to seek connections between innovation and (theory) development. Connections directly related to practice as well as to market and societal demands. To this end, cutting-edge research in both a national and international context is concentrated in four institutes active in the fields of bio- and nanotechnology, ICT and governance. The social relevance of this research is refined further in the profiles health, safety, water, energy and sustainability.



The Institute for Innovation and Governance Studies (IGS) clusters social and behavioural scientific research according to an innovation and governance perspective. Issues of these core disciplines are frequently related to the technological research conducted at the University of Twente. This not only contextualizes technology but it also affords a unique research profile in which social and technological innovations interact. The institute is thus active in the area that may well be the greatest challenge for the Netherlands and Europe: how do we become a knowledge-based economy? How does it function? And how can it best be organized?

Research at the IGS is accommodated in five strategic research orientations (SROs). With academics from different disciplines and departments collaborating closely within each SRO, joint projects are common and doctoral students receive tuition in all areas. Each SRO has its own programme leader who manages and coordinates all of its activities. The scope of the five SROs is as follows:

- Governance of Innovation, Technology, Higher Education and Research not only addresses the knowledge interactions between the university, research institute and industry with regard to developing technologies, higher education and public research policy, but also the developing research regimes of universities, companies and government.
- Management of Innovation and Entrepreneurship focuses on industrial and entrepreneurial innovation in relation to high-grade technology in an international context.
- Innovation of Governance examines the changing relationship between government and the public within various administrative strata, with particular attention to multi-level governance as regards legitimacy and effectiveness.
- Sustainable water, energy and spatial governance looks at possible ways to sustainably manage natural resources and the environment, and the policies required to do so. A central theme here is a community's response to new problems and risks in relation to technological solutions and policy measures.
- Health Assessment & Promotion has a strong design-oriented character and aims to devise new, innovational interventions and solutions to improve people's health and health care in general.

IGS: INSTITUTE FOR INNOVATION AND GOVERNANCE STUDIES

The IGS was established in 2005. Its aim: to study topical issues of a social, technological and scientific nature from a governance perspective. In just over five years, our research institute, to which more than 300 scientists were affiliated in 2011, has established a prominent name for itself.

Modern society is influenced by constant threats in areas like the economy, health and security, pollution and shortage of raw materials. On the other hand, knowledge, technology and innovation pave the way for inspirational opportunities. Within this dynamic, the interaction between citizens, governments, employees and unions plays a decisive role. In a world which is becoming increasingly complex, their interests are intertwined just as much as they are in conflict. For all of these stakeholders it is no longer possible to direct, govern and operate independently of one another. Governance addresses these changing roles and positions of governing bodies and corporations, citizens and unions in modern society. Innovation is the expression of progressive change.

MANAGING COLLABORATION AND INNOVATION

The IGS provides high-quality research with a strong focus on innovative solutions. What distinguishes us is our systematic choice for an interdisciplinary approach in all our research programmes. This, combined with the expertise of the large number of researchers plus our connections with the cutting-edge technological research at the University of Twente, makes us absolutely unique. Moreover, it often leads to unexpected analyses, provocative recommendations and striking research results, which at the same time appear to resonate strongly in the real world.

Research orientations

The IGS is primarily a social sciences research institute but one with the express task of building a bridge between the technical sciences and social sciences in which the University of Twente excels. This research is facilitated by and performed within the framework of five broad strategic research orientations (SROs): 'Governance of Innovation, Technology, Higher Education and Research', 'Management of Innovation and Entrepreneurship', 'Innovation of Governance', 'Health Assessment & Promotion' and 'Sustainable Water, Energy and Spatial Governance'. These

enable us to help actors steer collaboration and innovation.

Innovation

Our research orientations link up with themes in which innovative ability is the defining indicator for the success or failure of global society. With its knowledge and expertise, the IGS is able to pinpoint what is required to ensure that potential innovations lead successfully to actual renewal and broad application. These are often innovations which are supported by technology. To this end, the University of Twente has many in-house disciplines, ranging from construction, civil engineering and technology and water management to biomedical and nanotechnology. In order to ensure the social and economic success of the subsequent innovations, the IGS studies the social scientific conditions. With the global interests of markets or states possibly standing in the way of pioneering innovations, the IGS addresses the consequences of technological innovations and their success potential.

Core activities

In order to pave the way for innovations, also those of a social nature have a place in our area of research. How can rules, collective employment agreements, decision-making procedures, management structures and policy organizations be organized in such a way that they are able to meet the challenges of the future without frustrating new and essential developments? The coordination, management and implementation of institutions, whether individual or network-based, public or private, form the core activities of the IGS research.

The institute does not ignore the individual, however. More than ever before, we are aware of the role of the individual when it comes to appealing to healthcare services for instance. Individual choices and notions strongly determine the prevention of diseases such as lung cancer or health risks such as obesity. But the individual's perception of technology or

government decisions is just as important a subject. In decision-making processes, having a sense of security has become at least as important as actual security.

Twente Graduate School

A large number of enthusiastic and promising IGS doctoral candidates complete their doctoral studies at the Twente Graduate School. This offers a comprehensive academic training to doctoral candidates and students participating in Research Master's programmes. Only excellent research programmes qualify; amongst these are a number of IGS programmes. Together with the Twente Graduate School, the University of Twente and the IGS hold a strong position in the worldwide competition for the best researchers in training. By attracting international top talent, the strict requirement of playing a prominent role worldwide is met.

TWENTE GRADUATE SCHOOL

At the opening of the academic year 2009, the former Minister of Education, Ronald Plasterk, gave the go-ahead for the Twente Graduate School (TGS). This broad academic programme for doctoral candidates and Master's students can be seen as a breeding ground for international research talent. This way the University of Twente is responding to the market for excellent researchers.

