



CLICK NL

KNOWLEDGE & INNOVATION AGENDA

**TOP SECTOR CREATIVE INDUSTRY
2018-2021**

FAITH
IN THE
WORLD OF
TOMORROW

PREFACE

An endless stream of technological developments washes over us. We can do more, know more and want more. That impacts the way people interact, live and work together. The creative professional flourishes in these conditions. She is in the business of connecting, enticing and mobilizing people by providing different insights and portraying panoramic views, often out of more than sheer occupational interest. From a cultural and societal perspective, but also with regard to economic value, creative professionals in broad partnerships develop solutions that bring support for change.

This image, the perception of the creative industry, has been successfully reinforced since the start of the top sector policy. The sector is thriving, also internationally.

To maintain this position and to be able to face the challenges now and in the future, creative professionals must invest in new knowledge, methods and techniques that help them to do so. This agenda offers the vision and ambition for that crucial knowledge base.

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THE CREATIVE INDUSTRY STRENGTHENS THE INNOVATION CAPACITY OF THE NETHERLANDS



SUMMARY

The creative industry strengthens the innovation capacity of the Netherlands. With its innovation and imaginative power, it connects and mobilizes people and gives them faith in the world of tomorrow. The sector is an indispensable link in the generation of answers to major societal issues and in offering a meaningful interpretation to new technological possibilities. To realize this impact, the creative professional makes use of a knowledge base of Key Enabling Methodologies: strategies, methods and models that give structure and validation to the creative process. In these methodologies the professional puts people first and is capable of envisioning and portraying new worlds, and of bringing together technologies and actors from different disciplines.

Society is the creative professional's playing field. In these times, in which transitions in society are taking place, the way in which the professional works and collaborates is changing. The role of the creative professional has become more fluid than before. At the same time, more is expected of the underpinning of developed interventions and the complexity of issues and solutions is increasing. To support the creative professional in this, collaboration between the creative industry and knowledge institutes is crucial.

The top sector Creative Industry recognizes the importance of a Knowledge and Innovation Agenda (KIA) that is committed to developing a strong, valid knowledge base for the creative industry. The development and application (R&D) of this knowledge base go hand in hand. In collaboration with experts, the creative industry has split up the knowledge base, on which will be worked with this Knowledge and Innovation Agenda, into three lines that complement each other without being mutually exclusive.

- Design for Change is aimed at strategies that mobilize people by influencing their behavior. This line is about knowledge around system transitions in which a multitude of actors comes together.
- The Human Touch specifically looks at the individual's experience and assignment of meaning. Interests, values and the quality of life of the individual in his/her social environment are central here.
- Value Creation is aimed more at the creative industry itself and focuses on the new role, responsibility and possibilities assigned to creative professionals.

**COLLABORATION
BETWEEN THE
CREATIVE INDUSTRY
AND KNOWLEDGE
INSTITUTES IS
CRUCIAL**

In this KIA the sector considers the societal challenges from its own perspective; it views them through the lens of the knowledge base of the creative industry. By working together in crossovers with other sectors and governments, it goes to work on the various challenges. Through (applied) research and innovation in the area of these challenges, domain-specific knowledge will be generated, which will subsequently improve the creative professional's ability to realize social impact.

In this KIA the top sector designates a number of domains in which Dutch creative professionals want to and are able to internationally fulfil a critical role; these domains allow room for the characteristic added value of the creative industry and make the application of the knowledge base possible. They are domains in which the mentioned developments in the work field are clearly present, and which ask for an interdisciplinary approach by creative professionals.

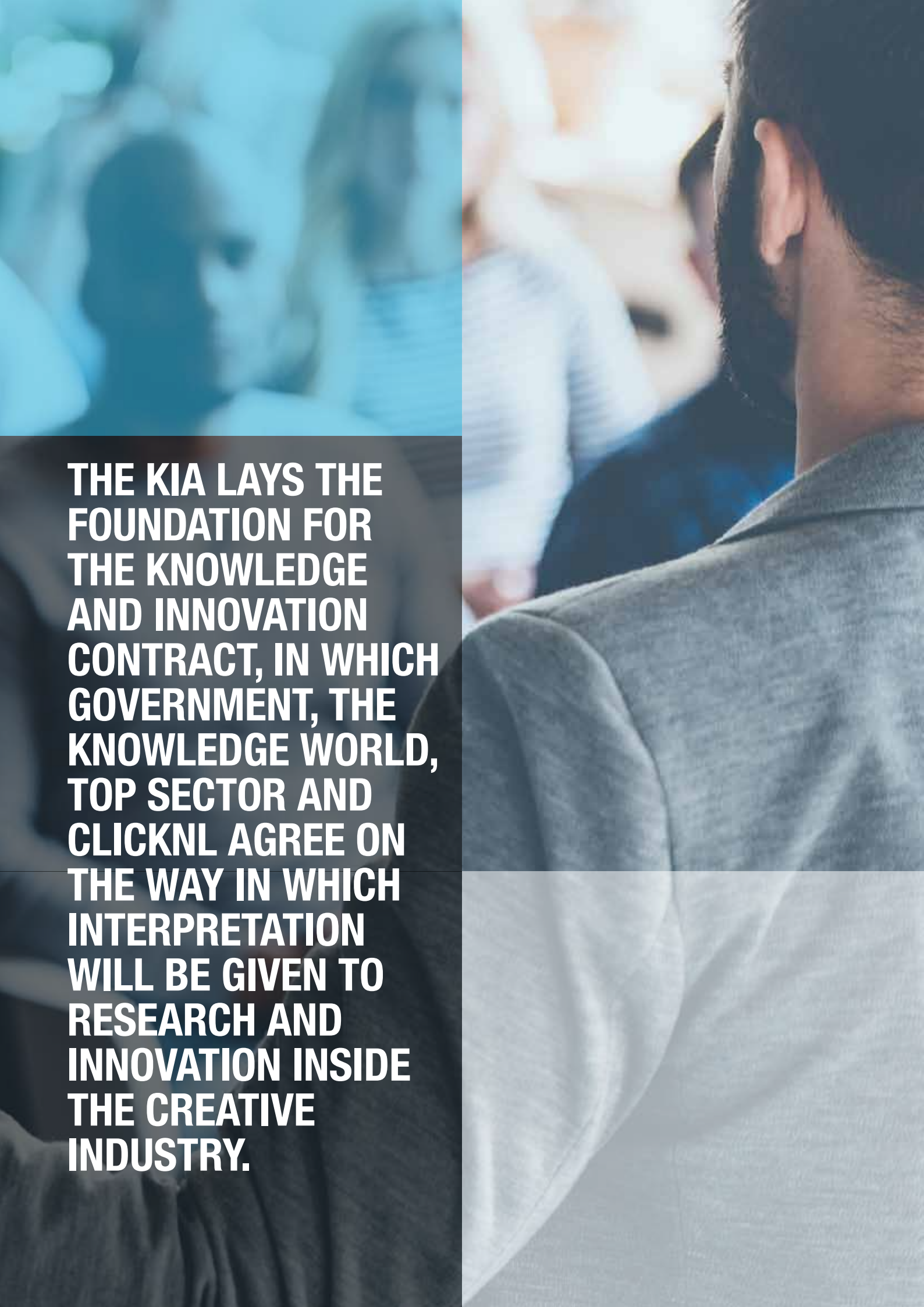
The execution of this Knowledge and Innovation Agenda will manifest itself in public-private partnerships, in which the link is made between issues in the application domains, the societal challenges, and the knowledge base of the creative industry, and in which forms of research and development will be used that align with the creative disciplines and that integrate practical, applied and foundation-laying research. Naturally, they will have to be open to creative professionals; working in large(r) industrial organizations, in small to medium-sized businesses, and as freelancers, across the top sector.

TABLE OF CONTENTS

PREFACE	3
SUMMARY	5
TABLE OF CONTENTS	9
INTRODUCTION	13
PART 1 - STRATEGY	17
1. R&D FRAMEWORK	18
1.1 TASK FOR THE CREATIVE INDUSTRY	19
1.2 KNOWLEDGE BASE: KEY ENABLING METHODOLOGIES IN THREE ROADMAPS	21
1.2.1 DESIGN FOR CHANGE (DFC)	22
1.2.2 THE HUMAN TOUCH (THT)	23
1.2.3 VALUE CREATION (VC)	24
1.3 CONTRIBUTING TO SOCIETAL CHALLENGES	26
1.3.1 LENS OF THE CREATIVE INDUSTRY	26
1.3.2 INCLUSIVE AND INNOVATIVE SOCIETY IS CENTRAL	27
1.3.3 QUESTIONS AND STARTING POINTS FOR THE SECTOR	28
1.4 INNOVATIVE SOLUTIONS IN CHALLENGING DOMAINS	32
1.4.1 DEVELOPING IN APPLICATION DOMAINS	32
1.4.2 ATTENTION TO KEY ENABLING TECHNOLOGIES	33
2. DEVELOPING THE KNOWLEDGE BASE	34
2.1 A COLLECTIVE PUBLIC/PRIVATE APPROACH	35
2.2 INHERENT AND INNOVATIVE RESEARCH FORMS	36
2.3 LEADING TO KEY ENABLING METHODOLOGIES	37
3. CONNECTING AND APPLYING THE KNOWLEDGE BASE	40
3.1 FLAGSHIPS FOR PUBLIC-PRIVATE PARTNERSHIP	41
3.2 KNOWLEDGE DISSEMINATION AND NETWORK FORMATION	43
3.2.1 ROADMAP COMMISSIONS	43
3.2.2 COMMUNITIES AND EVENTS	43
3.2.3 PLATFORM PHYSICAL AND ONLINE	44
3.3 CROSSOVERS	44
3.4 FIELD LABS AND CONNECTING TO REGIONAL AGENDAS	45
3.5 LIFE-LONG DEVELOPMENT	46

4. R&D ECOSYSTEM	48
4.1 SECTOR CREATIVE INDUSTRY	49
4.1.1 CHARACTERIZATION	49
4.1.2 FACTS AND NUMBERS	50
4.1.3 CLICKNL	51
4.1.4 PARTNER ORGANIZATIONS	52
4.2 KNOWLEDGE PARTNERS	52
4.2.1 UNIVERSITIES AND COLLEGES	52
4.2.2 TO2 INSTITUTIONS	53
4.3 GOVERNMENT	53
4.3.1 GOVERNMENT AS PARTNER	53
4.3.2 REGIONAL STRENGTHS	54
4.4 TOOL SET	54
4.4.1 PPS GRANT	54
4.4.2 NWO AND SIA	55
4.4.3 EUROPE	55
4.4.4 SME INNOVATION STIMULATION REGION AND TOP SECTORS (MIT)	56
4.4.5 STIMULATION FUND CREATIVE INDUSTRY	56
4.4.6 OTHER FUNDS	56
PART 2 - ROADMAPS	61
5. ROADMAP DESIGN FOR CHANGE	64
5.1 INTRODUCTION	65
5.2.1 DESIGN FOR BEHAVIORAL CHANGE	66
5.2.2 TOWARDS TRANSITION	68
5.2.3 PREDICTION & ADAPTATION	69
5.2.4 RESISTANCE TO CHANGE	69
5.3 SOCIETAL CHALLENGES AND THE ROLE OF THE CREATIVE INDUSTRY	70
5.3.1 CIRCULAR SOCIETY	71
5.3.2 HEALTHY BEHAVIOUR	73
5.3.3 RESILIENCE IN SOCIETY	76
5.3.4 ENERGY AND BEHAVIOUR	78

6. ROADMAP THE HUMAN TOUCH	80
6.1 INTRODUCTION	81
6.2 RESEARCH DIRECTIONS FOR THE KNOWLEDGE BASES	82
6.2.1 DATA-DRIVEN DESIGN	82
6.2.2 VALUE OF SYSTEMS	84
6.2.3 THE MECHANISM OF MEANING	84
6.2.4 FREE-RIDERS	85
6.3 SOCIETAL CHALLENGES AND THE ROLE OF THE CREATIVE INDUSTRY	86
6.3.1 QUALITY OF LIFE & WELL-BEING	87
6.3.2 TRUST & SECURITY	88
6.3.3 PERSONAL EXPERIENCE	89
6.3.4 HUMAN EMPOWERMENT	91
7. ROADMAP VALUE CREATION	92
7.1 INTRODUCTION	93
7.2 RESEARCH DIRECTIONS FOR THE KNOWLEDGE BASE	94
7.2.1 NEW DESIGN CAPABILITIES	94
7.2.2 BUSINESS MODELS	99
7.2.3 EVIDENCE BASED IMPACT	102
7.2.4 ART AND INNOVATION	103
COLOPHON	105
APPENDIX 1	
LIST OF INSTITUTIONS / ABBREVIATIONS	109
APPENDIX 2	
PARTICIPANTS EXPERT SESSIONS AND CONSULTED EXPERTS	111



**THE KIA LAYS THE
FOUNDATION FOR
THE KNOWLEDGE
AND INNOVATION
CONTRACT, IN WHICH
GOVERNMENT, THE
KNOWLEDGE WORLD,
TOP SECTOR AND
CLICKNL AGREE ON
THE WAY IN WHICH
INTERPRETATION
WILL BE GIVEN TO
RESEARCH AND
INNOVATION INSIDE
THE CREATIVE
INDUSTRY.**

INTRODUCTION

With this agenda CLICKNL supports the mission of the Top Team Creative Industry: to develop the Netherlands into the most creative economy of Europe.

This is the fourth edition of the Knowledge and Innovation Agenda (KIA) for the Dutch top sector Creative Industry. It concerns the period 2018-2021. The agenda gives direction and interpretation to the substantive course that the Top Consortium for Knowledge and Innovation (TKI) CLICKNL of the top sector lays out for knowledge development and application within and from the creative industry. With this agenda CLICKNL supports the mission of the Top Team Creative Industry: to make the Netherlands into the most creative economy of Europe.

The KIA lays the foundation for the knowledge and innovation contract, in which government, the knowledge world, top sector and CLICKNL agree on the way in which interpretation will be given to research and innovation inside the creative industry. It is leading for the calls for research (calls for submission of research proposals) focusing on the creative industry and researchers. These calls will be outlined by NWO and SIA in the coming years. This agenda will also be leading for the interpretation of regulations that are interpreted and executed by RVO, for example.

At the start of the TKI in 2012, programming and putting research and innovation for the creative industry on the agenda was still in its infancy. Forming networks of sub-sectors (fashion, media & ICT, gaming, built environment, design, cultural heritage) in the first period worked well to gather the need for R&D from those sub-sectors. In 2016, CLICKNL, the networks and the Top Team jointly decided to focus on overarching and multidisciplinary issues, so that other sub-sectors (such as music, film and festivals) may also participate. That was one of the reasons for developing this new KIA.

CREATION OF THE KIA

The KIA is a coproduction of CLICKNL and the Top Team Creative Industry. During the composition, they let themselves be inspired by the Creative Council, the members of the Federation Dutch Creative Industries and a large number of individual companies, creative professionals and researchers. The roadmaps for the knowledge base in this agenda were compiled by three core teams, with input from a series of expert sessions with this constituency.

READING GUIDE

This KIA exists of two parts: Strategy and Roadmaps.

Part 1 (Strategy) outlines the R&D framework of the creative industry; the task, knowledge base, (societal) challenges and application domains (chapter 1). Next, it outlines the ambitions for the development (chapter 2) and application of the knowledge base (chapter 3). Finally, an overview of the R&D ecosystem of the creative industry will follow (chapter 4).

Part 2 (Roadmaps) goes deeper into the content of the knowledge base and how it is connected to the societal challenges. Then, we outline the roadmaps of Design for Change (chapter 5), The Human Touch (chapter 6) and Value Creation (chapter 7), respectively. The roadmaps are living documents which, over time, will be enriched and refined by the (at the time of writing yet to form) roadmap commissions.

READING GUIDE

01

STRATEGY

01

R&D-
framework

02

Developing
the knowledge
base

03

Connecting and
applying the
knowledge base

04

R&D-
ecosystem

02

ROADMAPS

05

Design for
change

06

The Human
Touch

07

Value
Creation

PART 1: STRATEGY

1



R&D-FRAMEWORK

The top sector Creative Industry strengthens the innovative capacity of the Netherlands. It does so from both the business and the scientific world.

With its creative capacity and methodology, it's an important partner in generating answers to social and economic challenges and in helping to implement them. A strong creative industry offers the opportunity to reach innovative break-throughs together with other sectors. To be able to realize this contribution from the creative industry to our economy and society – now and in the future – a strong knowledge base is needed. The Knowledge and Innovation Agenda aims to strengthen that knowledge base and to advance its application. In doing so, it will look at challenges that span across the creative industry's work field.

