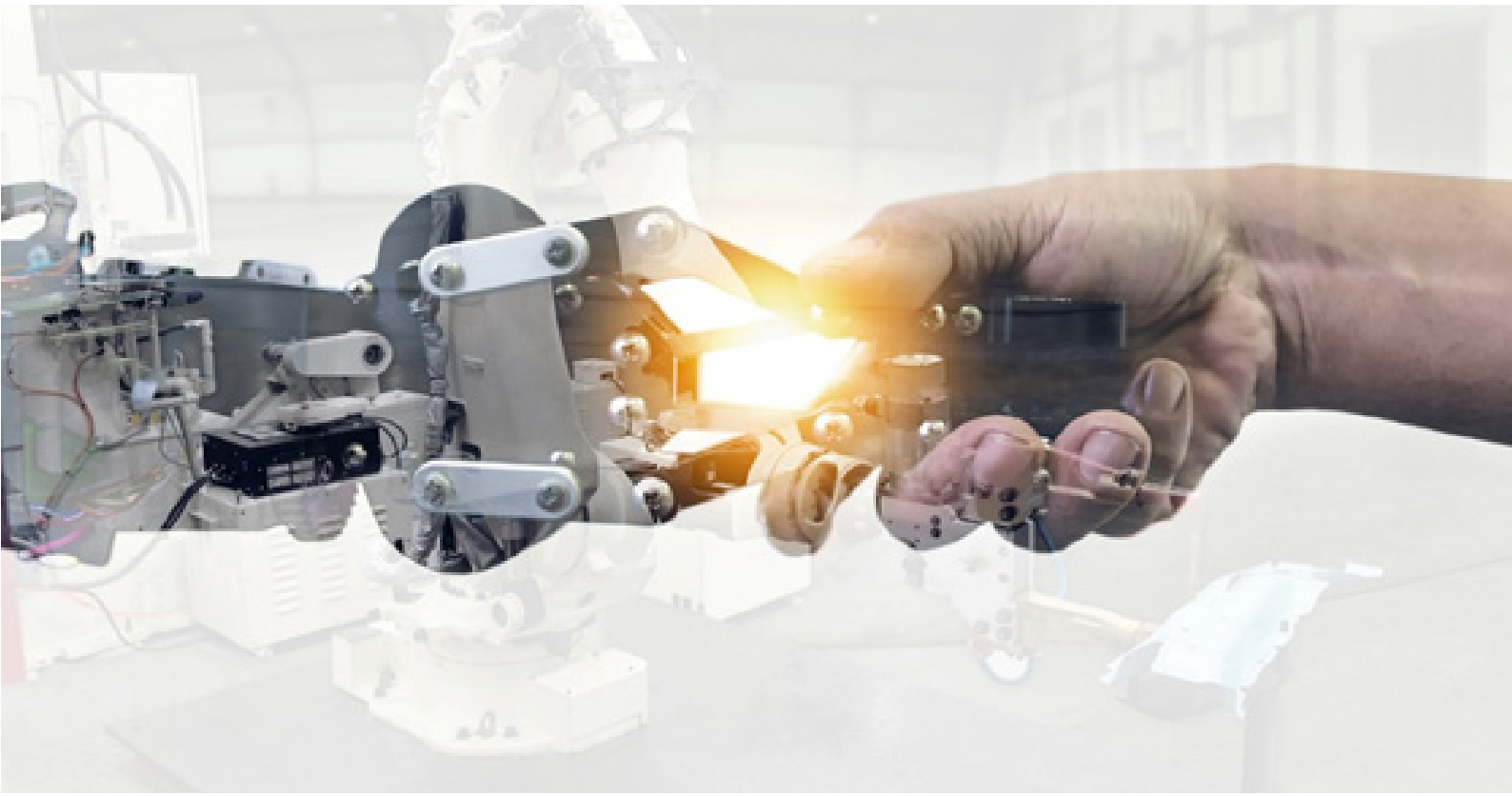
Better use of technology and development of products

Work Package 4

Best practice report - January 2019



Content

Introduction

The Interreg North Sea Region (NSR) project "Growing into Industry 4.0 – Accelerate growth in manufacturing SME's" - GrowIn 4.0 - aims to build strong competences and tools in the participating regions for the benefit of manufacturing small and medium-sized enterprises (SME's). The overall objective is to raise the level of innovation and to create more growth within manufacturing SME's who are heading for Industry 4.0.

The project is working within the following three work packages:

- New business models and strategy development
- Better use of technology and development of products
- Training, education and recruitment of Industry 4.0 qualified staff

In each of these work packages all partner regions have gathered best practices (methods, tools and concepts) with focus on Industry 4.0 and described these in a common template. The intention is to make smart combinations of existing best practices in order to create new tools and methods, which will be tested in partner regions. The main target is to develop Industry 4.0 tools to assist manufacturing SMEs on their way towards digitization.

In total 27 best practices have been described. This report content an introduction to WP4 and the collection of tools gathered and described in this work package. Two other best practices reports have been made for work package 3 and 5.

Selection criteria for Good Practices

In the selection process in the project we have used the following criterias:

a) What makes a Good Tool interesting?

A Good Tool should be:

Simple –user-friendly, easy to understand, with potential to be implemented without large scale changes;

General – theme wide enough that different realities can find aspects of interest; not too specific but easily adaptable.

Applicable – to put into practise for training SME

b) Selection Criteria to identify suitable Good Tools:

The Good Tool examples selected and proposed by a partner should respect the following criteria:

1. Availability of results (meaning: initiatives already completed / at an advanced stage, which show concrete results – both qualitative and quantitative – on the level of skills and knowledge needed for implementation of I4.0 in SMEs)
2. Transferability (meaning: tools with potential to be replicated in another geographical area, available in English)
3. Level of Innovation (meaning: new in the context of industrial skills)
4. Long-term durability (meaning: financial sustainability – i. e. aAffordable, payback/ cost reduction; stakeholder/user participation, etc.).

Introduction to WP4

In GrowIn 4.0 the focus of WP4 is to transfer know-how about suitable technologies and methods of their implementation. The advantages / opportunities of technologies used for digitization have been emphasized sufficiently before. In WP4 we want to motivate manufacturing SMEs to start (or make progress) with digitization by showing them that the process is not as difficult and/or expensive any more as it once could be. Thus, besides helpful tools, we also need to develop models that work out the design of attractive Industry 4.0 solutions and their implementation in any given SME. During digitization, SMEs will experience changes in multiple fields: economics, human resources and technology.

We collected several best practices / tools...

- to make manufacturing SMEs aware of their technology level,
- to demonstrate options that motivate the re sponsible persons,
- to transfer knowledge – which could be done with the help of project management tools,
- to start a follow-up project (best case scenario).

The tools originate from several regions. First WP4 partners collected all the necessary material and described the tools in a template that was designed by the consortium. We presented these tools at an additional meeting in Cambridge (July 2nd – 3rd 2018) and at a partner meeting in Groningen (November 6th – 7th 2018). The tools were discussed and this resulted in a selection of tools. The relevant tools are put in templates. In this report, all tools collected by WP are listed, followed by the list of finally selected tools.