Only researchers of excellent research programmes can participate in the TGS. So far the IGS has contributed three programmes to the Twente Graduate School and more will follow. "Also the IGS chooses emphatically to conduct international top research," Professor Gerard van der Steenhoven, Dean of the TGS, explains. "Much of the IGS research is thus able to meet our strict requirements for our research programmes, including a very good to excellent assessment during external research reviews. Potential research groups must also figure nationally and internationally in citation indexes. Last but not least, you need to be able to raise funds so that your research group can truly count as a research school."

The content of the IGS programme interconnects well with the predominantly technological educational programme. It involves aspects of technology assessment, entrepreneurship, ethics and marketing, as well as water management. Key questions include 'Can we steer knowledge and innovation in society?' and 'Which aspects of governance are actually needed to successfully manage this?' "So it is all about understanding the dynamic between scientists, policy makers and innovation experts," Van der Steenhoven says. "This enables TGS graduates to develop more sustainable and effective methods for governing and managing socio-technological change. The Governance of Knowledge and Innovation programme thus meets our intrinsic desire to offer researchers a broader perspective on technology and innovation. They must also be able to reflect on technology in a social context and comprehend the human touch aspect thereof."

KEES AARTS, SCIENTIFIC DIRECTOR IGS

Professor Kees Aarts has been scientific director of the Institute for Innovation and Governance Studies since 2010. He also holds the chair of political science at the University of Twente. Democracy, elections, electoral behaviour, public opinion and methodology are his areas of interest. In each of these fields, Aarts has distinguished himself both nationally and internationally as a highly respected research partner and interlocutor for institutions and governments.



GOVERNANCE OF INNOVATION, TECHNOLOGY, HIGHER EDUCATION AND RESEARCH

Genomics and nanotechnology, eHealth: in order to flourish, such emerging technologies and their resultant innovations need a fertile climate for knowledge development. This climate is determined to a large extent by the degree of interaction and dynamic development of knowledge and emerging technologies in industry, science and society. The research carried out within the SRO Governance of Innovation, Technology, Higher Education and Research (GITHER) focuses on this. The emphasis here is on internal and external governance in higher education, public and semi-public research organizations and governments. Research subjects of interest include patterns for knowledge promotion in an international context, institutional entrepreneurship, and research regimes within universities, companies and governments.

LOOKING FOR QUALITY IN RESEARCH, EDUCATION AND INNOVATION

There are numerous examples of research which the IGS carries out within the framework of the GITHER research orientation. For instance, the societal component of genomics research or governance of international research collaboration in science and technology in Europe in the field of nanotechnology. But we do not only investigate the knowledge conditions for technological development. We also look at how innovation within the system of research and education can be realized. For example, we are performing analyses on the knowledge and potential of universities in Germany from an international perspective. The underlying question in this case is how these can be modernized.

Governance

With our research we are creating an even greater understanding of the role governance plays in the development of technology and innovation, on the one hand, and academic public sector research on the other. We study how the

users of bio-, nano- and gementotechnology cooperate with such actors as the corporate world, governments and research and educational institutions. What is their role and how much direct or indirect influence do they have on the developments taking place at a national and international level? What possibilities and what limitations do they have? The answers to these kinds of questions determine the type and quantity of innovations which emerge from such technological research efforts.

Knowledge debate

We have noticed that there is a huge international demand of social organizations, companies and governments for this kind of knowledge research. Even the European Commission, which wants to do away with research systems in education that are bound by national laws and is striving towards creating a more open market. Twenty years ago, universities were governed by civil servants, whereas nowadays it is much more about business. The Commission wants to encourage this development further. Ultimately, what matters is creating more quality in higher education, both in terms of education and research. We have contributed considerably to the way this open market can be accomplished. For example, in association with the European

“WITH OUR KNOWLEDGE OF GOVERNANCE CONCERNING RESEARCH AND TECHNOLOGY, GITHER CAN ADD SOMETHING ESSENTIAL TO THE EUROPEAN KNOWLEDGE DEBATE.”

STEFAN KUHLMANN

Stefan Kuhlmann is programme leader of the research orientation GITHER (Governance of Innovation, Technology, Higher Education and Research) and is Chair of the Department of Science, Technology, and Policy Studies (STePS). Kuhlmann is a political scientist whose steady focus has been on the social and political context of technological innovation and research. Until 2006, Kuhlmann was also managing director of the Fraunhofer Institute for Systems Innovation Research (Germany).



Research Council, we formulated the preconditions for new legislation on research, technology and education. The EU invests tens of millions of euros in the development of research throughout Europe, but on whose authority? How is this money distributed and how can one continue to influence the direction in which this funding flows? This is brainstorming at the highest level and our research orientation within the IGS makes us a natural discussion partner. With our knowledge of research- and technology-related governance, GITHER can add something essential to the European knowledge debate.

Lines of Research

GITHER is supported by two research centres: CHEPS and STePS. CHEPS (Centre for Higher Education Policy Studies) is an interdisciplinary expertise

centre which focuses on all levels of higher education in Europe. STePS (Department of Science, Technology and Policy Studies), on the other hand, combines education and research with the innovation of governance and new technologies.

Together, these centres conduct top research along three lines. The first assesses the diversity of the interaction between universities and industry where knowledge development, new technologies and the combination of these are concerned. The theoretical starting point lies in the innovation literature that studies the technological variety resulting from patterns of knowledge accumulation. In the second line of research, we apply the empirical findings to the governance and policy of academic public sector research. What is the state of institutional

entrepreneurship and the governance and management of innovative capacity development in research and education? We do this from a multidisciplinary perspective, making use of recent insights from the theory of innovation and entrepreneurship, institutional economic theory, sociology and political science.

Finally, the third line of research extends the institutional analysis to an international, dynamic context of research regimes within which universities, the business community and governments interact and jointly undergo development. From a theoretical point of view, the emphasis here is on the dynamic of science and technology policy, higher education policy, and innovation policy. We do this from a comparative and a multi-level governance perspective.