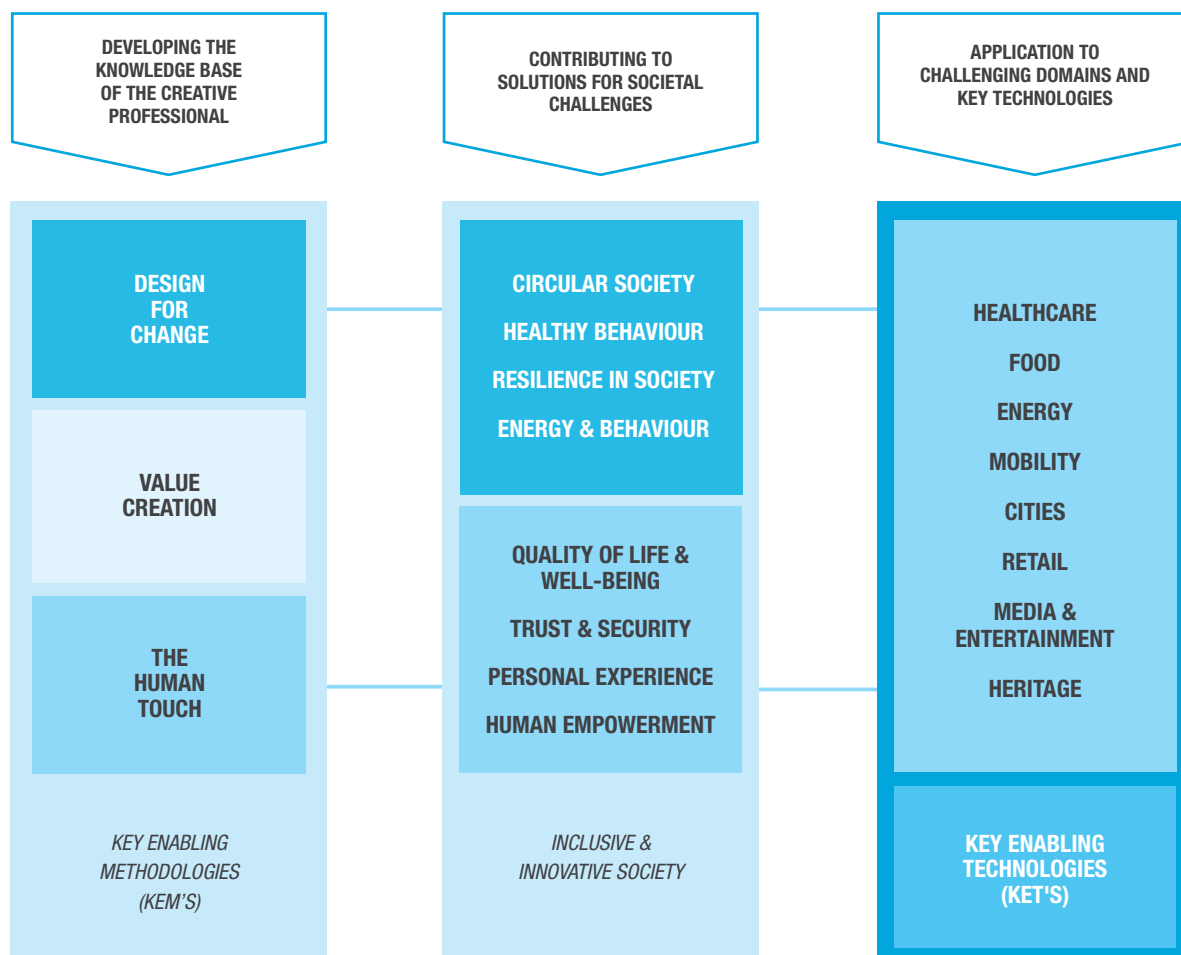
1.1 TASK FOR THE CREATIVE INDUSTRY

The creative industry is a sector that creates economic value by aligning technology with the values and interests of people and society. The sector is increasingly applying the skills it uses to that end to transitions in areas such as health, energy and social cohesion.

The creative industry can develop new experiences that give meaning to our existence. Meaningful interventions offer an effective contribution to a resilient society and the transitions that are required to alleviate societal tensions. Creative professionals do this by putting people first, imagining new worlds and visions, bringing together stakeholders and knowledge from a multitude of disciplines, creating new value propositions and by applying creative skills (creativity and methodologies). Society is the playing field of the creative professional. Changes in society, in turn, have an impact on the professional practice of said professional; far-reaching digitalization of products, services, environments and experiences, for example, influence the developmental process and the nature of the end product. More than ever, creative professionals are expected to develop complete and adaptive systems, instead of a predetermined end product. These systems have far-reaching consequences for human existence: for

values, habits, social networks and directly for the economy. These intricacies complicate the creative professional's task.

Creative professionals need to be aware of the impact of their work, and have to know how to steer it in the right direction in order to come to solutions that successfully contribute to the necessary transitions. This comes alongside essential ethical questions. In addition, due



1.1 Framework Knowledge and Innovation Agenda

to this impact and the scale, the creative professional is involved earlier in the development process and is kept on board longer: after delivery, further development happens and research is done into the functioning of the product or service. Combined, these are causing both the way of collaboration and the creative professional's role in the process to change.

So, the creative professional is confronted with:

- complex issues (system level)
- necessity for accountability and substantiation (evidence based)
- lasting (further) development of solutions (permanent beta)

With this in mind, the Knowledge and Innovation Agenda Creative Industry 2018-2021 was compiled. Image 1.1 schematically displays the content and structure of the Knowledge and Innovation Agenda for the creative industry.

1.2 KNOWLEDGE BASE: KEY ENABLING METHODOLOGIES IN THREE ROADMAPS

The creative industry focuses on intervention, causation and mobilization. The knowledge base of the creative professional provides the tools to realize this: these Key Enabling Methodologies (KEMs) are validated strategies, methods and models, which the creative professional uses to carry out his or her work and realize impact. The KEMs give structure to the creative process, making it evidence-based and replicable. By applying KEMs, creative professionals can, among other things, realize solutions that contribute to solving societal challenges.

Research must lead to more and better KEMs, so that the creative professional will be able to do an even better job in the future. In chapter 2.2 we go into more detail about the KEMs.

In this Knowledge and Innovation Agenda the knowledge base for the creative professional consists of three thematic lines: Design for Change. The Human Touch and Value Creation. These lines were developed based on the changing task for the creative industry (see paragraph 1.1) and were further refined after various consultations with experts from colleges and universities and from the creative sector. Design for Change and The Human Touch have a direct relation to tackling societal challenges. Value Creation is aimed at the methodology and organization inside the sector.

Creative professionals often apply knowledge and methods from these lines in conjunction, but for the purposes of the further development of the knowledge base it's relevant

THE CREATIVE INDUSTRY IS AIMED AT INTERVENTION, CAUSATION AND MOBILIZATION

to conceptually untangle these lines. This is because the research questions relating to the three lines will focus on different scientific domains: Design for Change will focus on designing disciplines and behavioral sciences, The Human Touch will mainly focus on the humanities and computer science, and Value Creation will likely focus on organizational specialists and economists. All roadmaps will be equally and specifically multidisciplinary in nature and will rely on input and knowledge from both the technical and ICT sciences, as well as the behavioral sciences and humanities. In the practice of the creative professional the thematic knowledge will (naturally) coincide accordingly.

An extensive elaboration of the roadmaps will follow in Part 2 of this KIA. First, here follows a short summary including the introduction of four sub-themes per roadmap. These sub-themes were formulated based on conversations with experts from the field in the run-up to this KIA, and tie in with actual themes in the current work field.

1.2.1 DESIGN FOR CHANGE (DFC)

Strategies for mobilizing people by influencing, motivating and stimulating behavior.

Between 2010 and 2015 the CRISP program was active: a research program for the creative industry in which knowledge institutes, companies and creative small and medium-sized companies worked together on research into the design of Product Service Systems (PSS). The current theme 'Design for Change' can be seen as a continuation of (parts) of the substantive line of that program. It intends to develop knowledge about system transitions aimed at behavioral change. Digital, socio-technical systems can make a crucial contribution to societal challenges in the fields of, among others, health care, security, immigration and energy. However, these decisions are not easily realized and the effects of interventions with new creative products and services are hard to predict. People's norms and behaviors are hard to influence, and which impact is desired in the first place? Typical is the engagement of many parties (stakeholders); synchronizing the varying interests is a challenge for the creative professional. This roadmap will be further elaborated in chapter 5, through

four sub-themes. The corresponding research questions mentioned below are meant to be illustrative, not exhaustive.

1. Design for Behavioural Change

- a. Which universal strategies and mechanisms of behavioral change are effective?
- b. How do you map an existing system and determine where and when you need to intervene in order to achieve the desired effect?

2. Towards Transition

- a. Under which circumstances are disruptive changes embraced and how do we migrate from an old to a new system?
- b. How do we treat ownership of a system and what does that mean for the business models?

3. Prediction and Adaptation

- a. How can we predict, continually monitor and measure societal impact?
- b. What role does data play in developing and continually updating a system?

4. Resistance to Change

- a. Why do we encounter resistance to change with government, public and industry?
- b. How do we defy this resistance?

1.2.2 THE HUMAN TOUCH (THT)

Strategies for uniting and connecting, seducing, giving insight and building trust in people.

The creative industry focuses on people. People's interests, needs and values are always the starting point for the development of new products and services and the sector has many tools and methods at its disposal to support this user-centered designing and to create new experiences in the process. When it comes to the creation of content as well, there is a lot of knowledge available that help a creative professional to tell a compelling story, offer a format that sticks or develop a game that motivates.

However, due to the work field's shift to a system level and long-term impact, the individual is at risk of disappearing from sight. Socio-technical systems are often hard to fathom. Inside that growing complexity we must continually shift back to the human dimension, the implication for a culture or community, and the personal or user experience. What makes people happy, what touches them and what challenges them? And what degree of autonomy do they want to retain or give up? Alongside the growing (technological) possibilities, the question of what we want to measure and know (the quantified self) and what we can do with these data in varying domains such as e-health, education and museums increasingly pops up. This roadmap is further elaborated in chapter 6 through four sub-themes, mentioned below with a couple of illustrative research questions each:

1. Data-driven design

- a. Which data from our lifestyle and behavior are needed for customization of products and services?
- b. How do we treat cultural diversity in our propositions?

2. Value of Systems

- a. How do users understand and experience systems and what relationships do they form with them?
- b. What are the limits of autonomy and privacy in our interaction with systems?

3. The Mechanism of Meaning

- a. How do people assign meaning to the world and technology around them?
- b. What mechanisms cause a story (a TV-format, a game) to work for an individual or group?

4. Free-riders

- a. Which kinds of services are people willing to pay for, and which types of services do they expect to be available for free?
- b. What do/don't people want to decide themselves, and during which moments do they prefer hands-on guidance?

1.2.3 VALUE CREATION (VC)

Strategies for realizing solutions and new propositions; knowledge about innovation power and designing skills.

The creative sector is a thriving and innovative sector that knows how to keep reinventing itself. It's capable of swiftly catering to questions from and changes in the market, while simultaneously producing new creative propositions that ensure its *raison d'être* and income. Nevertheless, creative professionals, independent of the context they work in, will face changes that are the result of their new task, role and responsibility. They must learn to deal with the digital transition, with thinking in systems while taking into account the human dimension, and with the fact that their products have to be able to be permanently monitored and modified. Additionally, there is a growing number of considerations and stakeholders they must involve in their design. These changes are reflected in the demands we put on their competences, on the way in which they realize value and on the (unconventional) resources they leverage to achieve their goals. In what way does the changing content and scale of the work impact the organization models in the creative industry? How can the creative professional adopt new knowledge and methods?

This roadmap will be further elaborated in chapter 7 through four sub-themes, mentioned below with a number of illustrative research questions each:

1. New Design Capabilities

- a. What kind of network organizations and alliances of self-employed workers are needed in the creative industry to allow the creative professional to optimally do his/her job?
- b. How can creative professionals contribute to orchestrating interdisciplinary collaboration and to initiating creativity in service of societal issues?
- c. What degree of insight in the (im)possibilities of technology is vital for the creative professional?

2. Business models

- a. In what new ways can the creative professional protect and capitalize on value?
- b. How can the creative industry help organizations to make the transition from thinking in transaction / product / ownership to thinking in co-creation / service / access?

3. Evidence Based Impact

- a. How do you visualize impact; which methods allow for a designed system/transition to be experienced/prototyped?
- b. Which knowledge and tools must the creative professional have to be able to predict/design the ethical and societal acceptance of innovations?

4. Art and innovation

- a. How can the artistic experiment serve as a model for make processes in other domains?
- b. How can crosspollination between artistic research and scientific methods contribute to insight and innovating practices?

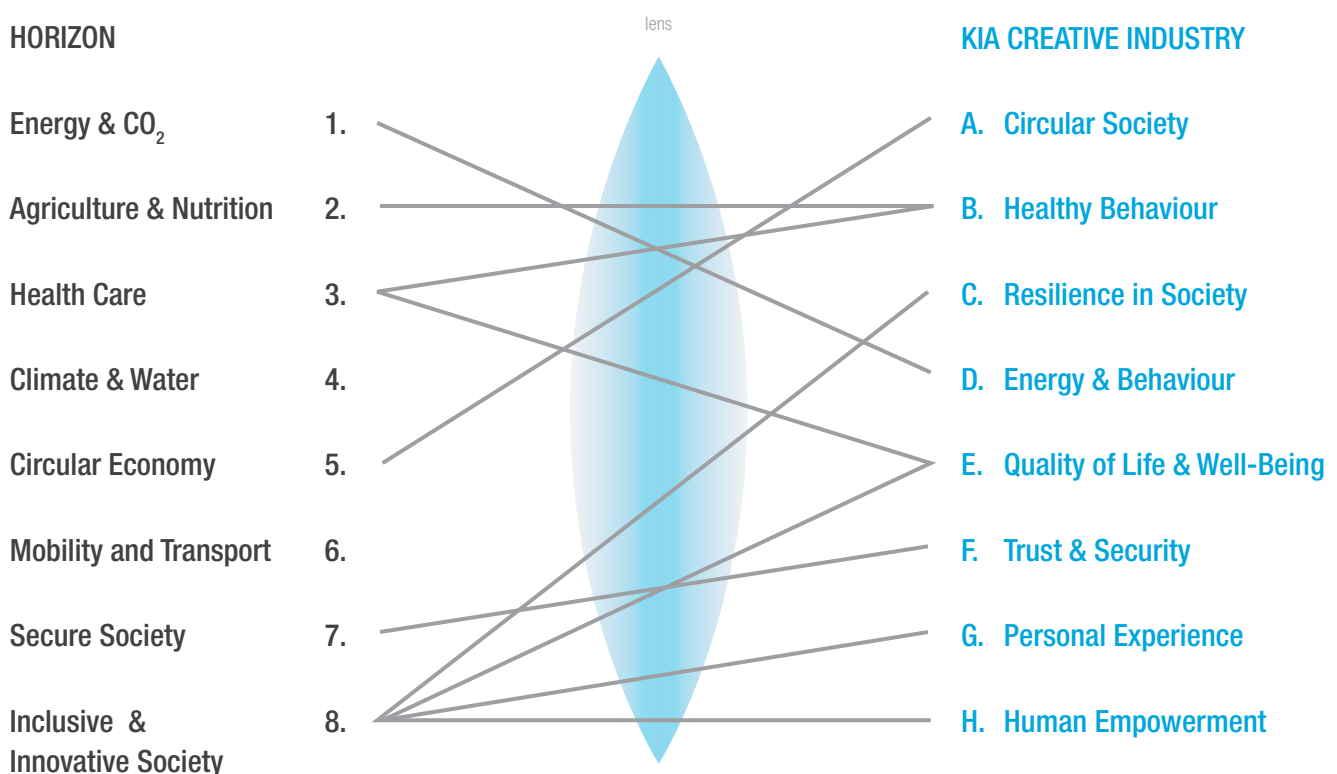
**HOW CAN THE
CONSUMER BE
SPURRED INTO
MORE ENERGY-
EFFICIENT
BEHAVIOR?**

1.3 CONTRIBUTING TO SOCIAL CHALLENGES

The major societal challenges are defined in the European research program Horizon 2020 in eight themes, the Grand Societal Challenges. The Dutch Ministry of Economic Affairs asks of the top sectors to align their Knowledge and Innovation Agendas accordingly. This paragraph describes the way in which the top sector Creative Industry does so.

1.3.1. LENS OF THE CREATIVE INDUSTRY

The creative industry looks at the societal challenges from a specific angle: through a lens of sector- inherent added value. For instance, when looking at the Energy and CO₂ issue, the creative industry can primarily contribute in areas that concern behavior: how can the consumer be spurred into more energy-efficient behavior? With regard to this challenge, we therefore focus on the more specific angle of Energy & Behavior in this KIA. The other societal challenges



1.2: The challenges on the European Horizon 2020 Agenda viewed through the lens of the creative industry.

on this agenda came about in a similar fashion. Image 1.2 shows how the challenges as described in Horizon 2020 relate to the challenges in this KIA. Additionally, the challenges in this KIA were selected this way because the creative industry has already proved itself or sees new possibilities to create impact in relation to these challenges. Furthermore, the selection is inspired by and ties in with a large number of routes from the National Science Agenda (NWA).

The creative industry expects to generate domain-specific knowledge through (applied) research and innovation in defined challenges, which enables the creative professional to realize more societal impact. Once this knowledge is generalized, it becomes part of the knowledge base of the creative industry and can be applied to other challenges as well. Within the knowledge base there is also attention to ethical questions. This is because the creative professional is increasingly confronted with questions about the impact of her work and the way in which she has to relate to it.