Best practices / tools found by WP4 partners

BEST PRACTICE	Type	Applied in...
Cybersecurity scan	I4.0 security assessment	pre-phase
VIA ICT bachelor project method	project management	pre-phase
Made Different	I4.0 assessment tool	pre-phase
Camtasia	UI assessment tool	planning phase / implementation phase
Unity 3D	AR / VR assistance tool	planning phase / implementation phase
Facilitation in CDR	project management	(permanent)
Innovation Camps	project management	planning phase / implementation phase
~~connected-production.de~~	~~I4.0 assessment tool~~	~~pre-phase~~
IMPULS Industry 4.0 Readiness Online Self-Check	I4.0 assessment tool	pre-phase

Update November 2018:
The connected-production.de tool has been REPLACED with the "IMPULS Industry 4.0 Readiness Online Self-Check" by WP4 leader, in which SMEs will be ranked in a similar way compared to the old tool, but it has been developed by the German Mechanical Engineering Industry Association (VDMA) and is based on / validated by a solid study, which can be found in MidtRum and here. Also, the tool has already been translated to English language by IMPULS (VDMA).

Selection Criteria for Tools in WP4 (for test in SMEs)

Every tool should meet the following conditions:

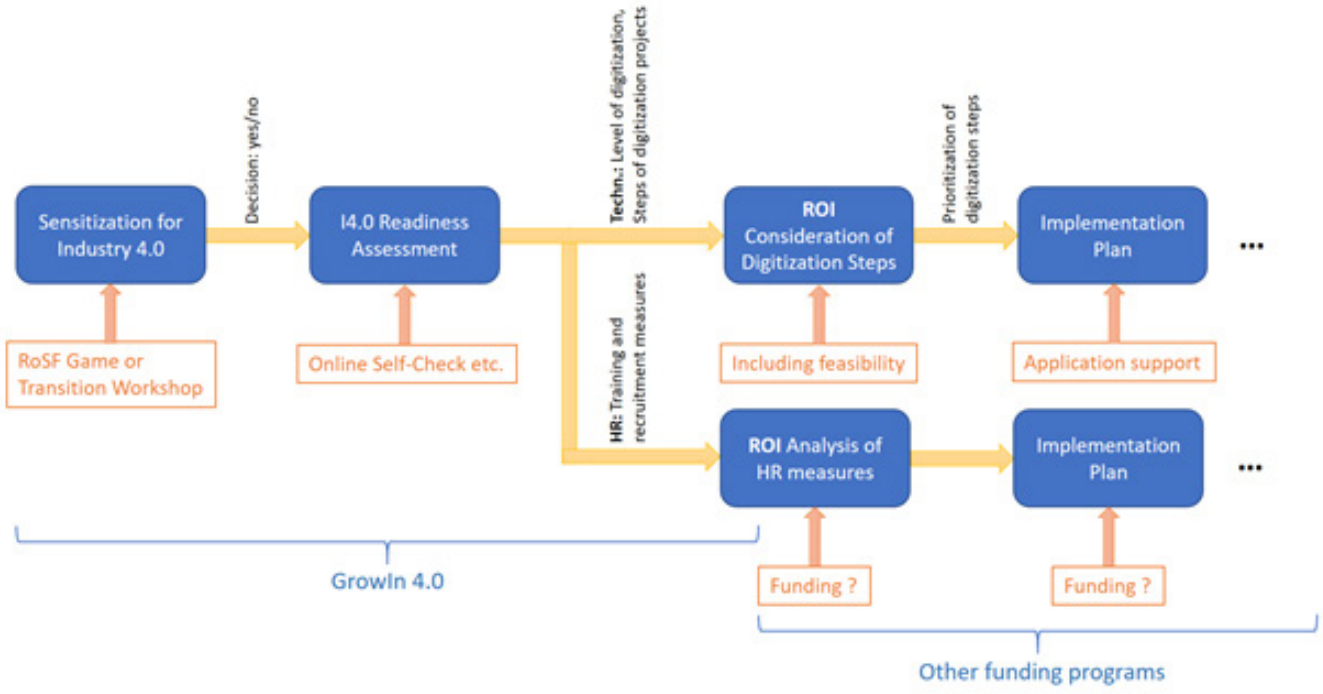
- the tool must be created by a technically trustworthy developer
- every partner must be able to test the tool alone in advance
- the tool must have a motivating effect for SMEs (result / output is a benefit for SMEs)
- the duration of every tool execution must match requirements of the proceeding plan (short and effective... SMEs don't have an unlimited amount of time to test different tools)
- "learning curve": the training effort for every partner should be minimal
- the interim results must be saved, so they can be "recycled" any time

For the totality of all tools tested in a single SME should be noted:

- the tools must not have remarkable overlaps (SMEs could feel hoaxed)

Example: testing individually selected tools in an SME

The following flowchart shows the individual steps of testing selected tools in an SME:



Selection and readiness of best practices / tools

Finally, four of these tools have been selected to be tested in SMEs on behalf of WP4:

BEST PRACTICE	Type	Applied in...
Made Different	I4.0 assessment tool	pre-phase
Facilitation in CDR	project management	(permanent)
Innovation Camps	project management	planning phase / implementation phase
IMPULS Industry 4.0 Readiness Online Self-Check	I4.0 assessment tool	pre-phase

Annex: Register of tools found by WP4

Descriptions for all found / selected tools can be found on the following pages.

Cybersecurity Scan

1. General information		
Title of the tool	***Cybersecurity Scan***	
Main institution involved	Partners of the national Smart Industry platform: FME, Ministry of Economic Affairs and Climate, Chamber of Commerce, Koninklijke Metaalunie and TNO.	
Location of the practice	Country	Netherlands
	NUTS 1	This is a national tool which has been launched 1th June 2018
	NUTS 2	
	NUTS 3	

2. Detailed description	
Detailed information on the tool	*Please provide information on the tool itself. In particular:* ▪ *Short description of the tool* ▪ *Function of the tool and which competencies are measured* ▪ *Give examples of applications within education and or industry* The Dutch national Smart Industry platform has launched a Cybersecurity Scan. The scan focusses on the production environment (the operational and technological domain) and gives insight in the cybersecurity of the company. The scan does also gives tips on how the company can become cybersecure with the current technology on the factory floor. The risk analysis/scan makes companies aware of the consequences of a cyber incident. The scan raises companies' resilience against cyber-attacks. The Dutch government will soon launch a Digital Trust Centre. Practically, the scan is a questionnaire which companies can fill in online. The Cybersecurity Scan advises companies on three main topics which will increase companies' digital resilience: ▪ Organisation and management ▪ Interaction with systems ▪ Technology The tool itself has five topics: ▪ What is my current situation? Insight in your organisation and vulnerable elements. ▪ What can happen to me? Possible threats and scenarios for your organisation. ▪ What have I arranged? How resilient are you already at the moment for these threats? ▪ What am I going to do now? Advices and tips to increase the resilience of your organisation. ▪ More information. Links to websites, tools and documents with more information. The Smart Industry platform advises companies to fill in the scan every 6 months to check whether there are new topics which require measures.
Resources needed	*Please specify the amount of funding/financial resources used and/or the human resources required to implement the tool* The tool is freely available through the website of the Smart Industry platform (https://regelhulpenvoorbedrijven.nl/cybersecurityscan/) and soon via the website of the Digital Trust Centre. It is unknown yet to what extend other countries are free to make the tool available for their companies, but no barriers are expected on this. The tool should be translated. And some possible country specific information should be adapted.
Timescale (start/end date)	The Cybersecurity Scan has been launched on 1th of June 2018. It has no end date so far.
Evidence of success (results achieved)	*Why is this tool considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* The tool has been recently introduced. So it still has to prove its success.