U-MAP CLASSIFIES EUROPEAN HIGHER EDUCATION

Accommodated within the IGS, CHEPS (Centre for Higher Education Policy Studies) is an internationally operating centre of expertise in the field of reforms and innovations in higher education. Commissioned by the European Union, CHEPS has developed U-Map (www.u-map.eu). This U-Map is an instrument for the classification of the diversity in European higher education.

“The object of U-Map is to offer both policy makers for institutions and governments and students insight into the diversity of higher education in European countries,” says CHEPS researcher Frans Kaiser. He has designed U-Map in collaboration with various European universities. “The U-Map tool offers various dimensions per educational institution. For example, what the composition is of the student population or what position the institution occupies in the region. It also shows what research is conducted there, how the institution operates internationally and, naturally, what courses it offers. The major source of this information originates from the students themselves. They feed, as it were, this enormous database by uploading their appraisal of the education and the institution.” But U-Map is much more than this. Kaiser: “For the European Union, U-Map is a means to initiate new

educational processes. And calling upon European educational institutions to cooperate in its realization has had an effect in itself. The information CHEPS needed from them namely also acted as an incentive to reflect on their own policy, i.e. ‘how does the outside world see us?’ The students who worked with us saw U-Map predominantly as an instrument to determine their choice of study, although that is not exactly what it was meant for. That is why the EU has asked us to complement the U-Map classification with an educational programme and institutional ranking. Soon, students will be able to use U-Map for this purpose too.”

MANAGEMENT OF INNOVATION AND ENTREPRENEURSHIP

The SRO Management of Innovation and Entrepreneurship distinguishes itself with internationally prominent scientific research in the field of innovation, leading-edge entrepreneurship and organizational development in a technological context. Here, attention is explicitly focused on the role of operations management, organization theory, organizational behaviour, ethics, Human Resources Management, strategy, marketing, international management and entrepreneurship. In the implementation and development of the research, we systematically seek practical applications of this knowledge within organizations, corporations and start-up companies. This occurs on a regional, national and international scale.

SUCCESSFUL INNOVATION REQUIRES INNOVATIVE ORGANIZATION

Innovation processes within organizations are often technology-driven. In practice, it appears that many young companies, for instance, invest their energy primarily in developing new products or technologies. As a result of this, they often do not grow beyond the size of a small knowledge-based company with about fifteen employees. However, in order to set a structural development in motion, a substantial input from various disciplines is needed. This requires innovative organization. Innovative entrepreneurship, for

example, demands knowledge in the field of marketing, organization and entrepreneurship, as well as strong contacts with financial backers. In fact, all of the ingredients of entrepreneurship need to be combined. This not only applies to start-ups which are busy with innovative product development but also to large service providers or government organizations that wish to examine their own internal processes, their product portfolio or their service packages in an innovative manner.

Competences

In the SRO Management of Innovation and Entrepreneurship, we actively interconnect technology, innovation and various disciplines of business administration, human resources management and entrepreneurship. We investigate the level of success within and between organizations, both in the production and the service sectors. To give an example: with the 'Competences of Innovation' project, we seek to gain a better understanding of the manufacturing industry. By working more cost effectively, this sector has striven to stand more strongly in the competitive struggle with the powerful emerging economies of China and Eastern Europe. But that is not enough. Operational management will have to become a lot more innovative too.

We have therefore developed a set of instruments for the manufacturing industry that enable us to uncover where a company's competences lie.

We are now developing these competences together with the companies during a four-year process. We started in 2008 with fifteen small and medium-sized businesses and the reactions of the participants have been positive. They are now scoring significantly better on their competences and this is translated into better market results. In our role as researchers, this research method fits into a long-term research strategy. The data will remain available after the four-year period and the companies may also continue to use the instruments. This, however, on condition that we can continue to monitor their development for the benefit of our own research efforts.

Alliances

Besides having a good understanding of one's own competences and focusing on using them wisely, cooperation is also an important - and perhaps even indispensable - success factor. After all, innovation can only take place when you can find your position amongst other actors on various levels and within different dimensions. And when you have the courage to engage in rewarding collaborations with other actors in your network. It is this on which you should model your processes. How do you approach the market? How do you deal with business relations? You have to cooperate in order to survive, but how do you do that in a smart way? We encourage alliances between companies that are not each other's competitors yet share the same

problems. You can even treat your staff as a collaborative partner. It is no longer enough that employees merely carry out their duties. They must also be able to work and think innovatively and that means that they should also be given the opportunity to do so. This is an HRM issue.

Predicting innovation

We combine our support to organizations, such as in the 'Competences of Innovation' project, with qualitative and quantitative methods of process-oriented research. This enables us to describe, explain and predict the (expected) results of innovation and constellations of innovative entrepreneurship. At the same time, by applying our expertise, we help to improve these results, processes and constellations. We develop tools, publish on the accrued knowledge and talk about it to the press, at trade fairs and conferences. Furthermore, we disseminate our knowledge (including to consultancy bureaus), and our Master's students apply it in their final year when tackling specific company-related issues.

3D-PRINTING COMPANY UNDERGOES EXPLOSIVE GROWTH WITH VENTURE LAB

Venture Lab is the largest project within the SRO Management of Innovation and Entrepreneurship. New 'high-tech, high-growth' companies are brought together and offered unique opportunities for growth. Through intensive coaching and guidance, the expectation is that many start-ups will in due course be able to provide more than a hundred jobs.