1.3.2 INCLUSIVE AND INNOVATIVE SOCIETY IS CENTRAL

Remarkable is the special relation to the Horizon 2020 challenge “Inclusive and Innovative Society” that manifests itself in four of the designated challenges. This is no coincidence: to be able to tackle the societal challenges and the transitions needed for them, we need a society that embraces and enables collaboration; an inclusive and innovative society. Innovative in the sense that people are put first and possess the knowledge, competences and culture needed to embrace and enact innovation. Inclusive in the sense that innovation ought to be accessible and available for everyone and help to participate in society. The challenge therein is to connect the global, systemic solutions and developments to the local, human dimension: a fitting challenge for the creative industry. Moreover, this needs to be connected to the digitalization of society; it's essential to enable society to do so thoroughly. This leads to an agile and flexible society that is capable of anticipating, responding to and interacting with the changes coming our way. The Netherlands has the qualities needed to play an exemplary role in this: a living lab where citizens, businesses and civil organizations work together and interact with science to analyze and design answers to challenges.

The creative sector connects a number of societal challenges to develop the road toward an Inclusive and Innovative Society. Although all of the mentioned themes contribute to this, the topics Resilience in Society, Quality of Life & Well-being, Personal Experience and Human Empowerment in particular play a big role.

1.3.3. CHALLENGES AND STARTING POINTS FOR THE SECTOR

The creative industry's lens on the societal challenges gives it focus, also in with regard to relevant routes from the National Science Agenda (NWA). Additionally, it offers starting points for challenges on the agendas of specific departments within the Dutch government, for example.

a. Circular Society – the circular economy is an economic system meant to maximize re-use of products and resources and to minimize value destruction. An important strategy in this context is the transition from possession to use. How can systems advance this transition? And how can we develop new circular propositions that help accelerate the transition? This focus connects to the NWA routes Circular Economy (2.3 Consumer and Society) and Smart Industry (1B Smart Services). Additionally, it answers the challenges that the Ministry of Infrastructure and Environment focuses on (in the framework of the nation-wide program Circular Economy). CLICKNL executes the project CIRCO in this framework.

b. Healthy Behaviour –In recent years, the definition of health has shifted from a focus on illness to a focus on people and their ability to adapt and take control. How can smart systems assist them in this? How can we better utilize the positive effects of greenery on health and wellbeing in working and living environments (in cities)? An approach to healthy behavior from the perspective of the creative industry fits in with the approach of, among others, the NWA routes Personalized Health and Sustainable Production of Healthy and Safe Food (the informed consumer), as well as the top sectors Life Sciences & Health and Agri&Food's initiated program around personal vitality in connection to major life events. These moments, like being admitted to a hospital, loss of a job, divorce or birth cause disruption in life and functioning. These changes have a great impact on health and behavior. The top sector creative industry looks for collaboration in this with the mentioned top sectors and the departments connected to them, such as VWS, Agriculture and Wageningen Research.

HOW CAN WE DEVELOP PRODUCTS AND SERVICES THAT ACTUALLY CONTRIBUTE TO HAPPINESS AND QUALITY OF LIFE?

c. Resilience in Society – In a constantly changing environment it's important that individuals and society as a whole are and remain resilient. Sustainable employability of people is seen as an important element of the resilient (inclusive) society. How can socio-technical systems contribute to the self-reliance of elderly, integration of people in society, and to participation in the job market? How do we foster social cohesion in a society that is burdened by polarization? How do design institutions and systems advance our wellbeing/happiness? The top sector creative industry views this theme as an important part of the central challenge of the Inclusive and Innovative Society. The NWA route Resilient Societies (specifically the part “toward new ways of work and value creation) offers useful starting points, as well as the agendas of the Ministry of Education Culture and Science, Social Affairs and Internal Affairs.

d. Energy and Behaviour – to reach the climate goals of the UN climate agreement, citizens, businesses and governments will have to change their approach to energy consumption. How can we spur them into more economical use of energy and fuels and/or into searching for clean(er) alternatives? The transition to renewable energy is leading to a change in the role of the (energy)consumer that is more conscious and thus actively chooses for energy use. In addition, the energy sector will have to find new ways to involve consumers. Energy is becoming a tangible consumer good. The new energy consumers – prosumers – therefore have to be seen as important stakeholders in the innovation processes that will lead to the energy transition. This asks for insight and knowledge about end users from the social sciences and humanities. It asks for knowledge about community practices, technologies and infrastructures that can be utilized, and for knowledge from involved organizations. Most importantly, the transition asks for insight into the connections and dynamics on the level of those systems and how new solutions can successfully be created within them. This goes beyond describing and offering a normative framework; it offers the tools needed to come to human-centered solutions.

This ties in with the NWA route Energy Transition, especially the ambitions of the top sector Energy and the respective board of the Ministry of Economic Affairs. The top sector Creative Industry is developing a program together with them to give further shape to this.

e. Quality of Life & Well-being – We are increasingly aware that, in the long term, our unbridled consumption doesn't automatically lead to more well-being. Furthermore, our way of life is under physical and psychological pressure due to the demands of our work and environment. How can we develop products and services that actually, in the long term, contribute to happiness and quality of life? What role can big data play in the quality of life in health care, traffic and smart cities? How do we utilize systems to contribute to quality of life? What impact will this have on the habitat? As part of the top sector Creative Industry's focus on an Inclusive and Innovative Society, this question in various ways corresponds with, among others, the NWA routes Big Data (Quality of life) and Smart Livable Cities, and is complementary to the agenda of the ICT sector.

f. Trust & Security – The digital world comes alongside new questions about trust and security. How do we ensure that people keep faith in smart systems and how do we guarantee an acceptable level of security and privacy in a digital world?

The NWA route Big Data is the point of departure here, in close collaboration with, among others, the top sector ICT and the agendas of the Ministry of Defense and the Ministry of Security and Justice.

g. Personal Experience – Society looks for balance between collectivity and individuality. Uniqueness is a great good and part of the achievements of the modern society, but has a downside that can negatively impact solidarity. It's becoming increasingly easy to develop custom-made products and services, but what will be their impact on sustainability? How do we create products and services that meet the need for a personalized offer? How can we create value for the end user through digitalization and information in production, content creation and design?

The creative industry views this as a challenge that contributes to the Inclusive and Innovative Society; it builds on the technological challenges of the top sector HTSM and the program Smart Industry and ties in with desired and desirable solutions. In doing so, it connects with the NWA route Smart Industry (Smart Products) and offers fertile grounds for the NWA route Art, Research and Innovation.

h. Human Empowerment – Due to complex developments, many citizens have gotten the feeling that they hardly have any control over their personal living conditions. How can we empower people to be able to take care of themselves again? What does the past teach us about this and how may that contribute to new insights? The NWA routes Living Past (the citizens as expert; about citizen science and changing role in society) and Resilient Societies address these challenges. The top sector Creative Industry views this theme as an important part of the central challenge of the Inclusive and Innovative Society.

These eight societal themes are (naturally) also closely linked to the no less than 17 Sustainable Development Goals the UN has formulated. For instance, the themes Healthy Behavior and Quality of Life have many commonalities with goal 3 – good health and well-being, the topic of Circular Society is addressed in goal 12 – responsible consumption and production -, and elements from both Resilience in Society and Human Empowerment can be found in goal 11 – sustainable cities and communities.

**THESE EIGHT DOMAINS OFFER ROOM
FOR THE CREATIVE INDUSTRY'S
CHARACTERISTIC ADDED VALUE AND
ENABLE THE APPLICATION OF THE
KNOWLEDGE BASE**

1.4 INNOVATIVE SOLUTIONS IN CHALLENGING DOMAINS

The third leg of the R&D framework comprises the application domains. Innovations in the application domains are connected to the knowledge base through societal challenges, so that these innovations can strengthen the knowledge base and vice versa. In doing so, the entire knowledge and innovation circuit, from fundamental to applied research, is closed.

1.4.1 DEVELOPING IN APPLICATION DOMAINS

In this KIA the sector designates a number of domains in which Dutch creative professionals (can and want to) play a critical (international) role, such as health care, energy, food and mobility. In addition, domains in which the creative sector has traditionally made important contributions are cities, retail, media & entertainment, and heritage. These eight domains were chosen because they offer room for the creative industry's characteristic added value and make the application of the knowledge base possible. They are domains in which the mentioned developments and the task for the creative industry (C 1.1) are clearly present. Finally, these domains offer room for connections between sub-sectors of the creative industry, such as fashion, design, architecture and the arts. This has contributed to an increased awareness about the value of the creative industry as a whole, among individual industry partners.

In addition to these domains there are also sectors – more specialized and more chain-oriented than domains – in which creative professionals play an important part. This possibly asks for more specific sector agendas that align with this KIA.

**THE CREATIVE
INDUSTRY
APPLIES NEW
KNOWLEDGE
AND, IN DOING
SO, REALIZES
INNOVATIVE
SOLUTIONS**

1.4.2 ATTENTION TO KEY ENABLING TECHNOLOGIES

The creative industry realizes innovative solutions through the structural application of technology. This value, the translation of technology into useful and desired solutions, is often overlooked by many tech developers. In Horizon 2020 the format of the Key Enabling Technologies is utilized to this end. In the top sector-wide agenda the NWO has made an analysis of the Dutch share based on this. The analysis of NWO offers useful starting points for the application of the creative knowledge base. In its further development, the roadmaps aim to connect accordingly.

The creative industry does more than just apply technology, however: by generating innovative applications, the sector also leads in technology development. We see this in the field of new bio-based and smart materials, for example. Creative professionals push the boundaries of technology by applying these materials to intelligent, adaptive products such as clothing and, in doing so, realize unexpected functionalities and experiences.

2



DEVELOPING THE KNOWLEDGE BASE

This KIA emphasizes the importance of a knowledge-intensive creative sector. The challenge for the creative industry asks for a creative professional that uses validated tools and methods to give direction to design and process.

It's the only way the professional can take full responsibility for the interventions that can drastically alter our lives and society.

2.1 A COLLECTIVE PUBLIC-PRIVATE APPROACH

The execution of this KIA happens through knowledge and innovation programs in accordance with the roadmaps. These programs are set up in such a way that the to-be-developed general knowledge base is reflected in and fed by applications in innovative solutions for societal challenges. This way, the programs tie fundamental research to applied and practice-oriented research and concrete innovation projects. That's why, in the set-up of the programs, we look for an optimal interactive combination of short-cycled innovation projects or case studies; where possible tied to field labs and longer-term research activities.

This KIA represents the collective interests of stakeholders from the industry, government and knowledge world. Because of this, we will look for public-private partnerships (PPS) in all cases. Partners will include researchers from knowledge institutes (universities and colleges), creative professionals from the creative industry and the broader business world, and "clients" or "problem owners" from the industry, non-profit organizations and government. The development of a PPS requires a careful balancing of individual and shared interests, both in the articulation of the question, as in its execution and implementation. In doing so, we will look for optimal utilization and combination of the available tools and programs; from public-oriented research funding to individual innovation stimulation (see paragraph 4.4.).

2.2 INHERENT AND INNOVATIVE RESEARCH METHODS

To strengthen and keep the creative professional's knowledge base up to date, research is vital. The different forms of research must lead to Key Enabling Methodologies (KEMs): methods and techniques that allow the creative professional, in all sectors of the creative industry and employable in varying domains, to do an even better job in the future.

**KEMS ENABLE
CREATIVE
PROFESSIONALS
TO STRUCTURE
AND VALIDATE
THEIR WORK**

Relevant research groups and institution that contribute to that knowledge base can be found in the alpha, gamma and beta fields. The spectrum of research methods thus spans across all the familiar forms of qualitative and quantitative research. A typical form of research for the creative industry is Research through Design (RtD), where the development and testing of a design or artefact is used as a tool to address research questions. Typical for RtD is the way in which a product or service's design makes connections between different fields of knowledge, and enables further advancement. This ties in with developments in research methods in other fields, such as the interventions in action research in the social sciences, and, more recently, design anthropology and enactive research. In the NWO call Research through Design, this research method has in recent years already been used to gain the necessary experience.

Another good example out of the creative industry is practice-based design: whereas RtD uses the design or artefact as a tool to obtain knowledge, practice-based design research centers the artefact itself. Through experiment, new applications of materials are investigated, a critique is given of today's world (so-called critical design), or future worlds are explored and imagined. This research method, based on designing or artistic practice, is increasingly finding application in the arts and designing disciplines and makes for a valuable addition to the arsenal of research methods used by researchers in the creative industry. The documentation of knowledge based on observation and

critical and comparative reflection is of vital importance for this type of research as well. It's the only way to contribute to the knowledge base of the entire sector.

2.3 LEADING TO KEY ENABLING METHODOLOGIES

Research outcomes – among which the Key Enabling Methodologies (KEMs) - can be captured in theories, strategies, models or process descriptions (roadmaps, phase models), but can also be stored in the creative concept or product. The product and its development thereby encapsulates the knowledge, and the challenge is to distill, abstract and generalize that knowledge, so that it can also be applied in another situation or sector. This form of knowledge development and transmission can also be found in the earlier mentioned Research through Design method.

KEMs enable creative professionals to structure and validate their work and have been thoroughly tested through research at knowledge institutes. In addition to being developed at colleges and universities, a lot of knowledge is also developed in practice and can therefore sometimes even specifically apply to a certain company or agency. Through testing and validation, that knowledge can be added to the general knowledge base of the creative industry. Elements from the knowledge base can be utilized at different moments in the innovation process.

Below is a classification of these KEMs, coupled with a number of existing and new tools and methods. This list is far from exhaustive.

1. Methods to determine direction and design goals, such as:
 - a. Tools and methods that help imagine new worlds, such as scenario-development, forecasting, design for debate;
 - b. Methods for mapping the (current) world, such as context mapping; business model canvas; experience sampling; thinking in systems;
 - c. Methods or techniques to approach problems or phenomena differently*, such as reframing and various creativity techniques;
 - d. Methods that help to develop a position or vision, such as value-sensitive design, normative framework.
2. Methods that help to systematically go through the process and involve stakeholders*:
 - a. Methods for evaluating or mapping the user-product interaction*, such as UX design, strategies for behavioral change, service design techniques such as customer journey mapping and service blueprinting;
 - b. Methods and techniques to help realize the end product, such as rapid manufacturing, cradle-to-cradle.

3. Methods that help with the elaboration and realization of the solution. This includes:
 - a. Methods and tools for shaping a concept or idea, such as modelling, prototyping, (virtual) simulations;
 - b. Methods for evaluating or mapping the user-product interaction*, such as UX design, strategies for behavioral change, service design techniques such as customer journey mapping and service blueprinting;
 - c. Methods that are aimed at a more specific interest, such as social innovation, design for emotion, sustainable design, strategic design.
4. Methods that support the testing and validating of an idea or solution. This includes:
 - a. Methods for testing concepts at an early stage*, such as information acceleration, beta testing, focus groups;
 - b. Methods and scales to measure the direct and specific effects of products, such as PrEmo personality scales, usability testing;
 - c. Methods that help us identify the long-term effects or societal value of solutions*, such as life-cycle analysis, Delphi method, field and simulation studies.

“IN CONTRAST TO WHAT MANY PEOPLE THINK, METHODS ARE NOT THERE TO GET TO A SOLUTION MORE QUICKLY, BUT TO SLOW YOU DOWN, TO AVOID JUMPING TO CONCLUSIONS.” KEES DORST

Before we can designate a single key strategy, technique or method to contribute to the mentioned transitions and challenges, research is required. This primarily applies to the categories with an *. Contemplative experiments, which, for example, are propositional or create interventions, are important for creating clarity in complex problem areas. They cause the creative industry to also become more important as an experimental sense-making tool in other sectors, comparable to how IT is a universal data and knowledge support.

For this new strategic role and position amid the other sectors, new KEMs will have to be developed, existing KEMs need to be deepened, evaluated and, in varying forms (S, M, L, XL) disseminated and embedded in other sectors.

In addition, the creative industry of course remains a sector in and of itself as well. A sector that is well-equipped to touch people and to entice them with meaningful interventions in areas such as fashion, media, design and architecture. The Dutch creative industry can build on years of experience in this domain and, in doing so, will increasingly present evidence-based solutions. This gives the Netherlands a great competitive advantage compared to other countries.



3

CONNECTING AND APPLYING THE KNOWLEDGE BASE

The TKI CLICKL wants to strengthen the knowledge base by connecting the application and the development of knowledge. Together, they will offer the possibility to learn and to experience how new knowledge is applied and how it can be tested and validated through case studies.

3.1 FLAGSHIPS FOR PUBLIC-PRIVATE PARTNERSHIPS

The abovementioned ambitions – for the creative professional to face the challenge in public-private partnership (PPS) with the development of appropriate research forms (Key Enabling Methodologies) for a strong knowledge base that contributes to innovative solutions for societal challenges – are worked on in flagships. In doing so, the creative industry takes the lead in concretizing and mobilizing the agenda. The goal is to start with a trio of PPS-projects early 2018.

Each flagship project focuses on one of the roadmaps and will address a need from a specific domain; the connection from right to left in the R&D-framework. To do so effectively, a larger industry partner that is leading in the context of the topic in question will be involved.

The concrete research methodology and the scientific inquiry will be developed in collaboration with the industry and the researchers. A process is thereby strived for that contributes to the reduction of “application pressure” for researchers.