Difficulties encountered/ lessons learned	The tool is very low profile and can be assessed by companies themselves. It needs no guidance/support of a consultant e.g. The tool has been recently introduced. So it still has to prove its success. The tool is currently only available in Dutch.
Potential for learning or transfer	*Please explain why you consider this tool (or some aspects of this tool) as being potentially interesting for other regions to learn from. If possible, relate to other provided tools /knowledge provided in this project GrowIn 4.0 and generate suggestions for applications.* It is a general and well evaluated tool that covers issues that are relevant for all manufacturing firms in western countries. It is composed in that way that it is relevant (unavoidable) to all firms.
Further information	https://www.smartindustry.nl/smart-industry-lanceert-cybersecurity-scan/ https://regelhulpenvoorbedrijven.nl/cybersecurityscan/
Contact details	
Name	*N.A.*
Organisation	*Smart Industry, and* *Ondernemers Advieslijn*
Email	*info@smartindustry.nl* *contact person Northern Netherlands Region: Northern Netherlands Alliance, Marit den Ouden (denouden@snn.nl)*

Consensus workshop method

Title of practice: Consensus workshop method (www.ica-uk.org.uk)	
Detailed description	*Please provide information on the practice itself in particular:* ▪ *What is the problem addressed and the context which triggered the introduction of the practice?* ▪ *How does the practice reach its objectives and how is it implemented?* ▪ *Specific information for each WP* The VIA ICT Engineering Bachelor Project method is continuously improved by the Danish VIA ICT Engineering department and Danish SME's. More info on: https://www.via.dk/ The VIA ICT Engineering Bachelor Project method is split up into 2 phases: BPR1 and BPR2. BPR1 : The purpose of the course is to prepare the student for the Bachelor Project. In preparing the Bachelor Project, students learn to recognize important sets of problems within the professional area, alternative solutions to them and the demands of companies and their environments. In the course, the students are taught how to apply scientific knowledge and work methods to their own field in new and changing situations. They also learn to communicate orally and in writing on questions related to the area of research, as well as methods for collecting data and testing their solutions. Each bachelor project group must consist of 2-3 students. It is recommended to find the project in association with an external company or organization. BPR2: The purpose of the Bachelor Project 2 is to evolve the student's ability to solve a relevant ICT Engineering problem and document the solution. In a group, students must be able to analyze, design, implement and test complex problems and be able to carry out well-documented and tested solutions. According to make SME digitalization project in GrowIn 4.0 the SME's are in a similar situation as the bachelor project students even thou the educational starting points and project period length might be different. In the SME company's and for the ICT students it is recommendable to start with small analyse of employees/ICT students interest, capability, maturity and mutual chemistry to make the best possible teams for the project execution. When SME teams are created and the project idea is generally defined then it's time to start the formalised project work for the real analyse verification, coding and validation.

	In The GrowIn 4.0 we need a tool or more coherent tools to enhance the ten Industry 4.0 competencies as defined by the World Economic Forum, such as creativity, people management skills, communication skills, team collaboration and problem solving skills to learn (capability) how to handle- and (maturity) how to manage the digital technology (make use of CMMI). The digital technology must be an integrated as a culture change (Lewin model). To adhere to the GROWIN project goals we need a tool or method suitable for improving soft, hard and knowledge skills and make the connection between the strategic development tools and IT knowledge tools in WP 3 and 4.
Area of I4.0	Could be the level of I4.0/digitization the practice is focusing on ▪ As stated in the Lewin model the end user's motivation/interest is crucial for the success of the project. ▪ Stage 1: Make team with similar interests. ▪ Stage 2: The project team's members' capabilities / skills must be updated to the needed digital technology levels (SWOT analyze). ▪ Stage 3: The digital technology must start as pilot projects to reach team members confidence. Create idea and qualify it by use of brainstorm, Divergent / Convergent, The six thinking hats and SMART principle. ▪ Stage 4: follow the Bachelor project process and documentation template for the consensus projects Requirements, Analysis, design, coding, test phases. ▪ Remember to celebrated the short and long term winnings. Team capabilities Make team capability by using the SWOT tool. A SWOT analysis is a relatively simple but effective tool that can help you analyze the capabilities of your team and pinpoint where there's room for improvement. SWOT stands for: **SWOT: Strengths, Weaknesses, Opportunities, Threats.** **Strengths** Close customer contact Engagement Local knowledge Good reputation **Weaknesses** Poor profiling Liquidity Heavy Investment Theoretical background **Opportunities** New markets New Products Technological development Environmental Interests Communicate environmental awareness Seizing the public by extending business More training Invest when interest rates are low **Threats** Competition Rising interest rates Invest Ring Needs Profile of products by specialization Profile products Establish operational communities

Brainstorm

Use this template for the initial capture and review /revision of the brainstormed ideas. As the ideas are discussed, you can also capture any associated comments or follow-up tasks. If you need to prioritize items to help the team know what's important to focus on, you can use the ranking column to record their consensus rank.

Potential Uses:

- *To identify possible causes of a problem.*
- *To generate possible improvement suggestions or alternatives*
- *To begin a discussion of business, system, application, or other types of requirements.*
- *To generate ideas around functions or features desired in a new tool, application, product or service.*
- *To define all the tasks necessary to build an action plan*
- *To collect key points from various discussions occurring in sub-teams.*
- *To demonstrate to members of a polarized group that there are more than just two competing alternatives.*

Brainstorm template

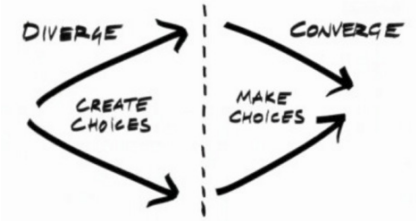
Type the question or problem being brainstormed here

#	IDEA	COMMENTS / FOLLOW-UP TASKS	RANK
1	*Use this column to capture the initial brainstorming responses. ..*	*Use this column to capture any comments or follow-up task needed to further research or clarify the idea. Each task should identify a responsible party & due date.* ▪ ▪ ▪	*Use this column to rank items so you can focus on the highest priorities. The ranking scale should be identified prior to brainstorming exercise.* *For example:* *H – High* *M – Medium* *L – Low*
2			
3			
4			
5			
6			

Convergent and Divergent Thinking Styles

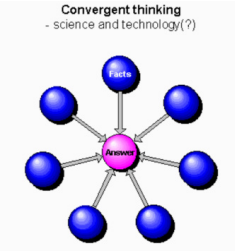
"Convergent" and "divergent" thinking represent two different ways of looking at the world.

1. A convergent thinker sees a limited, predetermined number of options (word "converging" = "coming together").
2. By contrast, a divergent thinker is always looking for more options (word divergent = "developing in different directions").

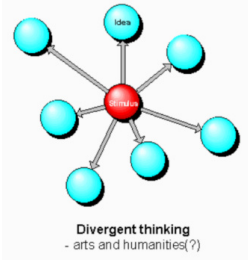


Many of us get stuck in convergent thinking and, as a result, don't see the many possibilities available to us. Let's have a look at both types of thinking.