In 2009, Amitek Model Factory was the first participant in Venture Lab. This company produces three-dimensional objects with the aid of laser printers. "Using a 3D drawing programme, we can produce an image of any object imaginable," says the director, Rob Wermenbol. "We subsequently print these images in layers a tenth of a millimetre thick. In this way we can make a customized mouse for RSI patients but we can also print objects into which electronics have been integrated. 'Wiring harnesses' in the car are no longer necessary since the electronics can now be printed on the vehicle's body. Our technology is also suitable for the consumer market. I predict that in 20 years' time, everyone will own a 3D printer."

Community

With Venture Lab as a partner, Wermenbol was able to draw inspiration for his skills as an entrepreneur from the expertise of the professors at the UT and from the experiences of successful entrepreneurs and managers. "This enabled me to lay the foundation for an explosive growth of Amitek Model Factory. In addition to the many training courses, I benefited enormously from the networking possibilities Venture Lab provided. The participants inspire one another with their experiences and of course we do the necessary PR for one another. Venture Lab is a community and for me, it's almost as close as family."

Investors

Participants in Venture Lab receive intensive guidance for one year during which time the participants' personal and team skills are thoroughly trained. Entrepreneurs can also profit from a huge network and present their business plan to potential investors and international experts.

MICHAEL A. HITT: "VENTURE LAB IS UNIQUE IN THE WORLD"



There are many entrepreneurship programmes in the United States, but according to Professor Michael A. Hitt, of the Texas A & M University's Mays Business School, "not one is as effective as Venture Lab."

Hitt is regarded internationally as a research icon in the field of strategic entrepreneurship and leadership. "Venture Lab is a unique incubator worldwide," he asserts. "In the States, incubators also make the link with competences required for a business to run successfully. However, the idea to pro-actively generate so many new entrepreneurs and to accommodate them with cutting-edge expertise free of charge is unknown to us. To date, we have primarily focused on the development of the entrepreneur him-/herself and not specifically on the development of the company."

Hitt thinks that the Venture Lab concept can also make headway in his country. "I indeed see many advantages, which is why I am open to establishing a collaboration with the IGS and to share knowledge."

AARD GROEN

Aard Groen is the coordinator of the SRO Management of Innovation and Entrepreneurship and provides the IGS with strong leadership in business studies. Groen is Professor of Innovative Entrepreneurship and scientific director of NIKOS, the Dutch Institute for Knowledge-Intensive Entrepreneurship. His perspective on organizational development and innovation is based on social systems theory, a theory he places in an innovative, multi-actor and multi-level governance model.



INNOVATION OF GOVERNANCE

The SRO Innovation of Governance examines changes in the relationship between citizens and public administration services. Legitimacy and effectiveness form the main evaluation criteria. Do technological and social innovations contribute to these in any way? The research is multidisciplinary and based on insights from public administration, political science, sociology, law and economics. Public administration is regarded as a cooperative administration in which actors work together, within networks of public and private parties, to find solutions to social issues. Governments are thereby no longer the predominant criterion but are dependent on other public sector organizations, companies and social institutions. Our research is therefore based on a multi-actor perspective with consideration for the interaction between administrative strata, i.e. the nation state, but also sub-national governments and the European Union (multi-level governance).

SOCIAL OBSTACLES TO INNOVATION PROCESSES

To what extent do technical or social innovations influence political and administrative processes? The application of ICT affects the relationship between citizen and government. For example, having to resort to using the red pencil during elections due to a malfunctioning voting machine. Innovations influenced by ICT raise all kinds of questions. What effect do new social media such as Twitter and YouTube have on the communication of citizens and government? What effect does the provision of digital public services have on the accessibility of service departments for citizens? How can ICT help to increase security in the public domain? But also: how can the quality of political decision making be improved with the help of new information systems (such as GIS)? This research orientation, however, does not just examine the effects of technological and social innovations on how public administration services function. It is just as important to consider how the functioning of these services can promote or even obstruct the successful introduction of innovations.

Rules

Often the most ingenious technological innovation encounters resistance from citizens or social institutions. They are anxious about the possible health risks of new technologies or the effects these may have on their private life or their job. This kind of resistance is understandable and it is absolutely vital to take this into account when devising the decision making process. An important question is therefore: how can citizens and social organizations be involved in the innovation processes so as to guarantee that society will accept the innovations? In addition to this, we also scrutinize possible legal obstacles. Consider privacy regulations which we have introduced to prevent a 'Big Brother state'. These essentially respectable rules often obstruct an innovative approach to security issues. They make it difficult to link up databases (which are in theory accessible) even though this could assist in the tracking down of offenders. Moreover, the problem is transboundary: certain types of crime show little regard for national borders. This complicates matters, because neighbouring countries all have different privacy regulations. An important challenge for our research is the development of smart rules, which on the one hand satisfy the protection of privacy but at the same time do not impede innovation.

BAS DENTERS

Bas Denters is Professor of Public Administration at the University of Twente. He is also the scientific director of KISS, the expertise centre for Urban Affairs. Denters is a board member of EURA, the European Urban Research Association, and for a decade, until 2010, he was also chairman of LOGOPOL, the international research group for local politics and policy, of the European Consortium for Political Research (ECPR).



International perspective

When answering these kinds of questions, it is important to view cases from an international perspective. In fact many of the current issues, whether crime- or climate-related, are transboundary by nature which makes it imperative to scrutinize the approach in an international context. But then it generally makes more sense anyway to conduct comparative research from an international perspective. Similar issues are often approached differently in other countries. International comparative research affords the systematic mapping of the advantages and disadvantages of different kinds of approaches to various issues. This is helpful when considering solutions in the Dutch context.

So, it is not surprising that the SRO Innovation of Governance is strongly embedded in international scientific networks. This international orientation has characterized the Twente research in politics and public administration services from the start. The exceptionally positive results of the international research visitation (2009) underline this. The review committee acknowledged with appreciation that our research group "is not just a follower of the general mood but has proven its quality and strength by taking the lead of several international projects". It is vital that we continue to invest in the international orientation of our research in the years to come.