The project ideally exists of a combination of:

- short-term feasibility studies or concept development (3-4 months), with a role for creative professionals (often in small or medium-sized companies)
- and long-term research (approximately 2 years), in collaboration with a consortium of researches from universities and colleges, for the development of the knowledge base and the collection and addressing of knowledge questions resulting from the short-term studies.

With regard to the described methodology, this fits in a financing model with a 50/50 public/private distribution, supplemented with PPS grant. (See paragraph 4.4.1).

CLICKNL BUILDS ON THE CONNECTIONS AND ACTIVITIES FROM RECENT YEARS

3.2 KNOWLEDGE DISTRIBUTION AND NETWORK FORMATION

Strengthening the knowledge base of the creative industry – the objective of this agenda and the main task of CLICKNL (see paragraph 4.1.3.)- can only be realized if a strong engagement by creative professionals and researchers from the field is present from the start. CLICKNL thereby builds on the connections and activities from previous years. Partners therein are the networks and communities in the sub-sectors of the creative industry, branch and umbrella organizations.

3.2.1 ROADMAP COMMISSIONS

The formulation of the roadmaps is the result of a series of expert sessions with the blood groups and stakeholders in the creative industry. Afterward, the roadmaps were further developed by three core teams. Yet to assemble roadmap commissions will take care of the roadmaps' further development. Frequent reviewing and adjusting will be necessary to develop progressive insight and to be able to address new demands. Additionally, it will be necessary to occasionally go into the content of specific topics more deeply. The roadmap commissions are a representative reflection of the work field. They will advise the CLICKNL board on the knowledge and innovation programming (see paragraph 4.4). In addition, the members of this commission are good starting points for communities with a larger participation from the work field.

3.2.2 COMMUNITIES AND EVENTS

Previous research programs have shown the importance of the active organization of a community. In the extensive CRISP program the research plans and results were discussed with creative professionals and clients in half-yearly Design Review Sessions. Early and frequent coordination between research objectives and practical demands not only leads to better navigation, but also to better mutual understanding.

In the future, various simultaneous and consecutive projects will be active within the roadmaps, with a variation in run-time, partners and participating professionals. Crosspollination between the research lines and projects is important for fostering synergy. CLICKNL will therefore continue the existing cycle of two yearly events (CHARGE and DRIVE) and thereby focus on the roadmaps. In doing so, CLICKNL strives for diversification of the participants in these events. Not just in the knowledge institutes, where the width of the humanities and social sciences make for an important addition, but also in the work field and the width of all the disciplines it contains. Furthermore, attention will be needed for the demands of younger generations of researchers and creative professionals. CLICKNL therefore also supports small-scale gatherings with a strong emphasis on knowledge exchange.

A third form of physical gatherings are the matchmaking conferences. In line with the KIA framework, public organizations (such as NWO, SIA and RVO) will organize programs and calls that researchers and creative professionals can make use of. In order to foster collaboration and to enable parties to find each other, CLICKNL will support match making conferences.

3.2.3 PLATFORM PHYSICAL AND ONLINE

The CLICKNL website was recently completely renewed with a stronger focus on R&D in the creative industry. In addition to examples, programs and backgrounds, the website, in combination with social media platforms, will serve as a portal to the developed and available knowledge. Through the website but also by supporting matchmaking conferences, CLICKNL facilitates the connection between

programs, new calls and the communities. Additionally, its social media offers the community the possibility to actively respond and participate in the communication.

3.3 CROSSOVERS

In order to contribute to the societal challenges, CLICKNL seeks out collaboration with the other top sectors (see paragraph 1.3) and governments. Think of healthy nutrition with the top sector Agri&Food and healthy urban environments with the top sector Horticulture and Starting Materials. CLICKNL thereby functions as matchmaker and program developer, supported through regulations such as the PPS and MIT programs.

CIRCO: creating business through circular design

A successful example of the role the creative industry plays in the strengthening of a transition, is project CIRCO, commissioned by the Ministry of Infrastructure and Environment. CIRCO accelerates the development toward a circular economy, with design (methodology) as its engine. Companies and designers work together on concrete circular businesses and share experiences, knowledge and inspiration with a broad network. The manufacturing industry is mobilized there and helped with the development of a new proposition; business case, product and service. CIRCO “creating business through circular design” has become a movement, fed by the growing community of entrepreneurs and companies from the manufacturing industry and the creative industry, and researchers, policy makers and students. The methodology of the CIRCO Tracks and Classes was developed by the CIRCO core team and is executed in collaboration with the CIRCO Trainers Network and various branch and regional organizations. CIRCO was launched in 2015 and is partner of the entrepreneurs network Nederland Circulair (Circular Netherlands).

In the past, CLICKNL has frequently worked together with other top sectors through crossovers. For instance, together with the top sector Life Sciences & Health, work was done on the program Create Health, and with the top sector Energy – via the Green Deal Smart Energy Cities – work was done on development of carried solutions for energy conservation on district level.

3.4 REGIONAL AGENDAS, LIVING LABS AND FIELD LABS

In the Netherlands regions are an important intersection for application development and innovation. Not only through the regional agendas (and corresponding resources), but also through the strong connections that colleges have traditionally (but not exclusively) had in the region. Entrepreneurs often operate on a larger scale than just inside the region, but they have strong ties to governments, schools and facilities in the region.

Regional agendas for innovation are increasingly focusing on the societal challenges and specific application domains. In the European R&D financing there is a growing focus on regional strengths.

Gaining experience with the application of knowledge and innovation is important in the creative industry. Living labs and field labs are attractive working methods for developing and testing new applications in short-term projects. Through Innofest festivals are used as living

LIVING LABS AND FIELD LABS ARE ATTRACTIVE WORK METHODS FOR DEVELOPING AND TESTING NEW APPLICATIONS IN SHORT-TERM PROJECTS.

laboratories to test new innovations in the field of energy and waste. Open House, the open innovation platform of ID&T, works together with the Red Cross on festivals to help tackle societal challenges such as immigration and security.

In 2017, CLICKNL started supporting a number of field labs and this will expand in coming years. By giving the creative industry access to more room for experimentation, new concepts and applications will emerge and more will be invested in R&D by the sector.

Three fieldlabs which CLICKNL supports:

SAX

In the SAX program research is done into innovative concepts that contribute to improvement of the experience and engagement of visitors and remote fans during large-scale events. It explores new spectacular forms of events and looks at how the data that is generated by users and the location/event can be utilized to make new services possible.

UPPS

Field Lab UPPS (Ultra Personalized Products and Services) was created to stimulate innovation that capitalizes on the opportunities of the 4th industrial revolution. Its ultimate objective is to create a Dutch industry in which personalized products are realized on a large scale. The focus will be on three areas: sport, health and fashion.

VIRTUAL WORLDS

In the Field Lab Virtual Worlds virtual environments are utilized to solve mainly societal challenges and to gain new insights and knowledge in the process. Think of new forms of storytelling, 3D reconstructions, new ways of making expositions, journalism, and a new experience of spatial and industrial heritage.

3.5 LIFELONG DEVELOPMENT

Disruption and transformation caused by technology and digitalization put our ability to adapt to the test.

“Future-proofness” – lifelong development – therefore is defined as a key skill in the Human Capital Roadmap Top Sectors. Human knowledge and skill, the human capital, is a critical success factor in the (economic) growth of every top sector. To maintain and increase this human capital, top sectors focus on the development and attraction of talented employees from the Human Capital Agenda.

**DISRUPTION AND
TRANSFORMATION
CAUSED BY
TECHNOLOGY AND
DIGITALIZATION
PUT OUR ABILITY
TO ADAPT TO
THE TEST**

The series of four, Learning Communities 2018-2022, of the Human Capital Roadmap Top Sectors outlines the top sectors' desire to jointly give shape to lifelong development through so called Learning Communities. These are essential for stimulating research, work, innovation and learning, specifically by connecting them to each other. Learning, then, is no longer bound to just conditional learning (learning prior to the professional practice), but deepens reactive learning (learning so as to be able to handle changes, both through informal learning and formal learning, such as a training) and stimulates and develops mainly pro-active learning (learning amid a transformation process). An experimental approach of learning by doing, the trial and error method, is central in this. This ties in to the working method of the field labs in the previous paragraph.

The Learning Communities' research agenda has been outlined based on ten themes. The roadmap Value Creation from this KIA for the creative industry in particular contributes to answering the research questions that are raised around these themes. Through knowledge development and its application in field labs, the KIA also contributes to the suggestions the Council of Culture (Raad voor Cultuur, RvC) and the Social Economic Council (SEC) make in the advisory report *Passie Gewaardeerd* (Passion Appreciated).



R&D-ECOSYSTEM

The designation of the creative industry as a top sector in 2011 has had a tremendous impact. The Top Team Creative Industry was formed to advance collaboration between businesses, knowledge institutions and government.

In addition, the advisory council Dutch Creative Council, the overarching organization of branch unions Federation Dutch Creative Industries and the Top Consortium for Knowledge and Innovation, was founded. Around the same time, the Stimulation Fund Creative Industry was formed out of a fusion of various public culture funds, and from a fusion of three cultural sector institutes Het Nieuwe Instituut (The New Institute) emerged. With these developments the creative industry has put itself on the map as a sector.

This chapter outlines the R&D ecosystem of the creative industry: the organizational structure from which CLICKNL realizes its goals and ambitions. Additionally, it shows who the most important stakeholders involved are.

4.1 SECTOR CREATIVE INDUSTRY

With this KIA CLICKNL mainly focuses on creative professionals and companies that are willing to invest in R&D. These creative professionals can be working in the creative industry, but also other sectors.

4.1.1 CHARACTERIZATION

The creative industry is a source of applied creativity, ranging from fashion to architecture and from gaming to dance. The sector utilizes that creativity in the development and marketing of innovative products and services, from dresses to tv-formats and from app to building. The creative industry distinguishes itself in its working methods: a creative professional puts the needs of the user first and, among other things, makes use of imagination and xprototyping (see also Key Enabling Methodologies, chapter 2.2) to make the result tangible from the start. Because of this, the creative industry is capable of un-

derstanding complex (societal) challenges and generating unexpected solutions, in which the newest technologies are often used.

Creative entrepreneurs work in:

- Creative commercial service
- Media and entertainment
- Arts & culture

The creative industry has a dynamic character. In addition to a smaller number of large companies, the industry mainly exists of SMEs and freelancers. They work in flexible, international networks that allow the sector to innovate and quickly respond to new developments. Missing knowledge or competences are found through networking with other companies.

4.1.2 FACTS AND NUMBERS

A sector with such a dynamic also has its risks: in recent years, the number of companies has risen significantly more than the number of employed people. This scaling down goes hand in hand with a loss of productivity and added value and is causing creative entrepreneurs to often have little time, capacity and financial resources for a future-proof development of their product, company or co-workers. Furthermore, according to the Social Economic Council (SEC) and the Council for Culture (CfC), job market conditions of many workers in the cultural sector are troubling. Many employee's jobs have disappeared and the traditionally large number of freelancers has risen

further. The rate in which this is occurring varies between sub-sectors. Traditional financing instruments are often not accessible due to the size or nature of creative companies. Conversely, the creative industry is a frontrunner in the development and utilization of alternative financing models such as crowdfunding (like Kickstarter or Voordekunst) or microcredits (like Qredits).

THE DUTCH CREATIVE COUNCIL ADHERES TO THE FOLLOWING CORE NUMBERS:



144.100

COMPANIES (11% OF ALL COMPANIES IN THE NETHERLANDS), AND 186.000 FTES (2,6%)

MORE THAN

40%

FREELANCERS, AND IN ADDITION PRIMARILY SMES

2,3% P/YEAR



AVERAGE GROWTH BETWEEN 2005-2015 OF 2,3% PER YEAR (AGAINST A NATIONAL AVERAGE OF 0,4%)

RESPONSIBLE FOR 1,8 % GROWTH OF THE GNP PER YEAR

1,8%



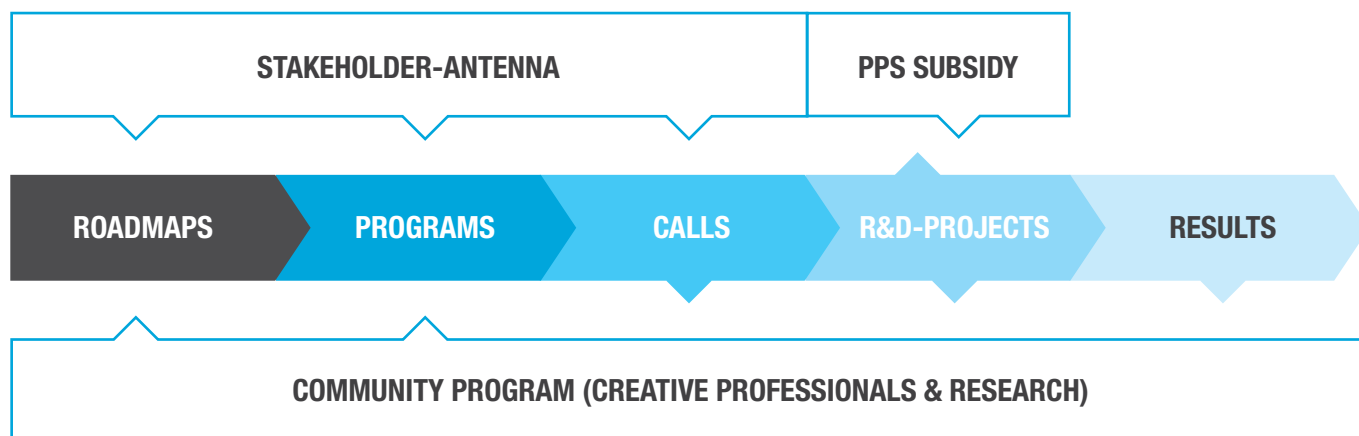
YEARLY REVENUE OF

€16.800.000.000 (2,8% OF THE GNP)

SURPLUS VALUE OF

€ 11.802.000.000 IN 2015





MORE INFORMATION:

- The Federation Dutch Creative Industries has published an overview online of the creative industry in the wssNetherlands: from key field to top sector.
- The CBS (Central Agency for Statistics) offers a dashboard in which data about the top sectors are listed and can be compared in the monitor top sectors.
- The iMMovator Foundation publishes the Monitor Creative Industry.

4.1.3 CLICKNL

CLICKNL strengthens the knowledge base of the Dutch creative industry and, in doing so, contributes to a strong sector. It does so by advancing the development of new knowledge and the application of knowledge for innovative

solutions. CLICKNL thereby focuses on the stimulation of public/private partnerships, which provide societal as well as economic value.

CLICKNL represents the added value of partnerships and connects curious researches to entrepreneurial creative professionals. Together they develop knowledge and innovations for a strong economy and a sustainable society. For and with the partners in the R&D ecosystem, CLICKNL focuses on:

- formulating and maintaining the roadmaps
- building R&D programs
- unlocking results

CLICKNL therefore has a strategic networking and antenna

function for the stakeholders and partners in the field, through a community program takes on an informing and awareness-raising role for creative professionals and excellent researchers in the top sector and executes the PPS regulation that is used to obtain additional financing for R&D.

The substantive representation of the creative professionals from the industry and of the entrepreneurial researchers from the knowledge institutions in the activities of CLICKNL, occurs in roadmap commissions. These will be formed based on this KIA.

4.1.4 PARTNER ORGANIZATIONS

The activities of CLICKNL and the realization of a strong knowledge base ask for close collaboration with the representative organizations in the field. The Federation Dutch Creative Industries combines the strengths of important branch organizations in the sector. CLICKNL develops close collaboration with the Federation Dutch Creative Industries and its members: Modint, BNA, BNO, BNI, DGA, DDA, VEA.

In addition to knowledge and innovation, internationalization is an important topic on the agenda of the Top Team. The organization Creative Holland, specifically founded to this end, is a sister organization in the sector.

The networks that formed the basis of CLICKNL, continue to grow into strong knowledge and innovation networks of the sub-sectors – in some cases coupled with branch organizations and/or knowledge institutions. In addition

to the sector-wide agenda of CLICKNL, these networks develop specific agendas and programs, matching the questions and challenges in that sector.

The aforementioned roadmap commissions form the platform on which the overarching topics can be addressed.

4.2 KNOWLEDGE PARTNERS

This KIA is an explicitly multi-disciplinary agenda and the challenges ahead demand collaboration between alpha, gamma and beta scientists. Additionally, there is full compatibility with the agendas of various TO2-institutions.

4.2.1 UNIVERSITIES AND COLLEGES

Knowledge partners that contribute to the objectives of this KIA will be invited to participate in research and innovation for and with the creative industry. This can be done through the instruments that we outline in paragraph 4.4. Naturally, we thereby think of the creative and designing disciplines at universities and colleges, like the Centers of Expertise (CoE) for the creative industry, studies of the arts and studies in the domains of human technology, industrial design and engineering at the technical universities. However, in addition to these usual suspects, this agenda also asks for involvement and input from researchers from the social sciences (such as psychology, communication sciences, business administration), the humanities (media studies, philosophy, digital humanities) and technical sciences (mainly ICT).

4.2.2 T02-INSTITUTIONS

Organizations for Applied Research together form the link between knowledge and innovation in service of government, business and society. They generate solutions for societal issues, which lead to a better competitive position of the Dutch economy and a safe, sustainable living environment for the citizen.