Convergent Thinking Styles:



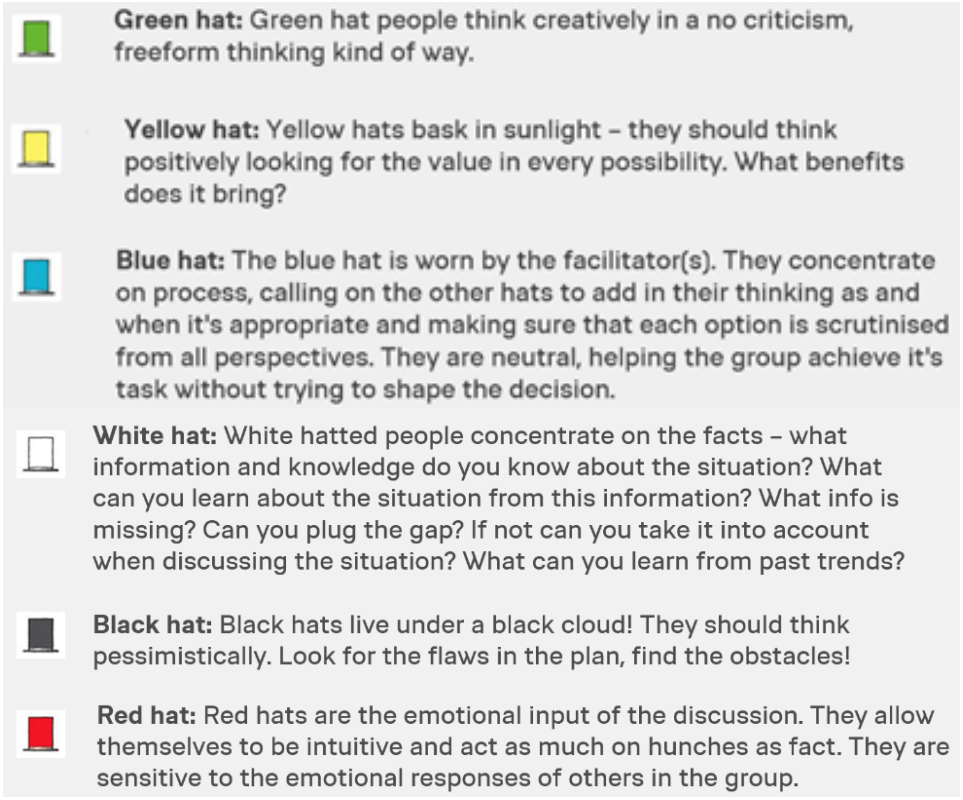
At "convergent" thinking the person is good at bringing material from a variety of sources to bear on a problem, in such a way as to produce the "correct" answer. This kind of thinking is particularly appropriate in science, maths and technology.
Divergent Thinking Styles:



At "divergent" thinking the persons skill is in broadly creative elaboration of ideas prompted by a stimulus, and is more suited to artistic pursuits and study in the humanities.

Six Thinking Hats – Quality check

Each of the Six Thinking Hats represents a different direction or type of thinking, which is identified by a color. The roles the 'hats' bring give you a chance to thoroughly examine every option and to priorities or choose the best one(s).



This tool actively seeks out the optimistic analysis, the pessimistic analysis etc., so every idea is thoroughly tested and when the decision is made, it's made on the basis of a creative and thorough process.

	SMART principle Set **S**pecific Goals. Research shows that specific goals are the most motivating. A specific goal is to reduce your 5K time by 30 seconds within 6 months. Many people just say they want to get faster. This goal is far too general to really motivate you in your training. Set **M**easurable Goals. Simply saying that you want to get faster is not enough detail. You need to be able to chart and document progress toward your goal. One way to measure your progress is to document your performance at set intervals. In the above example you may want to time your 5K performance once a month so you have a good measurement. Set **A**djustable Goals. This means your goals are flexible enough to accommodate unexpected challenges without becoming obsolete. An injury may force you to modify your goal. If you goal is too run a certain marathon and you are injured, you may need to change your goal to do the half marathon, or some other event. An injury doesn't need to mean you abandon all your plans. At the same time, you may find you are progressing quickly and need to raise your goal. Set Action-Oriented Goals Another important aspect of goal-setting to to keep them focused on personal action. Don't forget to consider not only what you want to achieve, but how you plan to achieve it. Consider reading How to Design a Personal Exercise Program and The Principles of Sports Conditioning for tips on fitness training plans. Set **R**ealistic Goals. Start where you are, and increase your goals accordingly. If you haven't ever run a 5K it's probably not a wise goal to say you want to run a marathon. While that may be your long-term goal, in the short-term you may want to shoot for the 5K and 10K and half marathon on the way to your marathon goal. This sort of progression is healthy and realistic. Also, keep in mind that as you become more and more fit and near your full potential the room for continued improvement gets smaller. Similarly, if your goals are too simple, you won't feel much satisfaction by attaining them. Only you truly know what is realistic for you. Set **T**ime-based Goals. Look again at first example: reduce your 5K time by 30 seconds within 6 months. This is specific and time-based. Without a time line there is a tendency to procrastinate or get bored. You may also need to set interim goals with shorter timelines to keep you on track. Consider the previous example of working up to a marathon by completing shorter distances first. each of those because a separate goal with a shorter timeline. In general, goals that stretch out beyond 6 months are too long to keep you interested and motivated. Try to re-evaluate your goals every 2-3 months. Goal setting is an art as well as a science, but if you make sure your goals follow the S.M.A.R.T. formula, you will find you are more likely to stay motivated and reach goal after goal.
Evidence of success (results achieved)	*Why is this practice considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* In more than 500 projects the VIA ICT Engineering method has been proven very effective and very popular for SME companies, students and VIA university College. It's easy to understand and the documentation is kept to a minimum.
Difficulties encountered/ lessons learned	*Please specify any difficulties encountered/lessons learned during the implementation of the practice.* The VIA ICT Engineering bachelor project method is regularly updated with new and better features after dialog with SMEs. The tool is generic and can be used for GrowIn 4.0 WP3, WP4 and WP5.

Potential for learning or transfer	*Please explain why you consider this practice (or some aspects of this practice) as being potentially interesting for other regions to learn from. This can be done e.g. through information on key success factors for a transfer or on, factors that can hamper a transfer. Information on transfer(s) that already took place can also be provided.* The ICT bachelor project method is transferable and easy to apply. The ICT Engineering course descriptions for BPR1 and BPR2 are available including the project report and process manual/template. In the ICT Bachelor projects the SCRUM model is used for the agile process handling and the V-model is used for documentation purposes. (PDF attachment of project template and process report).
Target group	*Specify the target group of the practice at if possible the level of I4.0/digitization.* Cross sectoral SME's with Industry 4.0 interest to improve company by use of digital technology.
Nature	*Please explain whether the practice is a tool for SMEs to use themselves, a method used by ex. consultants, a program having a broader objective etc.* The pilot SME digital technology project must be supervised by experienced ICT Engineering project teacher together with company and ICT bachelor project students. Dependent on the company's employee's capabilities and maturity needed for the project it might be recommendable to contact a public course provider. It's very important to keep all the employees motivated for digital technology introduction in company and to encourage them all to make progress in this area. Celebrate the short and long term winnings and don't even try to threaten or scare them.
Proposal for modifications/sustainability	Please describe if there are suggestions of how to make the practice even better, and how the practice can evolve, need orientation, is integrated into the ecosystem/Smart specialization strategy and is supported by the community. #1 workshop: The idea is to start digital technology introduction into company by use of small pilot project(s). It's like introducing a new tool or to run a new game. Start with step-by-step tutorial to get familiar with the technology's advantages disadvantages and then try to find area in a company where the employees are motivated for trying out the new digital technology in their own environment. #2 workshop: When the employees are curious to learn more about the digital technology start by facilitating the procedure described in the previously described "Area of 4.0 frame".
Resources needed	*If applicable - please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.* The ICT Engineering bachelor project method is for free for the companies.