Public participation

At the same time, there is also a strong regional involvement with the IGS via this research orientation. Take KISS (Kennisinstituut Stedelijke Samenleving; in English: The Urban Society Research Institute), of which Bas Denters is the scientific director. This institute, comprising public and private parties who are involved in urban affairs, is working on the development and evaluation of an innovative approach to urban issues and the urban regeneration programme in the Province of Overijssel. Here, too, a central question is how to engage the public. Many professionals (architects and urban planners) regard public participation (in urban regeneration for example) as a nuisance. It is said to

**ARIANA NEED:
"SCHOOLS ARE NOT EQUIPPED FOR MOTHERS WHO WORK FULL TIME"**



Innovation is also required in the social domain. The greying population implies an increased need for women in the employment market. However, despite child care schemes, only a few women opt for a full time job. Ariana Need, Professor of Sociology of Public Governance, is investigating new and better ways to combine work and parenthood.

start to make provisions in each area. Look at Scandinavia and Germany. There they have widespread childcare between 08.00 and 18.00 hrs, whereas for us in the Netherlands it is unacceptable for our children to go to a crèche or day care centre five whole days a week. One explanation for this is the Calvinist mindset, which often urges women to go part-time or stop working altogether once they have become mothers. Despite all the child care schemes available, women just will not work for longer hours. It is not the norm. Nor does it help that schools send children home for the lunch break. Schools are just not equipped for parents who both work full time."

"Yet, when needs must, things can change. And the greying population might be the catalyst. Also the government can see the necessity and is demanding more know-how – which is exactly what the IGS research can offer. What I am currently investigating is the interaction between the government and the societal and social processes in the employment market. We should soon be able to clarify the conditions under which women are able to combine a full time job and parenthood. In this way, our research is contributing to policy innovation."

"As a government, how do you persuade mothers to work full time? That is no easy matter. It takes a lot more than just putting a childcare structure in place. You also have to consider the context in which decisions are made. What do people want? What are they capable of? And what do they actually do? These three aspects always interact and they have to be investigated right across the board. Only then can you

compromise quality and impede innovation. Public input will thus lead to sub-optimal solutions. However, public participation does not necessarily have to mean 'your wish is our demand'. It is most certainly possible for a professional to enter into a dialogue with the public and to convince them on the basis of his/her own professional expertise. It is, however, also important to listen seriously to the wishes and objections of residents and to take these into account.

Trust

A fine example is the public participation during the regeneration of the Enschede suburb, Roombeek, following the fireworks disaster there in 2000. The basic guiding premise of the regeneration was that residents should have maximum involvement. "My research group studied the extent to which this was put into effect. At the request of the local authorities, we continuously monitored the participation as regeneration progressed. This investigation established that the residents were indeed able to exercise a strong influence on the progression. The plans have now been largely implemented

"IT IS IMPORTANT TO CONSIDER HOW THE FUNCTIONING OF THESE PUBLIC ADMINISTRATION SERVICES CAN PROMOTE OR EVEN OBSTRUCT THE SUCCESSFUL INTRODUCTION OF INNOVATIONS."

and the suburb is regarded a model of urban regeneration. Winning the prestigious Gouden Piramide (Golden Pyramid) Prize in 2007 for "inspiring commissioning" and the European Urban and Regional Planning Award 2008 bear witness to this. So taking citizens seriously does not necessarily have to compromise innovation and quality. What is more, it also boosts the trust that citizens have in the local administration even when, as was the case in Enschede after the fireworks disaster, that trust has been previously damaged."

Electoral system

"And on the subject of public trust: we set up a public forum, which we are managing with the Ministry of the Interior, to look at a new electoral system. One aspect here was to improve the turnout of voters at elections. Hence one of our topics was

a voting technology that would enable people to vote from home. These are highly technical issues and the challenge lies in informing the public in such a way that they are able to form a well-founded opinion. We succeeded here. The forum has yielded many creative ideas and insights which can help a great deal to improve the democratic quality of our public administration."

OPPORTUNITIES FOR SUSTAINABILITY: KENNISPARK TWENTE

Kennispark Twente (the Twente Science Park) is a project of the University of Twente, the province of Overijssel, the Twente Region and the municipality of Enschede. Its aim is to develop the area into a knowledge-intensive region of international stature by promoting activity through the generation and transfer of knowledge. By 2020 it hopes to have created a possible 10,000 new jobs. To achieve this, Science Park's director, Kees Eijkel, acknowledges the relevance of the IGS.

In the coming years, 180 hectares (nearly 450 acres) of business premises will be developed in the vicinity of the University of Twente. Key words here are functionality, environmental or spatial quality and sustainability. We are paying particular attention to the use of resources, recycling and new ways of using energy or water. Of course, such opportunities also raise questions. What do we want exactly? Which actors can play a role? What level of ambition is feasible? What is the best way to address this? This is where the IGS can help us."

"The IGS scientifically underpins our daily activities. After all, knowledge valorization is one of Kennispark's key competences. At the same time, it forms an ideal field lab for the IGS. So we are well-suited, even in the area of sustainability.

INNOVATIVE ENTREPRENEURSHIP THE NEW NORM IN THE CONSTRUCTION INDUSTRY

The construction industry is changing. According to André Dorée, Professor of Market and Organization Dynamics in the Construction Industry, construction companies particularly used to compete with one another's prices. The construction fraud scandal, however, has resulted in the government's changing its procurement and outsourcing behaviour, as also amending its approach to contracts and other entrepreneurial risks. "Innovative entrepreneurship is now the new norm in the construction industry."

Dorée: "With the aid of the Pioneering platform, over fifty companies are now actively engaged in innovative entrepreneurship and innovation in the construction sector. And Saxion University of Applied Sciences and the University of Twente are offering support. With the

knowledge we thus acquire, we help the companies in Pioneering to hone their professional skills, stimulate their creativity and conjointly set up new training schemes for staff."