T02 institutions are: Deltares, ECN, MARIN, NLR, TNO and WUR/DLO. The agenda of the creative industry has overlap with, among others:

- Portfolio analysis: promising innovation assignments for the Netherlands. In this analysis TNO has, together with the Ministry of Economic Affairs, defined ten innovation assignments as concrete demands of societal players (companies, governments and citizens), that ask for a knowledge breakthrough, new technology or behavioral change. A renewal assignment is a cluster of innovation assignments.
- Strategic Agenda 2018-2021 from Wageningen Research (WUR/DLO): among others the thematic line social innovation for value creation.

4.3 GOVERNMENT

In realizing the ambitions of the top sector, the government also plays a role as partner and a regional role, in addition to its role as financier and catalyst for scientific research and innovation (see chapter 4.4)

4.3.1 GOVERNMENT AS PARTNER

The government also plays a role, perhaps even a primary role, as a partner when it comes to the societal challenges and the desired transitions. For instance, the creative industry is involved in sustainability challenges from the Ministry of Infrastructure and Environment, and in challenges regarding behavior around the energy transition at the Ministry of Economic Affairs.

Here, the government has the role of customer for companies, and sometimes also of launching customer, by purchasing circular textile for company clothing, for example. The signing of covenants with the government also leads to innovative solutions. An example of this is the Green Deal Smart Energy Cities, where work is done on the development of popular solutions for energy conservation on a neighborhood level.

CLICKNL FOCUSES ON THE STIMULATION OF PUBLIC/PRIVATE PARTNERSHIPS

THERE ARE DIFFERENT TOOLS FOR THE FUNDING OF KNOWLEDGE AND INNOVATION

4.3.2 REGIONAL STRENGTHS

Regional governments pay a lot of attention to regional strengths and their advancement.

This is increasingly being connected to societal – regional – challenges. Sub-sectors of the creative industry also tie in with this, for example through fashion in the region surrounding Arnhem, design in the region surrounding Eindhoven and media in the region surrounding Hilversum.

4.4 TOOL SET

Different tools exist to fund knowledge and innovation for and by creative professionals. Below is an overview of the most important ones. The amount of available funding is, among others, the result of the negotiation between Top Team, CLICKNL and various partners. Its result will appear in the Knowledge and Innovation Contract (KIC) every two years.

4.4.1 PPS GRANT

The TKI CLICKNL aims to strengthen public/private partnerships in research and innovation in the creative industry. This includes, among others, the so-called PPS grant Research and Innovation. TKI CLICKNL can apply for the PPS grant with the Netherlands Enterprise Agency (RvO) to help fund public-private research projects. The PPS can lead to a grant of 25% of the private contributions for each research project. The contribution of SMEs is even supported with a raised percentage of 40%. In order to apply for a PPS grant, project partners must submit a project proposal to CLICKNL. In the past two years, the awareness around the possibilities of this arrangement has increased among knowledge institutions in the creative industry, and its use has increased. In addition to the programmatic utilization of the PPS grant by the TKI itself, the project grant also contributes to the strengthening of the knowledge base. In the coming period, CLICKNL will pay particular attention to the utilization of this arrangement, because it perfectly connects to the strong SME representation in the sector.

4.4.2 NWO AND SIA

The Dutch Organization for Scientific Research (NWO) ensures quality and innovation in science and fosters its impact on society. Its main task is to fund scientific research and research facilities at Dutch public research institutes, particularly universities. The National Coordinating Body Practice-Oriented Research SIA funds and stimulates practice-oriented research performed by colleges. The coordinating body is a part of NWO. The practice-oriented research is aimed at creating new applicable knowledge and to disseminate it to education and professional practice. The Knowledge and Innovation Agendas of the top sectors and societal challenges are taken into account when programming the research.

4.4.3 EUROPE

With a budget of 80 billion euros, the European program Horizon 2020 is the world's largest R&D program and comprises a broad variety of themes. The current program (also known as the 8th framework program) will run until 2020; the 9th framework program will be developed in the coming period and will start late 2020. In the Netherlands, the RVO is the national point of contact for this program. RVO has made an analysis of the opportunities and possibilities for the Dutch top sectors in Horizon 2020. Particularly the Societal Challenges – in line with this KIA – offer room for the specific methodology of creative professionals. There are possibilities in, among others, the Horizon 2020 work programs:

- Health, Demographic Change and Wellbeing
- Secure, clean and efficient energy
- Smart, Green and Integrated Transport
- Climate action, environment, resource efficiency and raw materials
- Europe in a changing world – Inclusive, innovative and reflective societies

What's promising is that in Europe, the concept design driven innovation is seen as a successful approach to social and human centered innovation.

Additionally, there is a number of targeted opportunities in the more technologically driven Leadership in Enabling and Industrial Technologies (LEIT) work programs, as in Information and Communication Technologies (ICT).

DESIGN DRIVEN INNOVATION IS IN EUROPE SEEN AS A SUCCESSFUL APPROACH TO SOCIAL AND HUMAN CENTERED INNOVATION

4.4.4 SME INNOVATION STIMULATION REGION AND TOP SECTORS (MIT)

With the SME Innovation Stimulation Region and Top Sectors (MIT) program top sector Creative Industry, the Ministry of Economic Affairs encourages SME entrepreneurs to collaborate inside the top sector and to innovate for innovations in other sectors. The program supports SMEs with subsidies for knowledge vouchers, advisory projects, feasibility projects and R&D partnership projects. The large representation and the cut-through character of the creative industry makes this an appealing program.

4.4.5 STIMULATION FUND CREATIVE INDUSTRY

The Stimulation Fund Creative Industry is the culture fund for architecture, design, digital culture and all possible crossovers. The Stimulation Fund aims to make a significant contribution to the quality of the professional design practice within and especially between the disciplines architecture, design and digital culture. Part of this endeavor is the interdisciplinary interaction between the cultural, societal and economic domains. The Stimulation Fund supports special and innovative projects and activities by designers, makers and cultural institution in the creative industry.

4.4.6 OTHER FUNDS

In addition to the abovementioned tools, there are numerous (private and public) funds that contribute to the strengthening of knowledge and innovation for and by creative professionals. An example of this is the SIDN fund that fosters a strong internet for everyone. They support projects and ideas that contribute to the strengthening of the internet, empowering users, and “Tech for Good.”

The foundation Culture + Entrepreneurship offers an overview of funding possibilities in and for the cultural sector. This foundation also administers the culture loan through the culture financing fund.

FRAMEWORK

KNOWLEDGE &

INNOVATION

AGENDA

A man with a beard and glasses, wearing a blue lab coat, is pointing his right index finger upwards. He is looking up at the finger. The background is dark and textured.

FRAMEWORK KNOWLEDGE & INNOVATION AGENDA

**DEVELOPING THE
KNOWLEDGE BASE
OF THE CREATIVE
PROFESSIONAL**

**DESIGN
FOR
CHANGE**

**VALUE
CREATION**

**THE
HUMAN
TOUCH**

*KEY ENABLING
METHODOLOGIES
(KEM'S)*

**CONTRIBUTING TO
SOLUTIONS FOR SOCIETAL
CHALLENGES**

**APPLICATION TO
CHALLENGING DOMAINS AND
KEY TECHNOLOGIES**

**CIRCULAR SOCIETY
HEALTHY BEHAVIOUR
RESILIENCE IN SOCIETY
ENERGY & BEHAVIOUR**

**QUALITY OF LIFE &
WELL-BEING
TRUST & SECURITY
PERSONAL EXPERIENCE
HUMAN EMPOWERMENT**

*INCLUSIVE &
INNOVATIVE SOCIETY*

HEALTHCARE

FOOD

ENERGY

MOBILITY

CITIES

RETAIL

**MEDIA &
ENTERTAINMENT**

HERITAGE

**KEY ENABLING
TECHNOLOGIES
(KET'S)**

PART 2

ROADMAPS

DESIGN FOR CHANGE



THE HUMAN TOUCH



VALUE CREATION

ROADMAPS

This is a first exploration of the elaboration of the three roadmaps for the knowledge base of the creative industry, as described in Part 1. Part 2 is a point of departure for the three roadmaps Design for Change, The Human Touch and Value Creation. The roadmaps are living documents and will regularly be subject to revision, based on the latest developments in the field and progressive insight. A detailed elaboration will be compiled by the roadmap commission. They will be appointed by CLICKNL.

These roadmaps are not finished research programs. Instead, they offer inspiration and are a first draft for such a document. The research questions that are raised are not attributed to a single discipline or specific scientific domain, but illustrative, guiding questions.

The roadmaps and sub-themes were given shape during the various (expert) sessions. During each subsequent session they were assessed, filtered and refined again. The connections between the roadmaps and the NWA routes are mentioned in chapter 1 and will not be repeated in Part 2. The links will be made explicit in the further elaboration of this exploration.



5

ROADMAP DESIGN FOR CHANGE

STRATEGIES FOR MOBILIZING PEOPLE BY INFLUENCING, MOTIVATING AND STIMULATING BEHAVIOR.

5.1 INTRODUCTION

The Inclusive and Innovative Society asks for a deliberate disruption on a system level; on the level of the coordination between the technological and human elements that constitute our modern society.

The collective awareness that we have to be more energy efficient and have to shift toward alternative green energy sources is present, but the knowledge on how the behavior of the individual citizen can be influenced by “the system” is lacking. On an individual level, the knowledge area of the social sciences offers numerous strategies for effectively influencing people’s behavior in a desired direction. However, the presence and influence of other human and technological elements on micro, (the small group) meso, (the community) and macro (the society) level give rise to complex system interactions. Together, these cause the desired societal net effect to stay absent. The overarching knowledge question that the Design for Change (DfC) roadmap focuses on, therefore is how creative

professionals, in close collaboration with other domain-specific experts, can design system interventions that can effectively tackle and eventually solve the great societal challenges on meso and macro level.

In order to design on this level, a completely different approach is needed than the current conventional approach within the creative industry. In the past decennia, creative professionals have increasingly started to adopt a more human-centered approach to design: an approach that is perpendicular to designing on a system level. Rather, it is an example of methodology that focuses on the micro level: the end-user is central. In order to be able to design for a meso or macro level, the “system needs” must be mapped. How do individuals contribute to the dynamics in the system?

Explorations with professionals from the creative industry and conversations with Dutch top researchers all indicate that the central role of the creative professional in the

design process is changing. Not just the implementation itself is designed together with the stakeholder and the assessment framework; nowadays, the creative professional is often involved in earlier and later stages of the process. With smart design interventions, they are involved in both defining the initial challenge and in the continual monitoring and possible adjustments over time. A continual feedback loop must emerge between design, intervention, measurement and assessment. This asks for new processes and tools that are more catered to research and experiment. The design in a project will change in design within a continual process of iterations; the so-called permanent beta. These continual processes ask for different definitions of success: how can the effect of an intervention be measured? This roadmap handles these questions.

5.2 RESEARCH DIRECTIONS FOR THE KNOWLEDGE BASE

In this paragraph we discuss the research directions that form a further explanation of the roadmap Design for Change. These sub-themes point to important challenges for design researchers and the type of research.

5.2.1 DESIGN FOR BEHAVIORAL CHANGE

- Which universal strategies and mechanisms for influencing behavior are effective?
- How do you map an existing system and determine where and when to intervene to achieve the desired effect?
- How are the values (the normative framework) determined that underpin a new system, and how are they documented?

A lot is known from the social sciences about strategies and mechanisms for effectively influencing behavior. However,

AN UNDERSTANDING OF BUSINESS MODELS AND VALUE NETWORKS IS IMPORTANT FOR EMBEDDING IDEAS IN PRACTICE

this research is strongly focused on the individual, and less so on the question on the effectiveness of (a combination of) these methods' scores on micro, meso, macro level of a complex sociotechnical system. Conversely, in the technical sciences, there is specifically more known about the properties and the behavior of complex dynamic systems. Complex systems can increasingly be modeled more accurately, making behavior more predictable and even producible. This mainly concerns complex systems that exist of technical elements. Once human elements start to be part of these systems, the challenges increase an order of magnitude in complexity; human elements are a lot harder to model. With this new factor, the technical researchers are also faced with new research challenges concerning predictability and manipulation of behavior. To find answers to the role of complex societal challenges, we must look at the different facets that together have led to the challenge.

Creative professionals and design researchers must work together with top researchers in the mentioned disciplines to obtain new knowledge which allows the creative industry in the Netherlands to design complex sociotechnical systems. These can be cultivated over time to actually and effectively tackle the great societal challenges. Additionally, the creative industry must develop knowledge of how these systems can be studied and how they can be mapped, so that it can be harnessed by the creative industry. This not only applies to the technical system, but also to the relations between stakeholders in the system. An understanding of business models and value networks

is important for embedding ideas in practice. Partnership between various parties, each having their own motivations and interests, is a condition inherent to system design. Currently, these partnerships are not self-evident and certainly not without friction. The creative industry can add value by forming the bridge between stakeholders and by making comprehensible for everyone how new solutions can be found. The roadmap Value Creation goes into this subject in more detail.

An important topic in the design of systems is responsibility and ownership. How do we determine what the desired change of behavior is? What role does the designer play in this? In recent years, these questions have been frequently addressed in the NWO program Socially Responsible Innovation (MVI). Concerning phenomenon and objective, MVI and this part of the Kia have a lot in common: both focus on societal impact through responsible utilization of technology. However, they differ in framework and perspective and, in doing so, serve different scientific areas. MVI mainly focuses on establishing and reflecting on a normative framework: which values are addressed by a system, and how? In that way it gives direction to that which is desired. For the creative industry, the operational framework is crucial: which tools and methods (the KEMs) can a creative professional deploy to give expression and shape to the desired direction? The two perspectives are complementary and combined can make the difference in the desired transitions.

5.2.2 TOWARDS TRANSITION

- Under which conditions are disruptive changes embraced (or not) and how do we migrate from an old to a new system?
- How do we handle ownership of a system and what does that mean for the business models within it?

Transitions are large scale changes that happen disruptively. They impact day-to-day life. By definition, transitions are the result of mutually interacting forces from different domains; social, technological and organizational. In that sense, transitions and systems are akin; one could pose that a system (purposefully designed, or more or less emerged from the combination of parallel developments) is the driving force or the result of a transition. That indicates the almost existential question for the creative professional: can a system be designed and can you design a transition? In addition to the ethical issues, these are also questions about reach and feasibility.

In order to create impact, one could pose that systems need to be developed. That design will then be more encompassing than the exclusively somewhat technocratic conception, and will exist of more than just the physical and virtual solutions. It thus also concerns interventions, campaigns and opinions; stimuli that influence the transition. Questions therefore are about the relationship between the components and partial solutions (micro), systems (meso) and (circular) society (macro).

A second important dimension is the question about the possibility to design and steer a transition, or feasibility. When it concerns a desired, by people designated, growth, the system will ideally have to be able to adapt to changing circumstances. Seeing the complexity of the system and seeing the expected adjustments of the desired goals over time, however, it remains to be seen if this technical problem can be solved within a reasonable timeframe. Therefore, the design, realization, monitoring, cultivation, intervention and adaptation of system elements will, for a longer period, belong to the creative professional's area of expertise.

Approaches like those used in co-design and participatory design, are useful to build support for disruptions. Stakeholders are involved in a participatory process to prevent them from deciding for the group. The process can support stakeholders in making their own choices and taking responsibility for them.

5.2.3 PREDICTION & ADAPTATION

- How can we predict, permanently monitor and measure societal impact?
- In doing so, how do we handle uncertainty of predictions?
- What role does data play in the development and continuous updating of a system?

Currently, measuring, monitoring and predicting the behavior of complex sociotechnical systems currently is not part of the default tool set of the creative professional. New knowledge-based tools and methods will have to be developed to equip the creative professional for the new activities and roles. Data will play a big part in designing complex systems that will make desired societal changes possible. Creative professionals feel and express the (urgent) need for an information-based creative view on data.

It's hard to fully predict and model the way in which sociotechnical systems will behave. As soon as people are part of a system, we can only to a limited extent (mathematically) approach what the impact will be of an intervention. An argument for the necessity for modelling interventions is that such developments can only be tested in practice. More certainty is desirable before the implementation. A useful approach could be to develop interventions in collaboration with stakeholders, and to assess these in practice and in the long term. Eventually, this should lead to generally appreciated and accessible evaluation methods, including evaluation methods for the

long term. Only by using these can we start to build a library of evidence-based case studies with examples of effective behavioral change, which will make sustainable innovation easier to adopt in the future.

5.2.4 RESISTANCE TO CHANGE

- Why do we encounter resistance to change with government, public and industry?
- How can this resistance be breached?

At a macro level we see challenges in business and government to give the citizen or consumer a meaningful role in the development process. Sometimes people, unpredictable as they can be, are even seen as a barrier for change. aaaaA library of successful and validated case studies could convince policy maker, strategists and managers. Prove of impact of interventions in the long term can promote a mindset that looks beyond the immediate financial gain, and which puts ethical and sustainable advantages for society and the world in general first. This can bring about a more precise and strategic approach to change. In a situation where we are under pressure, both in terms of time and scale, such a library can offer reassurance for the industry with regards to design for (behavioral) change strategies and methods.