	This means the pilot project VIA supervision and help from VIA students are for free, but if the companies employees need education courses to handle the new digital technology then that is on the company's bill.
Further information	*Link to where further information on the good practice can be found* https://studienet.via.dk/sites/uddannelse/ict/horsens/studymaterial/Pages/default.aspx
Contact details	
Name	Poul Vaeggemose Associate Professor + B.Sc. E.E. + M.Sc. Media Design.
Organisation	VIA University College, Campus Horsens, DK, EU.
Email	pov@via.dk

Made Different

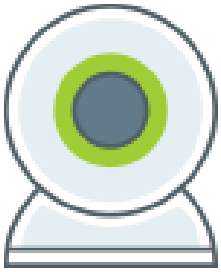
Title of good practice:	Made Different programme by Agoria/Sirris (B)
Detailed description	Seven years ago, Agoria and Sirris proudly created the Made Different programme. For much more detail and movies, see http://www.madedifferent.be/en. Seven transformation domains were selected to receive financial support from the Flemish government. Once the programme was successfully completed, these manufacturing companies would become Factories of the Future. The programme has since been extended to Wallonia and the food, textile and furniture industries have joined the programme. Belgium currently has twenty Factories of the Future. These show that smart automation and digitization can lead to sustainable growth in a manufacturing company in a country such as Belgium.

	During the next three years, Agoria and the selected partners will start up the following activities within the new project, funded with 2M Euro by the EC, and implement these for the European manufacturing industry: 1. Development and testing of a coherent European methodology to help transform (SME) manufacturing companies into Factories of the Future. 2. Promoting this methodology through communications and intensive training courses to a wide variety of European innovation partners. 3. Setting up learning networks of Factory of the Future champions. 4. Establishing and promoting a European Advanced Manufacturing Support Centre. 5. Organising a European Factory of the Future Award event.
Area of I4.0	The Made Different programme covers all of the transformations needed for SMEs to evolve to I4.0 readiness. 
Evidence of success (results achieved)	With more than 20 companies certified, among which many SMEs, the approach has been well accepted in the whole of Belgium, and is now expanding via the Interreg Fokus project into the Netherlands, and with the in May announced EC funding into the rest of Europe. The common and simple terminology, supported by well-made movies, lowers the threshold to explain the concepts to SMEs. The Open Manufacturing Campus (OMC) has set up in 2014-2015 seven well-attended Symposia around these transformations with SMEs where the theory was explained, but also its application in both larger and smaller companies (see the OMC website for all presentations: http://openmanufacturingcampus.com/EN#kenniscentrummenu)

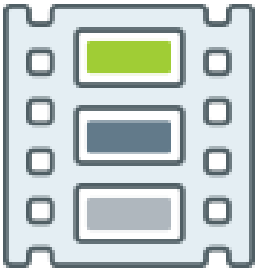
Difficulties encountered/ lessons learned	It takes a lot of effort to motivate especially SMEs to invest effort in Industry 4.0 trainings and attending related events. But consistent and easy to understand communication has made the Made Different approach a reference where the visible progress of champion SMEs stimulates other SMEs to also attend and grow into I4.0.
Potential for learning or transfer	By spending our Growin4.0 efforts towards SMEs along the same lines and reusing most of the available material our project could help in developing and testing a coherent European methodology to help transform (SME) manufacturing companies into Factories of the Future. With relatively low investments a similar effect as reached at the Belgian level could be expanded into the Norts Seas region.
Target group	SMEs that want to transform to an I4.0 structured approach.
Nature	There are 3 major steps in the approach: 1. companies can position themselves based on a web-based questionnaire tool in a kind of "I4.0 spider web tool" 2. With Growin 4.0 we can organize events in the different regions to increase the knowledge level and stimulate SMEs to grow in this I4.0 approach. 3. If SMEs want to get a "Factory of the Future" certificate, and if Growin4.0 wants to promote this as well, we need to get together with Agoria to see whether this is possible within the current context/budget.
Proposal for modifications/sustainability	Translation to local languages in the North Sea region (e.g. Danish and German) would enhance the communication to local SMEs.
Resources needed	Unless we would also implement step 3 (in section Nature above), we judge that this can be realized with the current Growin 4.0 resources.
Further information	http://www.madedifferent.be/en
Contact details	
Name	Marc Corthout Business Development Manager
Organisation	Open Manufacturing Campus (OMC) vzw
Email	Marc.corthout@openmanufacturingcampus.com

TechSmith CAMTASIA

1. General information		
Title of the tool	**TechSmith CAMTASIA**	
Main institution involved	VIA University College	
Location of the practice	Country	Denmark
	NUTS 1	Drop-down list
	NUTS 2	Drop-down list
	NUTS 3	Drop-down list

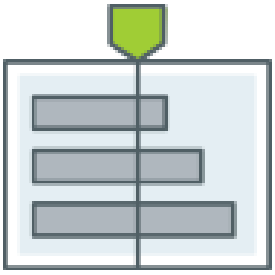
2. Detailed description	
Detailed information on the tool	*Please provide information on the tool itself. In particular:* ▪ *Short description of the tool* ▪ *Function of the tool and which competencies are measured* ▪ *Give examples of applications within education and or industry* **Camtasia** is a software suite, created and published by TechSmith, for creating video tutorials and presentations directly via screencast, or via a direct recording plug-in to Microsoft PowerPoint. The screen area to be recorded can be chosen freely, and audio or other multimedia recordings may be recorded at the same time or added separately from any other source and integrated in the Camtasia component of the product. Both versions of Camtasia started as enhanced screen capture programs and have evolved to integrate screen capture and post-processing tools targeted at the educational and information multimedia development marketplace. Camtasia consists of two major components: ▪ Camtasia Recorder - a separate tool for capturing screen audio and video ▪ Camtasia editor - the component for which the entire product is named, which is now a multimedia authoring tool with the industry standard "timeline" interface for managing multiple clips in a stacked track form plus enhancements summarized below. Easy To Use Editing Features  **Screen Recorder** Record your entire screen, or just a single window.  **Webcam**

The webcam recorder lets you add a personal touch to your video.



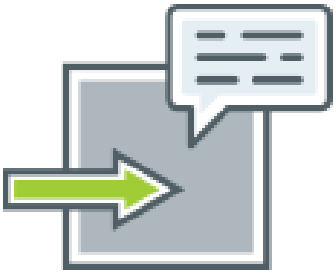
Media

Import images, audio, and video up to 4K resolution.



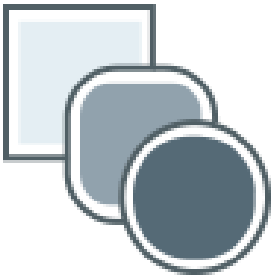
Multi-track Timeline

Build your videos quickly with multiple tracks for images, video, text, and audio.