"Together with the Faculty of Engineering Technology, the IGS is studying changes in the construction business. We pick up on new technologies and trends such as sustainable construction whilst viewing each innovation opportunity from a governance perspective. During the construction process, and having to produce on-site, for example, means having to deal with local regulations and traffic issues. We help entrepreneurs to come up with innovative and relevant solutions."

SHARING KNOWLEDGE WITH DATA PROVIDERS

On a local scale, the IGS is setting up a datalab to collect the widest possible variety of statistical data and research findings. The objective is to create a place where researchers can work with cutting-edge technologies to collect and enrich data. That way they will be able to learn from one another.

With technological aids, societal issues can be scrutinized. This demands first-class data, in the same way as the product of the datalab also needs to meet the highest requirements of documentation and registration. This is why collaboration is sought with large data providers in the Netherlands and beyond. Think, for example, of Statistics Netherlands (CBS) and Data Archiving and Networked Services (DANS) in the Hague. A sound basis has already been created with a number of social projects.

"In recent years, Statistics Netherlands has expressly sought out the universities with whom to conduct research," explains CBS director Wim van Nunspeet.

"Universities are now represented on a variety of advisory councils of the CBS to help it establish what might be worthy of future investigation. Whether it is demographic, income or education data, every university has the possibility to work with CBS information. These data-sets can be accessed via an especially secured Internet connection. This enables universities to conduct all kinds of basic analyses with a wealth of data and free of charge. On condition, that is, that Statistics Netherlands may also use the scientific findings."

"Such a collaboration means that universities can conduct research that is not only more comprehensive but also with far greater data-sets. This is highly valued by both the universities and the CBS. Many scientists often ask us about our research data or our approach. Often these are quite relevant questions which even we would not always have considered. Such a collaboration thus results in all kinds of new insights."

SUSTAINABLE WATER, ENERGY AND SPATIAL GOVERNANCE

One of the greatest challenges of the 21st century is to develop and implement sustainable methods and solutions that not only make optimal use of the available space but also strengthen the economy and improve the environment. A challenge that suitably fits the research orientation Sustainable Water, Energy and Spatial Governance. The key focus here is the question how this co-evolution can be supported by new approaches to management and governance capable of facilitating sustainable innovation development.

SUSTAINABILITY IN THE 21ST CENTURY IS TOP-OF-MIND AT THE IGS

In the research orientation Sustainable Water, Energy and Spatial Governance, we are exploring new methods of governance for sustainable production, consumption and innovation, both nationally and internationally. "Water research is just one of our specializations in this SRO and although we are constantly seeking innovations in water governance and policy, we do not ignore the complexity of such issues. On the contrary. It is due to our multi-purpose and multi-actor approach, even with cross-border water projects, that opportunities can arise for workable solutions.

Building with nature

Wherever possible, we try to combine our know-how of water governance with innovations resulting from state-of-the-art technological insights. Take, for example, the 'Building with Nature' project, which entails the maintenance of the dunes along the Dutch coast. In this unique project, our technologists at the IGS are collaborating with ecologists from the universities of Delft and Wageningen. But also the coastal municipalities, district water boards, provinces and ministries are involved. With this innovative coastal development we are not only increasing security but we are also creating space for nature and recreation.

Whereas the sand used to be deposited straight onto the dunes, now so-called peninsulas (which we call sand engines) are being introduced along the coast. These man-made sandbanks, shaped like a hook, each comprises 20 million cubic metres of sand. Stretching out to sea over a length of 1.5 kilometres, their base on the beach is 2 kilometres in width. It is then up to nature itself, with its wind, waves and tides, to disperse the sand along the coast. This way, the coast grows naturally in the direction of the sea. A project such as this, particularly with this approach, is unique in the world.

Think global, act local

Town and country planning is also on our agenda. Here, aspects of economic development, social cohesion and area development come together. Our specific focus is on integrated, mutually reinforcing combinations of fighting poverty, deploying human capital, innovative land use, environmental quality and promoting social equality. All along the lines of the Kyoto principle 'think global, act local'. In India we are working on the community-based production of biofuel as an alternative to petrol. The farmers there are growing oil-producing plants and even use the fuel themselves to power the irrigation pumps. This way, the farmers no longer have to buy fuel, which was exactly the problem in the past as they lacked the financial means.

"THIS WAY, THE COAST GROWS NATURALLY IN THE DIRECTION OF THE SEA. A PROJECT SUCH AS THIS, PARTICULARLY WITH THIS APPROACH, IS UNIQUE IN THE WORLD."

JON C. LOVETT

Jon C. Lovett is Professor of Sustainable Development in a North-South Perspective at the University of Twente. For more than twelve years, Lovett worked in various developing countries and published widely on natural resource management. In this capacity, he also advised governments in the UK and Tanzania. As a scientist he has led a number of European research projects. His research interests involve climate change, biofuels and local forest management.



Energy

This is a good example of how shifts in land use, combined with the application of technological innovation and other kinds of management and governance, can result in strongly improved living conditions for large numbers of people. This initiative, moreover, leads to a decreased energy consumption and a better climate. Also the latter plays a prominent role in our research orientation, with focuses including governance aspects of energy-saving measures and technologies, reforms in the energy sector and the demands and opportunities of the Copenhagen Treaty. Wherever possible, we seek the link with water research, particularly when climate change, water systems and water governance play a role.

**STEFAN KUKS:
"WATER GOVERNANCE AS AN EXPORT PRODUCT"**



The Netherlands exports its knowledge of hydraulic engineering throughout the world. Many countries, however, are unable to profit optimally from that expertise. That is why the IGS and Dutch government bodies are putting water governance on the global map.