5.3 SOCIETAL CHALLENGES AND THE ROLE OF THE CREATIVE INDUSTRY

In this paragraph the societal challenges around health care, energy, resilience and sustainability, which are substantively connected to the roadmap Design for Change, are further elaborated. Illustrative of the connection between these societal challenges are the plans of Sadiq Khan, mayor of London, to curtail the use of cars in the inner city. “We have to make not using the car the affordable, safest and most convenient option for Londoners.” The motives Khan mentions for doing this, relate to several of the societal challenges we deal with in this roadmap. “The population of London will soon rise above 10 million. In order to be able guarantee our health and prosperity in the future, we need to bring down the extent to which we are dependent on cars.” Also interesting are the various activities that are being undertaken to set this change in motion. For instance, both pricing mechanisms are being mentioned (pay-per-mile road pricing), which calls out consumers on their behaviour, and changes in the environment (no parking lots, streets more catered to walking and cycling, more space for safe bicycle deposits and charging points for electric cars.).

DEVELOPING BUSINESS MODELS FOR CIRCULAR PRODUCTS AND SERVICES

What remains unclear in Khan's article is the way in which these interventions will have consequences for different groups of people in the city. Will undesired effects emerge as a result of certain interventions? Are the interventions jointly enough to achieve the desired effect? Is there enough support for these interventions or will they result in a lot of resistance? It's the creative professionals that are uniquely equipped to design a score that can be read by all the players in the system. A score that is designed in such a manner, that interventions in complex multi-stakeholder networks can be constructively discussed, concretely implemented and successfully executed. In doing so, the creative professional gets a clear role pertaining to design decisions that describe how the transition to another system can be shaped.

5.3.1 CIRCULAR SOCIETY

The circular economy touches several disciplines and industries. Both in the area of partnership models, as in the area of technical development, creative professionals have a lot to offer.

The circular economy is an economic system meant to maximize the re-use of products and raw materials and to minimize value destruction. It departs from the point of conservation of natural resources. In contrast to the current linear economic system, in which raw materials are turned into products that are destroyed at the end of their lifespan, the circular economy strives for value creation in every phase of the system. In doing so, the circular economy has become imminent.

The two great themes within the circular economy are the energy question and recycling, re-use, or retaining the value of products. Regarding materials, the circular system knows two cycles: a biological cycle, in which residue material safely flows back into nature after use, and a technical cycle for which products (parts) are designed and marketed in such a way that they can be re-used in on a qualitatively high level. This conserves the economic value as much as possible. The creative industry plays a role in the field of circular material development.

In addition to circular materials, creative professionals can also help with the circular design of products and service flows from the start, or change these into circular flows. This can give an impetus to the Dutch manufacturing industry and recycling branch. In collaboration with civic parties, the Dutch government started a program to make their daily operations circular: Van Afval naar Grondstof (From Waste to Resource). The Netherlands recycles 79% of its waste. In order to also achieve that last 21%, both technological and production processes as well as the social and economic systems can be carefully explored. By revising all components again, existing habits may change so that the circularity becomes embedded on a national, company, as well as individual level.

On a system level there are a lot of unseized opportunities by developing tools, methods and models. Concepts such as using buildings as storehouses in which building materials for the future generations can be stored, deserve

ON A SYSTEM LEVEL THERE ARE STILL A LOT OF OPPORTUNITIES TO BE SEIZED, BY DEVELOPING TOOLS, METHODS AND MODELS

a lot more attention. In the conversation with users there is a lot still to gain to get them to think differently about the circular economy. How do we have the conversation in such a way that users make different product choices: products that are produced more energy neutral and that can be recycled or even taken up in nature again, long after their lifespan? In which manner are they inclined to test new concepts? How do we make the transition from possession to usage? Examples of services such as Peerby and car sharing appeal to the imagination.

The most urgent question in which the creative industry can play a role, is circular value creation. How do you develop business models for circular products and services? Questions regarding value, parts and materials in different use phases therefore need to be addressed, as well as the reason for seizing the use. Knowledge about this can subsequently be harnessed in the development of circular products and services. Closely tied to these questions is the role of the user or consumer. How do you create a good value proposition for the user? How can you entice the user into circular behavior and how can you change their behavior? The circular business model will have to be profitable for the producer and appealing to users. In the development toward a circular economy, there is a



need for people who understand design, the user, engineering, and the concept of circular economy. The creative professional can take on the role of connector and chain manager, due to the broad perspective inherent to his/her discipline. Combined with the creativity that's inherent to the creative industry, unexpected solutions can come about. Working with a circular design approach,

the creative professional can make circular development processes concrete and guide them.

Currently, multiple projects are being developed that market circular products through material innovation, by using waste flows as resources, or through a think tank structure in which companies partner with the creative industry to alter the way they do business. Additionally, the adding of services to existing products or sectors and the transition of possession to usage are important areas of development. The CLICKNL program CIRCO works together with the manufacturing industry: it's mobilized and helped with the development of a new proposition for a circular economy; a business case, product or service. In doing so, it accelerates the development toward a circular society, with design (approach) as the engine. In CIRCO companies and designers work together and share gained experiences, knowledge and inspiration with a broad network. CIRCO began based on the TU Delft framework 'Products That Last'. With two years of partnerships behind it, the program has yielded good insight into what's lacking in terms of knowledge. This forms a point of departure from which new knowledge can be developed.

Late 2017, the roadmap Circular Economy for the Creative Industry will further map out where and how the creative industry can play a role in the development toward a circular economy. It will discuss holes in the knowledge base that need to be filled in, if the creative industry wants to play that role.

5.3.2 HEALTHY BEHAVIOUR

What behavior can we think of when it comes to health? The answer to this question is not unambiguous and the question can therefore best be looked at from a several different angles. When it comes to prevention, of illness and deficiency, both individual and economic interests play a vital role. For example, by altering people's eating habits, diabetes can be prevented, which will cause the future costs for this illness and the necessary health care to drastically be reduced. It may also concern exercise, for example to get children glued to the tube to play outside again, to breach the sedentary lifestyle of office personnel, or to foster vitality among the elderly. In all these instances, the motto is: prevention is better and cheaper than curing. In that regard, it must be said that the definition of 'health' in recent years has shifted from a focus on illness to a focus on the individual and (wo)man's capacity to adapt and take control him/herself; vital functioning. How can smart systems help them with this? And when we talk about habitat; it's increasingly becoming clear that the spatial arrangement of our cities and the surrounding landscape definitely has an effect on the health of its citizens. How can

we modify the design of our cities in such a way that it supports our health? In what way can greenery be applied to improve the urban environment? And how can we better utilize the positive effects of greenery on health and wellbeing in the living and working environment (in cities)?

With regard to behavioral changes, interventions and therapies in the healthy behavior domain have hitherto mainly focused on the individual and less so on an approach at system level. Addressing health at the level of the individual has proved to be successful and still is still paying off when it comes to the prevention of health problems. On the other hand, it's also becoming increasingly clear that there are limitations to this success. It seems that those limitations are caused by interactions between the different layers in the complex system of the (current) health & health care. Strategies to curtail unhealthy behavior are generally very successful, but not always, and not for everyone. For instance, the individual approach appears to be far less effective for people from disadvantaged areas. What factors play a part in the interaction between the various layers in the system and the interaction between the individual and the community? Can a better understanding of the dynamics of such complex system interactions lead to a model that can be used to make those interactions visible, to monitor how the system in all its complexity will develop, and to predict and steer desirable healthy behavior?

Here as well, the emphasis is on researching and designing system behavior. Design researchers and creative professionals will, in close collaboration with other stakeholders, work on larger projects and programs that explicitly focus on high impact. Creative professionals in particular will play a big role in designing, describing, implementing and guiding system interventions that will ultimately make the transition of a system to a desired situation possible.

By placing the emphasis on the positive qualities of health care and less on the prevention and curing of illnesses, other changes will be desired to improve the wellbeing of these people and their direct social environment. When it comes to long term health care, like with dementia, the focus should be more on the resilience and self-reliance of the target group. Look at what is possible, instead of what isn't anymore. This way, the vulnerable and dependent groups stay a bigger and longer part of the inclusive society.

By being heavily involved in the practical development of making health data accessible for people, the creative industry can make a contribution to the applicability and stimulation of the use of applications. Visualizing data, for example, but also the development of application-specific products. How do we get people to make use of e-health solutions? The Create Health program of CLICKNL researches how the use of new technologies in health care and wellbeing can be advanced.

Nutrition – specifically the decision-making behavior of the consumer – influences our wellbeing. For the Netherlands, as the largest exporter of agricultural products in Europe, it's a challenge to not only contribute to a health society, but also to strengthen this sector. In the program High-tech to feed the World, top sector Agri&Food approaches food production and nutrition from a technological perspective. An approach based on behavior and behavioral influencing is complementary in this.

NUTRITION – SPECIFICALLY THE DECISION-MAKING BEHAVIOR OF THE CONSUMER – INFLUENCES OUR WELLBEING





5.3.3 RESILIENCE IN SOCIETY

Until now, innovations have often and mainly been focused at curing the symptoms of problems that are embedded more deeply in our society. For example, from positive psychology we now know a lot about how individuals can arm themselves against stress or setbacks, or can learn how to better cope with them. How can they improve their resilience? In some cases this knowledge is also coupled to the new possibilities of technology: think, for example, of the many apps and web-based systems that support people to stay mentally healthy and of the substantial growth of e-mental health. The big challenges with regards to resilience we currently see in our society, however, seem

to indicate that the positive changes we initiate on an individual level are often undermined. The amount of cases of depressions and burn-outs is still on the rise. Possibly we are not reaching every individual. This means that, for a transition to a more resilient society, we need to look beyond the level of the individual; we will need to think about change on a higher system level.

New technologies and innovations offer opportunities. For example, products and systems through which seniors can live at home longer and more safely have a positive effect on the self-reliance of seniors, developments in prosthetics and exoskeletons help with the reintegration and participation of people with a disability, and the two and a half million (digital) illiterates in the Netherlands can now also better participate in society.

The extent of resilience in a society is influenced by the proportions and relations within that society. Therefore, design for resilience must be studied on a system level. Hence there is a great need for knowledge about how we can map resilience on a system level, specifically how we can determine what the possibilities for change and their impact are. This knowledge can eventually lead to the design of interventions that contribute to a more resilient society.

The creative industry could pursue motivating the use of interventions on an individual level, for instance by utilizing gaming and concepts from positive psychology – such as flourishing; a concept that describes a state of optimal performance and wellbeing. The app Headspace is a good example of this.

As of yet, there has been less attention inside the creative industry for the support of personal development, the positive functioning of people and working preventively. Many developed interventions focus on individuals; how an intervention can support the system (or people functioning as a group within a system) to collectively be more resilient is in need of further research. The first investigation into this form of interventions has been done in the health care domain.

How can systems play into the social contract of society if we create a movement from self-reliance toward compassion, in which citizens are there for each other. How can we learn to design for communities, instead of individuals? Within design research, a noticeable shift is taking place toward thinking on a system level.

HOW CAN WE LEARN TO DESIGN FOR COMMUNITIES INSTEAD OF INDIVIDUALS?

5.3.4 ENERGY AND BEHAVIOUR

Energy and Behavior concerns the behavioral changes that are necessary to attain set climate goals. The reduction of our ecological footprint is not just a matter of lowering our thermostat or taking shorter showers. In an average household, only 18% of the emission of the CO₂-equivalent stems from direct energy use. A large part of the CO₂-equivalent emission is the result of the burning of fossil fuels during the production of food, transport, usage, or elsewhere in the chain. From this one can infer that focusing on behavior change in food or mobility can result in a great contribution to diminishing our footprint.

The role of the citizen in the energy household is shifting from consumer to producer due to the rise of solar panels and through local initiatives in which citizens generate energy. The creative industry earlier was involved in the development of a model for an integral approach for energy transition at the district level; the Green Deal Smart Energy Cities. However, local energy initiatives are no commonplace yet. Barriers for developing these kinds of projects exist in both investing and in technical challenges, and in setting up a successful way for citizens to collaborate. Additionally, in order to make the production of energy more sustainable, supply and demand have to be more closely matched.

It's not always easy to involve citizens in energy projects in a meaningful manner. Citizens' interests are often more present on a meso and micro scale, whereas energy companies look at measurable and quantitative indicators on a macro level. On a macro level, a change in the encouragement of technical innovation can be searched for. The national government has legislations and regulations as tools to stimulate businesses and governments to use less fossil fuels. Involved parties have entrenched interests or norms and rules that make it hard to adjust among themselves. To make interventions possible, we must search for new ways of or contexts for collaborating.

The creative industry contributes to the energy transition both substantively and developmentally. Creative companies make technological innovations accessible for consumer and companies, or play an active role in the development of technology themselves. In addition, through user-experience and service design, creative professionals make a positive contribution to the energy transition. The shift toward a more decentralized energy generation is an opportunity for the creative industry. Currently, this local transition is set aside only for driven communities with the resources and knowledge to invest. These initiatives depend on engaged citizens, companies, and government, that work together in an egalitarian manner. They need to be motivated by more than return on investment and financial incentives on the short term. In order to increasingly make such system changes possible and effective, creative professionals will need to obtain more knowledge about new technologies

such as the Internet of Things (IoT), blockchain, machine learning and artificial intelligence. Being able to point out and work with data and algorithms are core competences in this: in the hands of the creative professional, working with data can get a different meaning. A more creative or empathic perspective could be of added value.



THE CITIZEN'S ROLE IN ENERGY MANAGEMENT IS SHIFTING FROM CONSUMER TO PRODUCER



6

ROADMAP THE HUMAN TOUCH

STRATEGIES FOR UNITING AND CONNECTING, SEDUCING, GIVING INSIGHT AND BUILDING TRUST IN PEOPLE.

6.1 INTRODUCTION

Due to the complexity and the long term perspective of systems, the individual is at risk of disappearing from sight. That's why we must constantly shift back to the human level, and take into consideration the effects that systems, products and services have on the individual.

It's desirable that within the creative industry work is done on a knowledge base that makes creative professionals capable of far-reaching integration of the human dimension in their products and services. Currently, practical knowledge (know-how) is still often used. This type of knowledge often is implicitly connected to a concrete practice. Scientific research can analyze this practical knowledge and contribute to raising this knowledge to a level that is generalizable. In the social sciences and humanities relevant knowledge has already been developed, on which can be further built and together with which new projects can be initiated.

In contact with people four levels can be distinguished, ranging from neutral to invasive: reaching, involving, charming and spurring. Reach concerns contact through the presentation of information. In many cases, this is a one way street. With involve, the interaction with people is central, sometimes through co-creation. Charm is about establishing contact by creating a compelling experience. Spurring is the most invasive on personal privacy, where an attempt is made to make people take action, or specifically stop a certain behavior.

The different levels lead to different questions. How do you capture the attention of a group, for example, amid the overload of information that they are bombarded with? Or which forms of interaction work best for this topic and this specific group? What are the general characteristics of a compelling experience? How can you influence or even convince individuals and groups to do or specifically not do certain things? How do you instill a sense of responsibility in a group for something they made in cocreation with a third party such as the government? Scientific research and

conceptualization offer answers to the above questions, but they are limited because of two reasons. Firstly, because they are generally developed inside a specific discipline with a focus on a specific question, such as knowledge in marketing about commercial target groups. A second limitation arises from the swift changes in society, which give rise to new questions. The large-scale spread of smartphones and social media, for example, challenges science to offer insight into the social consequences of this development.

6.2 RESEARCH DIRECTIONS FOR THE KNOWLEDGE BASE

Digitalization, and in particular the background gathering of data traces of the user, make it possible to increasingly personalize products and services. This is putting more and more emphasis on the individual. Yet, the general principles of reaching, involving, charming and spurring remain relevant. After all, most products and services are not made for the individual, but for groups of users. If only for the fact that that's the only way of making them profitable.

The research within The Human Touch needs to be sensitive to the relationship between personal forms of engagement and general, invariable principles and mechanisms that enable the engagement of large groups. In this paragraph we discuss research directions that give interpretation to this, based on four sub-themes.

6.2.1 DATA-DRIVEN DESIGN

- Which behavioral data are needed for customization of products and services?
- How do users understand and experience systems and what relations do they form with them?
- To what extent can technology and data take control over individual human activity?

Data-driven design is not a commonplace term. The term design is broad and can refer to both the design process, as well as the final product or service. Furthermore, the data-driven aspect can still apply after the document's launch, whereby the product uses data to function: this includes almost all software, Internet of Things applications, but also the blueprint of organizations.

reCAPTCHA is an example of a data-driven design. If you want to get online access to a secured page, for example when making an online payment, reCAPTCHA verifies if you are indeed a person. reCAPTCHA does so by asking you to retype a number of difficult to read words off of pictures. By doing so, you not only get access to the page, but simultaneously help to digitalize handwritten texts.