Annotations

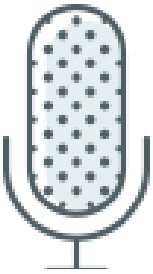
Arrows, callouts, shapes, and more help you get your point across.



Transitions

Add an intro/outro to the beginning or end of a clip, image, shape, or text.

Animations
Zoom, pan, or create your own custom motion effects.

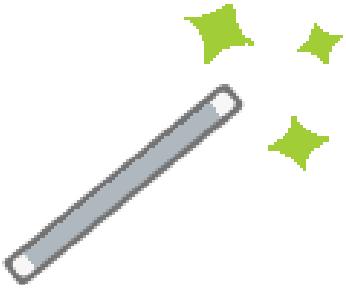


Voice Narration

A great way to add context to what you're showing.

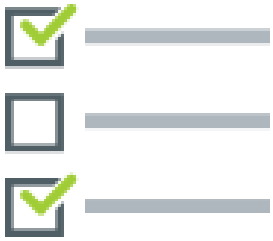
Audio Effects

Add audio effects to recordings, music, or narration to enhance your video.



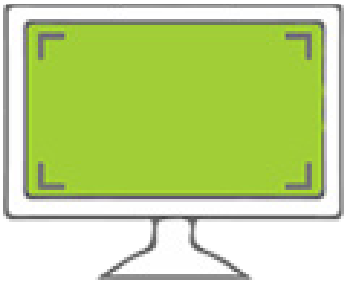
Visual Effects

Adjust colors, add a drop shadow, change the clip speed, and more.



Interactivity

Add quizzes to see who is watching your videos, and how much they've viewed.



Green Screen

Put yourself in your video making it appear like you're right in the action.

Examples of applications:
When the end user are operating on a web application the operators behavior, eye movements, keyboards kliks and voice can be recorded for analyseing how intuitive the user interface can be handled. The tool is very efficient to display handling of UI.

VIA University College have used this tool with great success for UI quality assurince. By using the Monaco princile you only need 8 persones statisticly use of the UI to find 80% of the the most ovius (trend) errors on UI. For bigger populations the results becomes even better.

Demo Link:
http://discover.techsmith.com/camtasia-brand-desktop/?gclid=CjwKCAjwsJ3ZBRBJEiwA-tuvtlHszy0MFjRFJY9d_byV8N_1cY-JA-zybFhtpGiL55mf6xtVUDmpLPxoCZKYQAvD_BwECZKYQAvD_BwE

Resources needed	*Please specify the amount of funding/financial resources used and/or the human resources required to implement the tool.* *System Requirements, Camtasia (Windows)* ▪ Microsoft Windows 7 SP1, Windows 8, and Windows 10 (Required: 64 Bit versions only) ▪ 2.0 GHz CPU with dual-core processor minimum (Recommended: Quad-core i5 processor or better) ▪ 4 GB RAM minimum (Recommended: 8 GB or more) ▪ 2 GB of hard-disk space for program installation ▪ Display dimensions of 1024x768 or greater ▪ Microsoft .NET 4.6.0 or later version (included) ▪ Dedicated Windows-compatible sound card, microphone, and speakers (Recommended) ▪ Windows N requires the MediaFeature Pack for Windows N
Evidence of success (results achieved)	*Why is this tool considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* Over 14 Million Camtasia Users
Difficulties encountered/ lessons learned	Very convincing tool to optimising the UI quality
Potential for learning or transfer	*Please explain why you consider this tool (or some aspects of this tool) as being potentially interesting for other regions to learn from. If possible, relate to other provided tools /knowledge provided in this project GrowIn 4.0 and generate suggestions for applications* Very easy to use also for non-experienced PC users.
Further information	
Contact details	
Name	Poul Vaeggemose
Organisation	VIA University College, Denmark
Email	pov@via.dk

Unity

1. General information		
Title of the tool	***Unity***	
Main institution involved		
Location of the practice	Country	Denmark
	NUTS 1	Drop-down list
	NUTS 2	Drop-down list
	NUTS 3	Drop-down list

2. Detailed description	
Detailed information on the tool	*Please provide information on the tool itself. In particular:* • *Short description of the tool* • *Function of the tool and which competencies are measured* • *Give examples of applications within education and or industry* **Tool:** Unity is the world's leading content-creation engine. More than an engine, Unity offers everything you need to build beautiful and engaging content, boost your productivity, and connect with your audience. Tools and resources include continuous engine updates, multiplatform support, and documentation, forums and tutorials. **Products:** Level 1: Unity Personal: For beginners, students and hobbyists who want to explore and get started with Unity. Level 2: Unity Plus: For creators who are serious about bringing their vision to life. —$35 per month. Level 3: Unity Pro. For professionals who need complete flexibility and crave advanced tools and customization. —$125 per month. **Demo:** Unity 2018.1: Graphics rendering, next-gen runtime, and more artist tooling. Link: https://unity3d.com/unity **Description of the tool:** The Unity tool are used at VIA University College and at most danish companys working with AR/VR/MR digital visualisation. Unity is a cross-platform game engine developed by Unity Technologies, which is primarily used to develop both three-dimensional and two-dimensional video games and simulations for computers, consoles, and mobile devices. First announced only for OS X at Apple's Worldwide Developers Conference in 2005, it has since been extended to target 27 platforms. Six major versions of Unity have been released. Function of the tool (Read more at link: https://unity3d.com/unity) Rich & Extensible Editor: Art & Design tools Graphics Rendering Engine Performance Platforms Virtual and Augmented Reality Unity Asset Store Multiplayer Team Collaboration Unity Connect Live Ops Analytics Performance Reporting

Examples of applications:

Heatpump service: Together with Insero Best Green VIA have made PoC for Augmented reality and virtual reality using Unity 3D tool to visualization of advanced heatpump service made in spring 2017, look at Link: https://innovationsfonden.dk/en/node/1601.

3D glasses should help technicians to find errors. 3D visualization should make it much easier to find fault on heat pumps, thus minimizing the downtime of the systems. The heat pump systems of the time are becoming more and more complex. Thus, it has also become more complicated for technicians to diagnose errors that occur in the systems.

It would be best for Best Green to find a solution and therefore started a collaboration with VIA University Collage in early 2017. Together we fully developing a technique that will enable visualization of the complex data in heat pump systems. The parties have chosen to take the basis of Augmented Reality and Microsoft HoloLen's brilliance technology, which can provide the technician with a simple and clear visualization of the intricate heat pump systems.

"It's about converting the large amounts of data from our heat pump to something that service people can see and almost touch. The technology is still at a development stage, but the perspectives are not to be missed".

The technology also allows you to view real-time data and operating status and rewind the time and show where the error originally occurred. It is a knowledge that could significantly ease the technician's workload.

With the Microsofts Hololens glasses we can convey the data from our heat pump system in a way that is understandable for both service engineer, engineer and heat pump supplier. It opens up new oppor-tunities to remedy or improve the operation of our heat pumps".