Policy Implementation. "The Dutch water boards, ministries and local authorities are quite proficient at applying sustainable, state-of-the-art technologies, but such government structures are often lacking in developing countries. This means that the full potential of many technological innovations in countries like Indonesia or Mozambique are not reached."

According to Kuks, the export of both technical and governance expertise does not just serve an ideological purpose. Also the Dutch business world profits from such research and trade relations. "Take the UT's spin-off companies. The interaction between their membrane technology for water treatment plants and our knowledge of governance is unique. It is with this combined knowledge, that we can devise innovative solutions to water issues at home and abroad. A great future awaits water governance."

"Technology does not work if it is not embedded in an institutional setting," asserts Stefan Kuks. He is Chairman (i.e. the dike reeve) of the Regge and Dinkel Water Board and Professor of Innovation and Water

HEALTH ASSESSMENT & PROMOTION

Increasing attention is being paid in health care to psychological and social wellbeing, as well as to mental health. Not only the individual but also care institutions and the medical profession benefit from a sound insight into these 'non-biomedical' aspects of health. The SRO Health Assessment & Promotion is an interdisciplinary research challenge that combines expertise in psychology, epidemiology, economy, medicine, and health and communication sciences. The research programme employs a strong, design-oriented approach to proposing innovative interventions and solutions to health promotion and health care in general.

AWARENESS OF PATIENT EXPERIENCE ENHANCES QUALITY OF CARE

Can you walk? Do household chores? How much pain did you have? Did you feel tired or depressed? Allowing patients to fill in personalized online questionnaires, yields a total score to doctors and patients of their physical and mental health. Combined with their medical data, this patient experience faithfully reproduces the effect of the treatment. In turn, it offers specialists and nursing staff a more personal insight, a better understanding of the patient and an enhanced quality of care.

"One of our areas of application is to test new drugs in daily healthcare practice," Erik Taal explains. At the inter-university institute DREAM (Dutch Rheumatoid Arthritis Monitoring Ltd) of the University of Twente and Radboud University Nijmegen, twelve Dutch hospitals, together with researchers from Radboud University and the IGS, are monitoring the wellbeing and experiences of patients with rheumatic diseases. This way, the positive or negative effects of new medication can be followed continuously, enabling doctors to address this with their treatment.

Customized intervention

Composing and presenting such surveys is an art in itself. Respondents must be given the questions that apply to them personally and which adequately represent their health experience. Taal: "After all, the data should provide an advice or customized medical intervention. In other words, the surveys must guarantee an excellent, individual problem analysis." Computer-adaptive testing is used to make the questionnaires suitable for application in the individual day-to-day situation. Their validity is optimized together with the Department of Research Methodology, Measurement

& Data Analysis run by Cees Glas. "Finally, user friendliness, combined with a direct employability, is imperative to both caregivers and care receivers," Taal explains.

High tech, human touch

It is precisely the relationship with technology that distinguishes the SRO Health Assessment & Promotion. "We are per definition adepts at applying high tech with a human touch. A good example of this is our introducing internet pillars in the Department of Rheumatology of the Enschede hospital Medisch Spectrum Twente (MST). In this department's waiting room, visitors can enter their health data, immediately after which the specialist can discuss the treatment results with them. Interest has been shown from all corners of Europe for this application, which we are developing with endowed professor and MST rheumatologist, Mart van der Laar. Together with this hospital, we also are setting up a general web portal which will allow patients to view their personal file, follow the progression of their illness and share experiences on a forum. Now we are going to link our Rheumatology Online Monitoring Application (ROMA) to this portal. On the basis of the data collected with ROMA, and supplemented with qualitative research among caregivers

and patients, designing interventions will be a joint effort. Consider, for example, a care support programme for people with rheumatic diseases. Such a system can also be used for other patient groups, such as those suffering from cancer or cardiovascular diseases."

E-Health

"Our Centre for E-Health Research and Disease Management collaborates on a regular basis with the National Institute for Public Health and the Environment, notably with regard to user-centred design. Together with this institute, we are developing e-health applications that concur with the user's individual situation by tailoring and personalizing the information. Together with care innovation company Medicinfo, we are designing applications for chronically ill patients, such as (self-)care applications for diabetics. This organization requires a user system so that patients can enter

their own blood levels and can keep in touch with diabetes experts. Furthermore, we have developed the internet portal MRSA-net in collaboration with hospitals in both the Netherlands and Germany. In the past we have noticed that such MRSA protocols are often printed matter doomed to a life in a drawer. For this reason, MRSA-net has been specifically based on a business model. It is a web-based tool that is easy to consult."

Interest

The activities of this research orientation can be applied throughout the care sector. Even mental health care can benefit. "That many care institutions are showing interest is understandable," says Taal. "Both the government and many patient organizations are urging the sector to measure and improve the quality of care. Linking the patient's health experience and wellbeing to methods

of treatment affords an optimal insight into the quality of the care being offered. It also allows for a comparison between the actual care and the achievements of other care institutions. That is not difficult, because with our approach they no longer need to confront patients willy-nilly with long lists of incomprehensible or irrelevant questions. For many care institutions, this currently seems to be rather a time-consuming affair."

MEASURING FATIGUE AMONG PATIENTS WITH RHEUMATOID ARTHRITIS

Once every two years, scientists, the medical profession and patient organizations from all over the world meet to discuss rheumatoid arthritis (RA). It was during one of these OMERACT congresses (OMERACT: Outcome Measures in Rheumatology), that patients successfully raised the issue of tiredness among RA sufferers. With the cause and treatment of this having been largely overlooked in the past, Dr Stephanie Nikolaus of the University of Twente subsequently investigated the impact of fatigue for her PhD project. It appeared that the fatigue of RA patients is quite different to that of healthy people. RA patients can become tired from one moment to the next, without any immediate or apparent cause. Also the duration of the fatigue can differ greatly.