Users' behaviors and their direct input generate data. This data is used to model and optimize the design of products and services. With the development of the fourth industrial revolution (increasingly networked and intelligent production systems) the creative industry can capitalize on the technology-focused opportunities by offering personalized

USER DATA ARE USED TO MODEL AND OPTIMIZE THE DESIGN OF PRODUCTS AND SERVICES

services. Data-driven design comes at a cost, however. The growth of various smart applications and the Internet of Things come alongside concerns about the implications for privacy. Not every citizen accepts the trade-off between personal data and convenience. Furthermore, it's not clear to designers in what way their products or services - which generate, collect, or generally even use data – will influence the lives of users in the long term. Significant is also that for companies and government, the benefits are far greater than the value they assign to the consequences for privacy, for example. Because of this, choices are made that don't always protect or grant the most autonomy to the individual citizen.

Data-driven design can also steer or guide the design process. Designers need to become well-versed in the use of data, and in the process realize that this data can have a big impact on the concerning person's life. How does data play a role in making decisions? How can it be used to generate alternatives? In what way can it be supportive in stimulating concepts?

Data is sometimes called the new gold. In what way can data be used as a form of currency in the creative industry? In what way does the creative professional create value in this area for the citizen, customer, designer and supplier? And in what way ought this value be distributed?



6.2.2 VALUE OF SYSTEMS

- How do we design products that exclude no-one?
- What possibilities does technology offer for personalization of creative products and services, and what limitations does the technology impose?
- Which methods in research and design make it possible to move away from one size fits all?

In order to design the aspects for the individual in concrete creative products and services, it's essential to gain insight into how users use and experience the product or service, and what kind of relationship they form with it. The mutual dependence between user and product is of importance there. When the individual is central, the product only becomes valuable when it is used. At the same time, the individual in this context is only relevant in the role of user of the creative product or service.

If the need for individualization is met with personalized services and products, the value perception of that solution and the system in which it exists changes. To illustrate: customized clothing will be worn for a longer period of time. At the same time, its customization limits its capacity for re-use. Both elements thus influence the sustainability value of the system of clothing production and sale.

Driving forces for individualized solutions are user data: both for the physical aspects (such as shape, weight, power) and usage data (such as viewing behavior in the media sector and consumer behavior in retail). How do we turn those data into solutions? Which new methods are needed to develop opportunities without losing the efficiency of scale?

6.2.3 THE MECHANISM OF MEANING

- How does the process of appraisal develop in an individual?
- How does the narrative around a product of service offer added value in reaching the citizen?

Aside from data, users also generate experiences. Those are often emotional, or, affective, in nature. Think, for example, of citizens who are excited about the parking app on their smartphone. The affective reaction is not automatic, but rather emerges from a process of appraisal. Research in cognitive psychology shows that people look for meaning in their relationship with the world around them. In other words, they want to understand what is happening and why it's happening that way. This also applies to relationships people form with objects, cultural artefacts and media. Here as well, the process of appraisal has cognitive and affective aspects, for example when a listener understands why enjoying a country ballad feels like a guilty pleasure to him or her. In general, the assigned meaning can be cognitive-rational (understanding something), but often

they are just as much affective (pleasure, a good feeling, relaxation).

In what way do citizens assign meaning to creative products and services? Knowledge about these kinds of questions is a condition for gaining insight into how citizens can be reached, involved and charmed and perhaps even spurred into action. The group can be broad, like with blockbuster movies, or exist of a niche audience. Assigning meaning is researched on a system level because the meaning emerges inside the system, in the relationship between user and product or service. In that way, justice is done to the product features (affordances) that contribute to the appeal of the product and simultaneously to the way in which users assign meaning to those features.

Research into the appeal of products and services builds on previous research into how entertainment media manage to capture and hold the attention of the audience.

Entertainment often concerns forms of charming that contribute to a pleasurable experience for the audience. This gives rise to fundamental questions, such as what determines the appeal of a format? And, how can immersion in the production be maximized? There are indications that the narrative structure of a story offers added value, as opposed to other forms of presenting information. It should go without saying that research into storytelling ought to be put on the agenda, because stories offer the possibility to coherently present complex information and offer room for individual focusing inside an overarching narrative structure.

6.2.4 FREE-RIDERS

- Which data are users willing to give up in exchange for a (free) service?
- In what way can users be involved in making decisions about the data that is to be exchanged?
- In what way can creative professionals reach the non-active users to offer them a meaningful or pleasurable experience?

Products and services only become meaningful once users relate to them. They do so in various ways: not all users are (always) active. What do people want to be able to decide for themselves, and in which moments do they prefer being taken by the hand? What value do people expect from products and services, and how much are they willing to spend on them? For which types of services are consumers willing to pay? And which kinds of services do they expect to be freely available? Free usually means that a platform allows advertisements or collects and sells data at the back-end. The user then does pay, but not with financial means. This possibility gives a powerful impulse to the development of other, innovative earning models. What kinds of new development and business models can be developed for this? Does such a development offer opportunities to involve users, can they pay for a service in another way? And privacy-sensitive data, how do you handle those? What methods are there to anonymize large amounts of data?

Additionally, users expect more and more services to be available for free. What does this mean for the possibilities for developing new services? How can the creative professional cater to these expectations?

**IN THE HUMAN
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6.3 SOCIETAL CHALLENGES AND THE ROLE OF THE CREATIVE INDUSTRY

In The Human Touch, people are central. Usually as individuals, but sometimes also as a (often small and sometimes local) collective. The individual has various roles. For instance, the individual can be engaged as a consumer one wants to reach or charm, or as a patient that is spurred into changing his lifestyle. With societal interventions, the individual is often a citizen that is to be involved in an issue. In the roadmap THT we use the term citizen as a broad denominator to refer to the various societal roles an individual can play, for instance as resident or as employee, but also as father or mother, or as a homeless person. In this paragraph the societal challenges that are substantively tied to the roadmap THT are further elaborated.

6.3.1 QUALITY OF LIFE & WELL-BEING

We are increasingly aware that our unbridled consumption in the long term doesn't automatically lead to more well-being. Our way of life is under physical and psychological pressure due to the demands of our work and environment. How can we develop products and services that actually, in the long term, contribute to happiness and quality of life? The individual, human, aspect is of great importance when it comes to questions about quality of life, because an individual's or local group's experience may differ from the general pattern.

Creative professionals can make the difference by anticipating in their design the various ways in which citizens can define their quality of life. A good example of this is private space being publicly accessible, a phenomenon that is becoming more common in new housing clusters in large cities. How can justice be done to the interests of varying users? Which interest is more important? In what way can the interests be balanced?

Previous research has shown that the urban resident has a relatively unhealthy lifestyle. What role does the organization of the city play in raising the quality of life of society in its entirety? More research is needed to clarify which parameters influence the physical and mental health and the wellbeing of the urbanite, and what differences there are between groups in the city. In what way can the organization of the public space spur urbanites into exercising?



Cities strive to offer their citizens a high quality of life, in which social inclusivity and a sustainable lifestyle are stimulated. These values are promises of the “smart city” or “smart society.” Technological developments are viewed as strong enablers for this transition: not as an end in itself, but as a means to improve the livability and offer residents a pleasant and sustainable habitat. These challenges for the cities of the future are broad and multidisciplinary in nature, and demand a collective approach from government, knowledge institutes, industry and citizens. Smart society applications build on knowledge from data science, urban development, architecture, social sciences and the humanities. The development of organization structures, process models, data models, communication models, spatial models, business models, etc. to make integration and interaction between these traditionally separated disciplines possible is fundamentally new, but essential. As of yet, smart society applications largely manifest in companies, and scientific knowledge can be found more in the social sciences and less in the field of the creative industry.

More and more often, concepts are developed in which people are spurred into positive behavioral change through a game element. The serious game From 5 to 4 aims to motivate commuters to leave the car once a week and instead take the bicycle or public transportation to work. This case inspires research into the way in which the target group can be reached and engaged, and what motivates people to play this type of game. Research into the cause for games such as From 5 to 4 can also offer insight into ways of spurring individuals. What effects does gaming have on their environmental behavior? Finally, research in response to these kinds of serious games can stimulate the development of similar creative interventions.

Creative products can also contribute to raising the quality of life in a completely different way. This is happening for example in the field of entertainment-education, where soaps and other entertainment media are used to convey (health) information. Research shows that such narrative media formats know how to reach an audience that has little interest in the more traditional forms of information dissemination. The challenge for the future is to research which media formats can retain the charm element of entertainment productions in the fast-changing landscape of media supply and media consumption.

What can big data do for the quality of life? How can this impact be measured and in what way can knowledge about this be developed? How do we utilize systems to contribute to quality of life? What influence does this have on our habitat?

New research areas such as positive computing and positive architecture have a role to play in increasing the overall wellbeing of society. How can we enhance the relationships between citizens and strengthen their autonomy through interventions?

6.3.2 TRUST & SECURITY

The digital world brings with it questions about trust and security. How do we ensure that people keep faith in smart systems and how do we guarantee an acceptable level of security and privacy in a digital world?

Research into this may focus on the familiar platforms from the United States and on the opportunities that European legislation offers citizens, for example with regard to privacy. For creative professionals the challenge is to explore possibilities and develop alternative platforms that are independent from the servers in Silicon Valley. An example of this is the online platform Gebiedonline. This shows that the cooperative organization form offers a fundamentally different view on trust and security. Gebiedonline also shows how much online and offline communication are interwoven. The mission of the platform is to create as many local networks as possible and together create value with the help of their own online platform. What Gebiedonline does can, to a certain extent, also be done through Facebook, but their security and privacy conditions are dubious. Gebiedonline wants to solve this with cooperative property. Gebiedonline offers people

the possibility to become active in their own neighborhood while still being able to make clear agreements about privacy and security. That way the quality of life and resilience in the neighborhoods rises. How users experience the relationship between online and offline, and if the borders between these entities are blurring for them, ought to be researched thoroughly inside the THT roadmap.

What can the creative industry do for physical and digital security and its perception? How can the creative industry increase the sense of security, and what consequences does the declining transparency of the security systems have for the overall feeling of security and trust in institutions and the people in society?

6.3.3 PERSONAL EXPERIENCE

Society looks for balance between collectivity and individuality. Uniqueness is a great good and part of the achievements of the modern society, but has a downside that can negatively impact solidarity. It's becoming increasingly easy to develop custom-made products and services, but what will be their impact on sustainability? How can we create value for the end user through far-reaching digitalization and personalization in production, content creation and design? How do we create products and services that meet the need for a personalized offer?

WHAT CAN THE CREATIVE INDUSTRY DO FOR PHYSICAL AND DIGITAL SECURITY AND ITS PERCEPTION?

Smart products and services aim to make the lives of users easier by registering their usage behavior, to make later use go more smoothly. Additionally, digital technology helps with the envisioning and creation of imaginary worlds. Virtual Reality (VR) is an invasive technology when it comes to personal experience. The yield is potentially very high, because VR is capable of immersing the user in a completely fabricated reality. This can be applied in various domains. For instance, it's possible to give users the feeling of wandering through a medieval town, but it can also offer a therapeutic environment that teaches patients to cope with their phobia. VR is also utilized to design and visualize new situations, for example by fitting and presenting fashion designs. This curtails the waste of clothes that don't fit. Now that prices of commercial VR sets are falling and a larger audience can be reached because of it, it's necessary to not only focus research on the impact of VR interventions, but also on what users expect from VR. That knowledge allows the creative professionals to cater to the wishes of their audience. The low-scale and experimental use of VR offers opportunities to try out new applications in media or learning environments.

THE SMALL-SCALE AND EXPERIMENTAL USE OF VR OFFERS OPPORTUNITIES TO TRY OUT NEW APPLICATIONS IN MEDIA OR LEARNING ENVIRONMENTS



6.3.4 HUMAN EMPOWERMENT

Due to complex developments many citizens have gotten the feeling that they hardly have any control over their own living conditions. How can we empower people to be able to take care of themselves again? What does the past teach us about this and how can that contribute to new insights?

Human Empowerment looks at how people can regain control over their own situation and in what way creative products and services can contribute to that. Mama's Garden, the meeting place for mothers and children in Rotterdam Zuid, for example, shows how the collaboration between citizens and creatives can contribute to empowerment: "For (expecting) mothers, there was no pleasant or cozy place to meet and share experiences in Rotterdam Zuid. Based on research done by creatives into the mothers' needs, Mother's Garden was developed. It exists of a table with a bench, a play tower, a mama tower and a little bar, so that it's an appealing place to stay for both the mothers and their children. Mama's garden is currently organized in four different locations and takes place once every week."

Variety in the way in which people are involved, means that research into the contribution of creative products and services to empowerment must come alongside research into how citizens themselves experience their empowerment.

Hackathons, where groups of citizens develop solutions to a problem themselves, are being applied to more and more topics. Businesses make use of such popular developments to work on new products and services together with their target audience.

Open source technology and the availability of open data means that people are themselves able to develop technology that aligns with their needs. With open data citizens can grant themselves insight into the details of their environment. This allows them to pursue issues relevant to them, and to substantiate their choices with publicly available information. These promises are somewhat mitigated by questions about the public availability of personal details with regard to privacy and anonymizing. No good solutions have been developed for this yet.



ROADMAP VALUE CREATION

STRATEGIES FOR REALIZING SOLUTIONS AND NEW PROPOSITIONS; KNOWLEDGE ABOUT INNOVATION POWER AND DESIGNING SKILLS.

7.1 INTRODUCTION

The roadmap Value Creation focuses on the knowledge development about the innovation capacity and the method of value creation in the sector. This in contrast to the other roadmaps, which mainly map how the creative industry can be of value in tackling societal challenges. This roadmap discusses meta questions about ways of organizing work, new business models and changing roles, and their subsequent implications for the competence development of creative professionals.

The changes in society caused by technological and demographic developments and the increasing flexibilization of and insecurity about working conditions have implications for the creative industry. The sector is characterized by a polarized concentration of jobs at very small companies on the one hand, against a number of large ones on the other. More freelancers have entered the creative industry due to the financial crisis. They often struggle to make ends meet. There is less government

support, and still too few alternative structures have been developed to be able to generate other sources of income through entrepreneurial endeavors. Beginning creative professionals therefore face the challenge of having to take more risks while having less sight on the possible outcomes.

If we were to only build on the traditional role of the creative professional, a lot of opportunities would be missed out on. In the long run this could threaten the survival of the sector; the sector would stagnate and fail to innovate itself. It still is unclear, however, where and how the creative professionals can best realize their added value. It's also unclear what knowledge and competences from the areas of application and which economic principles of value creation and appropriation the creative professionals will need in the future.

7.2 RESEARCH DIRECTIONS FOR THE KNOWLEDGE BASE

In order to be able to determine how the creative industry realizes its potential – regionally, nationally and internationally – it's important to gain insight into the ways in which the creative professional works and how her work is influenced by the environment she works in. This includes the physical/material and technological environment, the (in)formal, (inter)personal, organizational and geographical environment, the infrastructure (the formal and informal networks in which she operates and the facilities she has at her disposal) and the legal frameworks.

In the current creative industry partnerships are of the utmost importance: companies, branch organizations, regional innovation networks and the local, regional and national government are essential parties for ensuring that the developed knowledge also translates to the economic practice. The collaboration between creative professionals and parties outside the creative industry, including knowledge institutes, is crucial for the optimal utilization of the potential of the creative industry in society. This collaboration is in need of further research and development, especially with regard to the new ways of working in the creative industry and elsewhere. In interaction with other sectors and domains, it's important to know what the ratio is between permanent focus on innovation in products and the services, and the competence to innovate the system of labor and making a living. In large part this includes the development of sustainable business models, new roles, and knowledge

and skill, but also has an effect on the way in which the work of creative businesses and/or the independent professional is organized.

Colleges and universities are partners in the larger network of creative professionals. How does the knowledge developed in formalized R&D programs relate to the professional and often operational knowledge and insights on the work floor? The emphasis on migration of talent inside the creative industry and between the creative sector and other domains is in economics seen as a catalyst for innovation. More insight into these kinds of processes and the branching of (business) sectors is needed to know if innovation inside the creative industry profits from it.

7.2.1 NEW DESIGN CAPABILITIES

7.2.1.1 ORGANIZATION STRUCTURES

- What kinds of network organizations and alliances of self-employed workers inside the creative industry does the creative professional need to do his/her job optimally?
- Which strategies can designers use to establish thorough, intensive, interaction between science and society?
- What knowledge and skills with regard to the design of systems and transitions are necessary to be able to successfully design transitions?

The creative industry mainly exists of medium-sized companies and self-employed professionals, whether it



IN ORDER TO OPTIMALLY SHAPE CO-CREATION AND INNOVATION NETWORKS, KNOWLEDGE IS NEEDED.

concerns work of architects, media makers, designers, or artists. They combine different roles and work agile and project-based. That is why companies are organized differently, and why there are differences between companies in the creative industry and elsewhere. The organizational embedding of self-employed workers, for example, impacts the way in which the creative industry functions. The effects of this are yet to be further mapped, in particular the effects of research that maps the interaction between the macro and meso level on the individual level. How do institutional, social and legal frameworks influence the daily work of employees and independents and the business-economic, organizational and strategic actions of employers and entrepreneurs in the creative industry?

The creative industry is increasingly characterized by co-creation, with partners from other sectors, but also with

civilians. Innovation is often inspired by interaction with and inspiration from other sectors, but these collaborations are not necessarily easy. Partners have different motives, don't speak each other's language, or can have other background knowledge. To optimally shape co-creation and innovation networks in which expertise and skills are exchanged, knowledge is needed about how civilians can become equal partners in the co-creation process, so that the creative professional can utilize his/her specialized knowledge and skills.