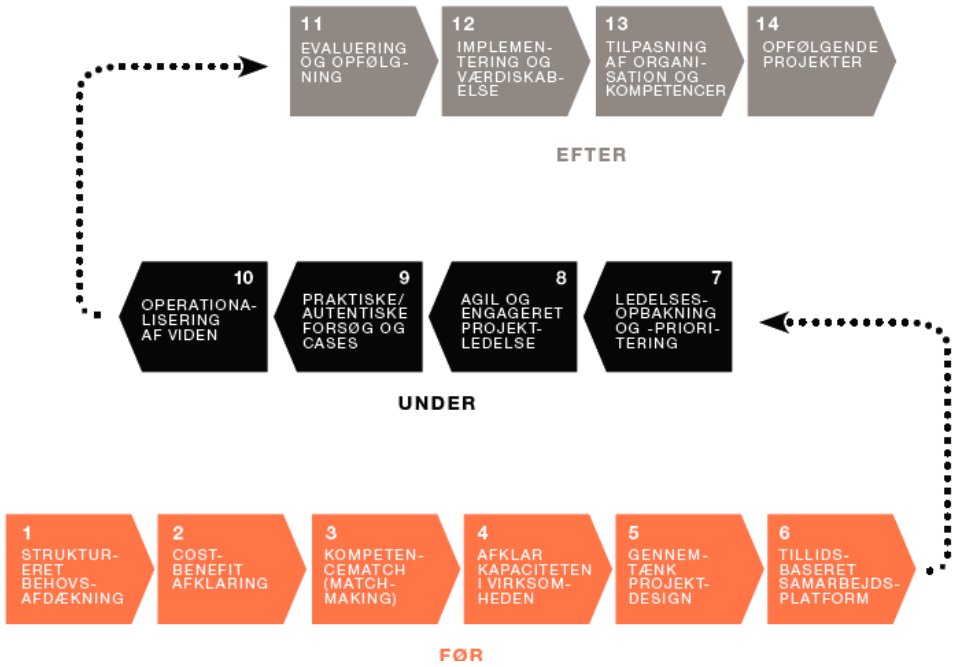
Demo Link: https://innovationsfonden.dk/da/nyheder-presse-og-job/3d-briller-skal-hjaelpe-teknikere-med-finde-fejl

Resources needed	*Please specify the amount of funding/financial resources used and/or the human resources required to implement the tool.* Project management: 9700 Euro Data access and implementation: 12000 Euro Development of a system for overview of component components in heat pump systems and integration of real-time data from heat pumps 34400 Euro Augmented Reality visualization of operating data. 28733 Euro Test and adapt solution in collaboration with installer on user design 12000 Euro --- Total 96833 Euro ========== **Time schedule:** Project management Period: 01.03.17 – 31.07.17 Data access and implementation Period: 01.03.17 – 31.03.17 Development of a system for overview of component components in heat pump systems and integration of real-time data from heat pumps Period: 01.03.17 – 30.04.17 Augmented Reality visualization of operating data. Period: 01.04.17 – 15.05.17 Test and adapt solution in collaboration with installer on user design Period: 15.06.17 – 31.07.17
Evidence of success (results achieved)	*Why is this tool considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* The expected functionality was fulfilled with big success. The Unity 3D tool worked perfectly together with the Microsoft 3D HoloLens glasses. The downtime for Heat pumps are reduced and the service technician can make use of the visualization of what happened before, under and after the defect was observed. This is a unik help for service of the heat pumps not only for the service technician but also for the heat pump manufacture to remotely observe realtime and historicly data from the individual heat pumps. It was the first project Microsoft HoloLens was used for practical service instead of gaming. We have not received the financial service reduction values by now, but Insero Best Green have very optimistic expectations.
Difficulties encountered/ lessons learned	No Unity 3D difficulties/effects observed and no HoloLens glasses difficulties defects was observed.
Potential for learning or transfer	*Please explain why you consider this tool (or some aspects of this tool) as being potentially interesting for other regions to learn from. If possible, relate to other provided tools /knowledge provided in this project Growln 4.0 and generate suggestions for applications* The Unity 3D tool makes the visualisation look almost like making the 3D objects a live/real.

Further information	Microsoft HoloLens organisation have made more cases together with Insero Best Green bases on the Unity 3D practical implementation success.
Contact details	
Name	Poul Vaeggemose
Organisation	VIA University College, Denmark
Email	pov@via.dk

Facilitation

Title of practice: Facilitation in Central Denmark Region	
Detailed description	*Please provide information on the practice itself in particular:* ▪ *What is the problem addressed and the context which triggered the introduction of the practice?* ▪ *How does the practice reach its objectives and how is it implemented?* ▪ *Specific information for each WP* In Denmark, there is an increased focus on the use of knowledge collaborations in business environment. More and more enterprises prioritise collaborating with knowledge institutions on development and innovation. Considering that enterprises who collaborate with knowledge institutions perform considerably better than those who do not, this is hardly a surprise. But knowledge collaboration is far from easy. The following is the most obvious challenges when SMEs and knowledge institutions work together: ▪ Talks different language – science versus commercial ▪ Have different objectives, culture, and time frames ▪ The willingness to convert theoretical knowledge to commercial products and services ▪ A trust-based relationship ▪ A well thought out project design Knowledge collaboration is a diverse entity that cannot be accounted for in a simple formula. There are various objectives and types of collaboration (e.g. student project, knowledge services, innovation projects, research project, user-driven upskilling). Therefore, Central Denmark Region has in some years worked with neutral facilitation as a key element in our innovation programs. In general, Central Denmark Region found that it is useful viewing a knowledge collaboration from a "before-during-after" perspective. The figure below, called the three phase model, shows 14 critical points in a knowledge collaboration. The 14 points are not equally important in all projects. But this overview is a great checklist that may serve as a supporting tool during the process in most collaborations. The 14 points will each be elaborated in the appendix.



Often, the process of maturing, preparing and follow-up is just as important as the knowledge collaboration itself. The value for the enterprises might be limited, if all the phases are not handled in a competent and conscious matter.

Central Denmark Regions experiences shows that external facilitators may play a significant role in benefitting fully from the collaboration – especially for enterprises with little or no experience in knowledge collaboration. Furthermore, both international and national research underline the importance of neutral facilitation in all project phases as a mean to achieve a successful innovation project.

Thus, cluster organisations, innovation networks, business promotion actors, and support functions at the universities often have insights that are beneficial in guiding the enterprises and the collaborators through the points in the figure above.

Being a good facilitator demands certain personal and professional skills in regard of managing dynamic meetings, and group processes. E.g. it is important that the facilitator can motivate the participating actors and (of course) make the right match of SME(s) and knowledge institutions. Additionally, it is important to match the expectations of both SMEs and knowledge institutions, and make sure that the SMEs experience a return from the projects.

Area of I4.0

Could be the level of I4.0/digitization the practice is focusing on

We know that collaborations between enterprises and knowledge institutions results in great value. However, we also know that it is still only relatively few small and medium-sized enterprises (SMEs) that get involved in knowledge collaboration, even considering that this number seems to have been increasing during recent years. Furthermore, the full benefits of the knowledge collaborations are often not collected. It may result in many challenges when researchers or teachers and SMEs with very different goals, cultures and time frames have to collaborate and convert theoretical knowledge into commercial value. Therefore, facilitation will in general make knowledge collaboration/innovation projects and specific technology transfer from knowledge institution to SME easier and realize more benefits.