To seek a greater insight and treatment options, dimensions of fatigue were formulated to disclose the ways in which patients experience their tiredness, its severity, its impact on their life and how they deal with

it. These dimensions formed the basis of extensive questionnaires that were then put to doctors, nurses and patients in order to test intelligibility and relevance. Now that more than 500 patients in the Netherlands have filled in these forms, the IGS researchers can proceed to draft simple and specifically targeted questionnaires with the aid of computer-adaptive testing. This way, each individual only needs to answer about ten questions, whereas qualitatively speaking the ultimate measurement result might well deliver a better result than if the survey had comprised 50 questions.

Such an effective questionnaire will enable a better and faster measurement of fatigue. At the same time, the results can also be used to improve the attunement of the medical and paramedical treatment to the individual patient. This IGS research is funded, inter alia, by the Foundation for Arthritis Research Twente and the Dutch Arthritis Foundation.

ERIK TAAL

Dr Erik Taal is a social psychologist and Senior Lecturer in the Department of Psychology, Health and Technology of the UT's Faculty of Behavioural Sciences. At the Institute for Innovation and Governance Studies he is responsible for the coordination of the research of the SRO Health Assessment & Promotion. Taal has built up a considerable reputation in the field of social-psychological aspects of healthcare issues. His PhD research addressed the self-management of patients with rheumatoid arthritis. In this area in particular, Taal has considerable expertise as well as strong connections with institutions in the healthcare sector.



LEON LEFFERTS: “SUSTAINABLE FUELS MUST BE ECONOMICALLY PROFITABLE”



The University of Twente is developing usable technology for sustainable energy and resources. “Sustainable energy has become a business opportunity,” says Leon Lefferts, Professor of Catalytic Processes and Materials.

“The demand for raw materials is increasing rapidly but with extraction becoming more difficult, so too have the costs risen. Companies are obliged to do something. Sustainable innovations will give them a head start from which they will later be able to profit. We are conducting research on biofuels, energy efficiency and CO2 sequestration. We actively encourage the transfer of knowledge of these fields. We conduct 90% of our research in collaboration with the industry and are applauded for the active manner in which we make our expertise available to the business community.”

Together with UT spin-off Biomass Technology Group (BTG) and the University of Groningen, UT technologists developed a pyrolysis method to convert biomass from forestry and agricultural waste as efficiently and as cheaply as possible into oil. In due course this oil could be used by existing refineries to make biofuel for vehicles. “Cars should be able to drive on these biofuels by 2020,” says Lefferts, “but large-scale application is not without consequence for industry or the community. What does the cultivation of crops imply for water usage and land consumption or for business models? It rather makes a difference whether your source of energy is extracted in a few places on a large scale (crude oil) or is locally distributed over a large area (biomass). How do you prevent energy from competing with food? We need to make fuels that we can sell to the market. And all this in the realization of widespread application.”

These issues can be addressed in cooperation with the IGS. The IGS researchers seek opportunities to embed these innovations both industrially and socially. Wherever possible we are happy to offer technological insights in the quest for solutions to social-scientific problems.”

DATALAB

Collecting and analysing large amounts of data is part and parcel of the practice of science. And in this the IGS is highly experienced. One example is the aforementioned Dutch electoral research. Also (inter) nationally the IGS plays an important role with regard to making social scientific data collections available.

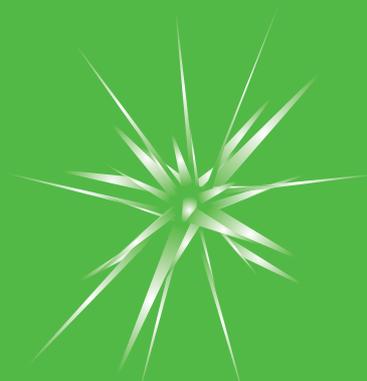
In recent years there has been a growing need for the numerical underpinning of policy. Not only companies but also the government increasingly want to be able to ascertain the results of their investments. At the same time, information systems or a combination thereof are generating an ever growing amount of data ripe for potential analysis. It is no rare occurrence, therefore, that following an incident much data appeared to be on hand that could have prevented the problem. However, due to the enormity of the data, its distribution among the actors and the absence of the correct analytical instruments, the risk went unnoticed.

The IGS has a so-called datalab in which huge amounts of data can be safely stored, processed and analysed. Of course this is in situ to support the institute’s scientific activities, but it is also being increasingly used for the development of instruments for policy analysis and information support for decision making.



For the future the IGS predicts a steady move towards much more real-time information as more and more intelligence is being added to cars, houses etcetera. Such objects, but people too (e.g. through social networks), are exchanging information to save on energy or to attune their activities. In the years to come, the IGS will focus on the development of the E-backbone of organizations from a governance perspective.

The DataLab is accessible to partners of the IGS, albeit with the strictest safety precautions.



Address:
University of Twente
Institute for Innovation and Governance Studies
P.O. Box 217
7500 AE Enschede
The Netherlands

Telephone: +31 (0)53 489 3423
Fax: +31 (0)53 489 2159
Email: info@igs.utwente.nl
Internet: www.utwente.nl/igs

Original text (in Dutch): Secondant Communicatie Kampen
Translation and copy-editing: Ricketts Text & Translation, Glane
Coordination: Nienke Nijenhuis, Marketing & Communication, University of Twente

This brochure is a product of the Institute for Innovation and Governance Studies of the University of Twente. Whilst topical at the moment of production, certain aspects of this brochure might be outdated on reading. Therefore the University of Twente cannot be held responsible for any damage resulting from the use of the information in this brochure.

Copyrights have been checked and settled to the best of the publisher's ability. Possible claims must be registered immediately and comprehensively with the University of Twente. With the exception of photographs, logos, house style and typefaces, everything in this brochure may be used on the strict condition that the source is referred to.