Not only the organization structures, but also the work's form changes due to the entrance of methods from the digital world. Little is known about the effect of the continuous changes in context, process and output, the permanent beta. It is desirable to do even more extensive research into the new development and innovation processes in this new landscape. Can design methods

be developed that can handle the “new age” projects without clear beginning and end? Which strategies or methods does the creative professional use to deal with the many (shifting) factors in projects?

To what extent can the characteristic way of organization and collaboration forms in the creative industry contribute to innovating developments in other industries? In doing so, can the creative industry function as a testing ground for other sectors?

7.2.1.2 THE ROLE OF THE CREATIVE PROFESSIONAL

- How can we make creative professionals aware of the power of their “fresh perspective,” and how do we ensure that they retain this fresh perspective throughout their career? How can you develop the “fresh perspective” as a method/technique and apply it professionally?
- How can creative professionals contribute to orchestrating interdisciplinary collaboration, initiating creativity in service of societal issues?
- The creative industry has a high diversity of professions and work fields. How can the mutual exchange and enrichment be improved?
- How do you stimulate the development of knowledge and competences specifically outside the universities and inside companies?



The changes in the future collaboration forms and in the possible business models have implications for the possible and desirable roles the creative professionals can play. Research in this area aims to map what roles might emerge and how these relate to the own professional identity.

The role of the creative professional in innovation projects is changing. In strategic matters, the creative professional is increasingly being involved earlier in the process. In addition, she is assigned the role of facilitator of the entire innovation process and of connector between all stakeholders to collectively generate solutions. To be able to take on these roles, different and new knowledge and skills, and a different mindset are asked of the creative professional. This also gives rise to the question if the creative professional should be able to play all these roles, or if she should commit to one specific role?

With the increasingly broadening role of the creative professional, the scale and content of the work also changes. The creative professional ought to be equipped with new knowledge, methods and skills to be able to initiate and facilitate innovation processes and design at a system level. Simultaneously, she has to always take into account the human dimension, and be able to imagine and generate support for solutions on this new order of magnitude for a multitude of stakeholders. Additionally, the “end product” of a project is no longer static, but dynamic, which means that projects often no longer have a clear starting and end point. For instance, how do you design all the layers of a modern design question (product > service > social > economy) simultaneously? Designers will have to embrace the complexity and, in all its richness, fit it into the process.

ROLE STRUCTURE AND IDENTITY

With regard to roles in collaboration, one can look at research from the social sciences into role structures in teams and the sociology of professions. In sectors with a strong project-based method of working, such as in the film industry, role structures serve to be able to quickly shift based on implicit expectation patterns of what everyone ought to be doing. The same structures that enable quick shifting on familiar terrain, can also obstruct a change of roles. Characteristic of a profession is having a jurisdiction, the final say, about a somewhat delineated topic. When professionals face new challenges, conflicts often arise about jurisdiction on the border with other professions: if architects start to be

more entrepreneurial and start to initiate projects based on their vision of urban development, but without a concrete client, do they therefore become developers? If they manage to position their vision well in the political game of project development, are they then less architects? An industrial developer that focuses on product service systems in health care often has to have nearly the same amount of medical knowledge as the involved doctors, but is also expected to have a fresh perspective on the patient as user. How can creative professionals dive into an application area without drowning in it? Research in this domain ought to make use of theories and findings from the social sciences, but these need to be applied empirically on the specific characteristics of the different blood groups inside the creative sector. These shifts also affect the identity of creative professionals. “Am I still a recognized member of the profession if I utilize my design skills as a consultant?” To what extent do creative professionals want to blend in and serve the norms and values of the economic world? How can they make a contribution while maintaining their creative independence?

EDUCATIONS AND HUMAN CAPITAL – LEARNING CREATIVE PROFESSIONALS AND ORGANIZATIONS

Some educations are aimed at designers as service providers and connectors that know enough of other disciplines to be able to support and orchestrate a collaboration; others focus more on personal, artistic, development. Both dimensions are important to the survival of the profession – how can both contribute to competence development throughout the career?



Appropriate and up to date education is essential for a strong sector, so that creative professionals have a solid foundation for making the connection once they start in practice. This roadmap offers room for the importance of continued investment in knowledge development and dissemination in the sector, to ensure that the creative professional remains up to date with her knowledge and competence.

7.2.1.3 WHAT DEGREE OF INSIGHT INTO THE (IM)POSSIBILITIES OF TECHNOLOGY IS VITAL FOR THE CREATIVE PROFESSIONAL?

- What knowledge of new technologies must creative professionals gain during their education in order to capably work together with technical experts? And how do they maintain this knowledge?
- What skills do designers need to be able to capably work together with technicians?

Technology is becoming increasingly important in the work field of the creative professional. However, it is impossible for the creative professional to master all the associated skills. There are two approaches to working with technology on a high level: the creative professional that works from her knowledge and competence as designer and applies technology to develop her projects, and the designer that departs from the possibilities that the new technology offers, and who sees that as the starting point for a creative process.

THE CREATIVE INDUSTRY CAN DEVELOP NEW BUSINESS MODELS FOR THE WAY IN WHICH IT ADDS VALUE ITSELF

When the creative professional has affinity with technology, but hasn't developed technical expertise, it is imperative that he has a general understanding of the many different technologies, and that he knows where he can find knowledge when necessary. He will have to have a solid network to let himself be advised on what the most appropriate technology is, and subsequently delve into this technology. In that way, his knowledge will develop further and enable him to work together with technical experts, ask the right questions and, on some points, even challenge the technical expert in the application domain. The creative professional always keeps the intended effect of his design in his sights. He ensures that he understands enough of the technology to be able to assess what the (side) effects of the technology or his design might be.

Technology offers new possibilities and can be the starting point for a creative process. The creative professional has immersed himself in the various technologies and through many experiments has built up in-depth knowledge about the (im)possibilities of the application of these technologies. In his design he pushes boundaries: because his knowledge level is of such high level, he designs new technological projects, turning technology into a resource.

7.2.2 BUSINESS MODELS

- What makes new “trading” business models (where goods, services, knowledge or effort, instead of money, change owner) successful and how can the creative industry design for it?
- In what new ways can the creative professional protect and capitalize on value (new forms of copyright as creative commons, for example)?
- How do you design for co-creation of value?
- How can the creative industry help organizations to make the transition from thinking in transaction / product / ownership to thinking in co-creation / service / access?

A business model is the way in which two or more stakeholders work together in a businesslike manner to create value with or for each other. Business models are essential to value creation because they form the link between the value creation and the course of trade. In doing so, the possibility arises to sustainably embed value

creation in social and economic structures and have them go beyond the individual interest of the creative professional. However, this does not mean that business models are purely financial or economic in nature. The specific versatility of the business models and the degree to which they reflect socio-economic developments makes them interesting.

In the creative industry, value creation in business models is interesting in two ways:

Voor de creatieve industrie geldt dat waardecreatie in businessmodellen op twee manieren interessant is:

1. The creative industry can act as a facilitator, creator, researcher or initiator in the development of new business models (for 'customers' on the demand side).
2. The creative industry can develop new business models for the way in which it adds value itself (on the supply side).

An analysis of development in the area of business models has shown that these two aspects (business models on the demand and supply side) converge in the direction of creative entrepreneurship.

OUTCOME-BASED VALUE CREATION

Business models are focused on increasing value through value chains or through value networks, in order to ultimately enable individuals and organizations to realize certain goals. There are three types of outcomes:

- Functional outcomes: the business model is focused on solving problems on a functional level.
- Emotional outcomes: the business model is focused on the creation of an experience or an emotional benefit.
- Social outcomes: the business model is focused on establishing social cohesion, a feeling of belonging, or another social benefit.

In general, business models shift from functional to emotional to social. In the long term, emotional and social business models are more valuable for the stakeholders that contribute to and profit from the business model, and are harder to copy. The creative industry can play a valuable role in this shift, if it shows a clear understanding of emotional social value (in a socio-economic context), and, based on this understanding, can use creativity for sustainable innovative business models.

NEW TYPES OF VALUE AND CURRENCY

Certain stakeholders in the network create value in business models by leveraging their resources and capabilities to create something that is valuable for other stakeholders. In traditional business models money is traded for goods: you give an organization money, for which you get a loaf of bread or a washing machine in return. In the service economy, money is traded for capabilities: you give an organization money and in return it organizes you vacation, or your child care. At the same time, a shift is occurring toward non-financial business models, in which money is replaced with other currencies such as



loyalty, data, insight, belonging, etc. Sometimes capabilities are traded for other capabilities: banks provide you extra service if they are granted insight into your data. Or you may stay in a holiday home in exchange for tending the garden. Or you get extra service if you return frequently to my store. The benefiting party thus not only directly earns money, but derives other value from the business model. The creative industry can play a valuable role in this shift, if it understands the economic and social value of these resources and capabilities, and recognizes how the input of this individual value can lead to larger co-creation of value. Additionally, detailing these business models demands a lot of creativity and challenging existing conventions. Finally, the creative industry can contribute to the design of the operational processes in these new business models and the creative caretaking of legal implications.

NEW TYPES OF BUSINESS MODELS

New types of business models are on the rise, and they make up an increasingly large part of the course of trade:

- **Networked:** business models are becoming less linear (value chains), and more networked: multiple stakeholders together create value for each other. There no longer is a clear input and output. Value circulates in the system and has several entrances and exits. Take Schiphol, for example: travelers, airline companies, retailers, customs, hotel and catering, luggage handling, etc.
- **Indirect:** with indirect business models there is no direct link between the value creating and the value consuming party. Although this may appear to be “charity,” the value creating party often is motivated by things like reputation, social cohesion or livability.
- **P2P:** in peer to peer business models value doesn’t flow from company to private person, but between private persons. A company can be a facilitator in this. Take, for example, Peerby, Blablacar, Marktplaats, or crowdfunding solar panels for a local school.
- **Access vs. ownership:** instead of the purchase of a product, access to an outcome is offered here: rent or lease models or time sharing belong to this category. Examples are Car2go, Greenwheels and Blendle.
- **New business models** are an excellent place for the creative industry to add value, because they often involve “soft,” complex, networked, dynamic systems.

EVIDENCE BASED DESIGN MEANS THE CREATIVE INDUSTRY WILL BE JUDGED MORE ON ITS ACCOMPLISHMENTS

To be able to innovate value creation in the sector, insight is needed into the knowledge, competence, and mindset used by the creative professional to realize value. Additionally, it's important for the creative sector to know how to point out and make transparent (and, in doing so, validate) its value.

7.2.3 EVIDENCE BASED IMPACT

- How do you visualize impact; which methods allow for a designed system/transition to be experienced/prototyped?
- How can the creative industry document and measure successes from the past (casuistry) in such a way that it can offer evidence based input for future processes?
- How do you bridge the gap between “soft” and “hard,” feelings and facts, intuition and evidence, exploration and impact – in communication and in processes, methods and tools?
- How can evidence based design offer opportunities to show that your design proposal will actually reach its goal?
- Which knowledge and tools must the creative professional have to be able to predict/design the ethical and societal acceptance of innovations?

Evidence Based Design is a design and innovation approach that has mainly stuck in the built environment and in health care. The basic thought behind it is to use empirical data and thorough validation to create clearly measurable added value through design. It's interesting to extrapolate this philosophy to other application domains, because it can increase the credibility, impact and scope of the creative industry even further. Especially with interventions by creative professionals in complex societal issues, evidence based design can play a big part: it can increase the creative professional's mandate, it can increase support for interventions, and it can eventually increase the impact of those interventions.

Evidence Based Design is particularly interesting, because it can bend the perception of creative products from “nice to have” to “need to have” and it can shift the value from subjective/abstract value to objective/concrete value. But therein also hides a paradox: it is precisely the creative industry that knows like no other how to create subjective and therefore people-oriented, emotional and social value. If Evidence Based Design obscures this value or makes it disappear from sight, it fails to achieve its objective. The challenge therefore remains to combine the human, emotional amenity value of creativity with concrete and measurable evidence to actually achieve sustainable impact.

Evidence Based Design means the creative industry will be judged more on its accomplishments. As such, the relation

between client and creative professional shifts from a due effort obligation to a due result obligation. In addition, the creative industry will become more knowledge-intensive, with more fact-based, validated research and clear casuistry. Finally, the creative industry will have to develop a clear plea for how it will bridge the gap between “soft” and “hard,” feelings and facts, intuition and evidence, exploration and impact.

7.2.4 ART AND INNOVATION

- What role can art play in the gathering of knowledge (other than the traditional scientific approach) in complex development processes?
- What role does creativity play in the value of the creative industry and the creative professional?

The subject Art and Innovation fosters creativity and innovation in a high-tech society. As the antennas of society, the arts offer the possibility to handle the dynamic challenges of the high-tech society more accurately and creatively. The objective is to build the link between the arts, the sciences and society, and to contribute to the creative, technological and sustainable innovation of society.

The methodological importance of material practices and products in scientific research is increasingly being acknowledged. Here, insights from scientific theory, the cognitive sciences, and the cultural and social sciences cross paths with insights from practice-oriented research.

In the NWA document, three topics are mentioned for which the arts can be of value by broadening the experience and knowledge base of the creative industry.

1. Art and creativity can function as an engine for innovation and reflection. In a continuously innovating knowledge society, the creative industry can offer new perspectives on applications. The artistic experiment can serve as a model for making creation processes in other domains. Art makes the invisible dimensions of technology visible and discussable and offers opportunities for reflection.
2. Art can serve as an alternative form of knowledge production. A form that is less focused on verifiable facts, like in the empirical sciences, and more on making other forms of knowing and understanding experienceable through objects. The roadmap therefore also works toward alternative forms of research methodologies that are suited to further inspire the crosspollination of artistic research and scientific methods into more reflection and innovating practices.

Art and creativity can be a source of inspiration for education and life-long development. Research ought to seek out ways to develop the experimental practice of creation and co-creation for learning processes inside the sector.

COLOPHON

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APPENDIX

APPENDIX 1

LIST OF ABBREVIATIONS

BNA	Branchevereniging Nederlandse Architectenbureaus (<i>Royal Institute of Dutch Architects</i>)	OCW	Ministerie van Onderwijs, Cultuur en Wetenschap (<i>Ministry of Education, Culture and Science</i>)
BNI	Beroepsvereniging van Nederlandse Interieurarchitecten (<i>Dutch Association of Interior Architects</i>)	PPS	Publiek Private Samenwerking (<i>Public Private Partnership</i>)
BNO	Beroepsorganisatie Nederlandse Ontwerpers (<i>Association of Dutch Designers</i>)	PSS	Product Service Systemen (<i>Product Service Systems</i>)
CIRCO	Creating Business through Circular Design	R&D	Research & Development
CoE	Centre of Expertise	RvC	Raad voor Cultuur (<i>Council for Culture</i>)
CRISP	Creative Industries Scientific Programme	RVO	Rijksdienst voor Ondernemend Nederland
DDA	Dutch Digital Agencies	SAX	Spectacular ArenA eXperiences
DfC	Design for Change	SER	Sociaal Economische Raad (<i>Social Economic Council</i>)
DGA	Dutch Games Association	SIA	Nationaal Regieorgaan Praktijkgericht Onderzoek SIA (<i>National Co-ordinating Body Practice-Oriented Research SIA</i>)
Dupho	Dutch Photographers	THT	The Human Touch
ECN	Energieonderzoek Centrum Nederland (<i>Energy Research Center of the Netherlands</i>)	TKI	Topconsortium voor Kennis en Innovatie (<i>Top Consortium for Knowledge and Innovation</i>)
EZ	Ministerie van Economische Zaken (<i>Ministry of Economic Affairs</i>)	TNO	Toegepast-Natuurwetenschappelijk Onderzoek (<i>Applied Physics Research</i>)
Federatie	Federatie Dutch Creative Industries	T02	Toegepast Onderzoek (Organisatie voor) (<i>Organization for Applied Research</i>)
KEM	Key Enabling Methodologies	UPPS	Ultra Personalized Products and Services
KET	Key Enabling Technologies	VC	Value Creation
KIA	Kennis- en Innovatieagenda (<i>Knowledge and Innovation Agenda</i>)	VEA	Vereniging van Communicatie Adviesbureaus (<i>Association for Communication Consultancy Bureaus</i>)
KIC	Kennis- en Innovatiecontract (<i>Knowledge and Innovation Contract</i>)	VN	Verenigde Naties (<i>United Nations</i>)
MARIN	Maritiem Research Instituut Nederland (<i>Maritime Research Institute Netherlands</i>)	VWS	Ministerie van Volksgezondheid Welzijn en Sport (<i>Ministry of Health, Welfare and Sports</i>)
NLR	Nederlands Lucht- en Ruimtevaartcentrum (<i>Netherlands Aerospace Center</i>)	WUR/DLO	Wageningen University & Research / Dienst Landbouwkundig Onderzoek (<i>Wageningen University & Research / Agricultural Research Service</i>)
NWA	Nationale Wetenschapsagenda (<i>National Science Agenda</i>)		
NWO	Nederlands Organisatie voor Wetenschappelijk Onderzoek (<i>Dutch Organization for Scientific Research</i>)		

APPENDIX 2

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