Evidence of success (results achieved)	*Why is this practice considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* **Shortcut to new knowledge:** This good practice is based on an innovation program called "Shortcut to new knowledge", that Central Denmark Region initiated in 2011 and completed in 2014. The overall aim was to promote innovation in SMEs through knowledge collaboration in order to create the basis for growth and potential commercial profit. As a condition the SMEs involved should not have prior experience from interaction with knowledge institutions. The programme received a very positive evaluation from those involved in the various collaborations. Many of the SMEs achieved ready for market, products or prototypes, and thereby reached their aims for the collaboration. In addition, many SMEs gained new knowledge, new network, improved business opportunities, and new project possibilities. But the programme also highlighted the need for a neutral, third party facilitator to help the collaboration between the SMEs and the knowledge institutions. **Knowledge bridges for growth:** The three phase model is the result of an analysis about knowledge collaboration in Denmark. The analysis is called "Knowledge bridges for growth". Based on in-depth studies of 50 successful knowledge collaborations, the analysis has provided the content for the three phase model "Before-during-after".
Difficulties encountered/ lessons learned	*Please specify any difficulties encountered/lessons learned during the implementation of the practice.* The results from Shortcut to new knowledge showed that knowledge collaboration can create innovation and a basis for growth and development for various kinds of SMEs. But the results also showed that knowledge collaborations are complex and multi-faceted projects often with many participating actors. Therefore, the evaluation of the project recommended neutral, third party facilitation. Here a point to pay attention to is that you need qualified and committed facilitators.
Potential for learning or transfer	*Please explain why you consider this practice (or some aspects of this practice) as being potentially interesting for other regions to learn from. This can be done e.g. through information on key success factors for a transfer or on, factors that can hamper a transfer. Information on transfer(s) that already took place can also be provided.* This Good Practice is fairly easy for other regions to learn from and directly implement – to the benefit of both companies and knowledge institutions. One possibility could be to implement an education in facilitation that builds upon the competencies already existing in the region.
Target group	*Specify the target group of the practice at if possible the level of I4.0/digitization* Entering into continuous in-house R&D activities may be a particular challenge for small firms. They will have to bear high fix costs such as setting up a separate R&D laboratory, meet minimum scale requirements of effective R&D activities and have to deal with high sunk costs in case of stopping R&D. Since the nature of R&D implies high uncertainty of its outcome, devoting large resources to R&D may jeopardise the whole enterprise in case R&D investment fails. Given these restraints, SMEs without a R&D department will be the main target group for knowledge collaboration projects.

Nature	*Please explain whether the practice is a tool for SMEs to use themselves, a method used by ex. consultants, a program having a broader objective etc.* Facilitation is a method used by consultants at cluster organisations, innovation networks, business promotion actors, and/or support functions at the universities.
Proposal for modifications/sustainability	*Please describe if there is suggestions of how to make the practice even better, and how the practice can evolve, need orientation, is integrated into the ecosystem/Smart specialization strategy and is supported by the community.* In Central Denmark Region, we have implemented facilitation in our innovation prgrams where three SMEs and at least one knowledge institution collaborate. In order for the facilitation to be fruitful we offer an education in facilitation to all our cluster organisations, innovation networks, business promotion actors, and support functions at the universities, who are operators at our innovation programs.
Resources needed	*If applicable - please specify the amount of funding/financial resources used and/or the human resources required to set up and to run the practice.* An example is our Smart Industry innovation program. In this program we have earmarked 0.5 million DKK (approximately 67.000 EUR) to facilitating the application process and 1.6 million DKK (approximately 215.000 EUR) to facilitation the 10 knowledge collaboration projects, that the program encompasses.
Further information	*Link to where further information on the good practice can be found*
Contact details	
Name	Finn Pedersen
Organisation	Central Denmark Region
Email	Finn.Pedersen@ru.rm.dk

Innovation camps

Title of practice: Innovation camps	
Detailed description	*Please provide information on the practice itself in particular:* ▪ *What is the problem addressed and the context which triggered the introduction of the practice?* ▪ *How does the practice reach its objectives and how is it implemented?* ▪ *Specific information for each WP* The practice was introduced in the food sector through the Future Food Innovation consortium in Central Denmark Region. Because of changes in the focus of SMEs, governments and consumers (health and food waste, environment and sustainability, global warning and energy optimisation, digitization etc.), there was a need for the SMEs to change their way of innovating. The development of the practice was based on the intention to motivate the corporation between educational institutions and SMEs in new ways – with the intention to increase collaboration and value creation on both sides. During an Innovation camp, students from one or several educational institutions work in groups on one or several business cases. Based on a given subject and basic knowledge of the business cases (SMEs involved) the students work in groups on generating ideas and solutions for the SMEs. Several ideas are generated, SMEs help to focus on specific ideas and the students continue to work on these. The creative process and development of ideas can be put into 5 phases: 1. Focusing on business cases/companies challenges 2. Creation of ideas 3. Summing up and decisions 4. Development of selected ideas 5. Assessment of ideas Innovations camps can span from 1 day to 2 weeks. In other words, it is a sprint that helps answer critical business questions through rapid prototyping and user testing. Sprints let the company reach clearly defined goals and deliverables and gain key learning, quickly. The process helps spark innovation, learn new ways of thinking through the students, and motivate the employees to try new methods and technologies. Some important aspects are: ▪ It is important that the educational institutions assure, that the students acquire information on the SMEs involved before the actual innovation camp, ▪ In most cases it is relevant to have more than one group working on the same SME-case. In this way more ideas are generated, which is more beneficial for the SME, ▪ Presentation of ideas and solutions for teachers and SMEs several times during the workshop, ▪ Interdisciplinary groups can be beneficial for both students and SMEs, but requires more from teachers, ▪ It is important to follow up on all ideas and solutions – not only the ones being developed further – and give this knowledge to the SMEs, ▪ It might be relevant to discuss the opportunities for the SMEs to further develop or implement ideas and solution after the Innovation camp.

Area of I4.0	*Could be the level of I4.0/digitization the practice is focusing on.* Could be on any relevant issues that SMEs are interested in – and very relevant regarding knowledge transfer/technology transfer and competence development.
Evidence of success (results achieved)	*Why is this practice considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* From 2013 – 2015 Future Food Innovation has been running 14 Innovation camps with 500-600 students, 70-80 teachers and 50-60 companies. Evaluation of the practice showed: ▪ Companies has found new inspiration, concrete ideas, prototypes and solutions ▪ Companies has acquired new knowledge on specific topics as well as knowledge about education and competences ▪ Students has acquired concrete knowledge on business world ▪ Teachers has acquired business cases for their teaching ▪ Personal relations have been obtained
Difficulties encountered/ lessons learned	*Please specify any difficulties encountered/lessons learned during the implementation of the practice.* Lessons learned: ▪ To increase the needs of the companies, it is important to establish open collaboration between educational institutions ▪ It is important to establish impartial sparring to insure reconciliation of expectations and follow up ▪ It is important to offer students and teachers as temporary innovation expertise to the companies ▪ Increase the capacity of the educational institutions as sparring partner for the companies Difficulties encountered: ▪ The frame of educational activities limits the capacity of the educational institutions to engage heavily in collaboration with companies – primarily for the benefit of companies ▪ Reconciliation of expectations are important from both sides
Potential for learning or transfer	*Please explain why you consider this practice (or some aspects of this practice) as being potentially interesting for other regions to learn from. This can be done e.g. through information on key success factors for a transfer or on, factors that can hamper a transfer. Information on transfer(s) that already took place can also be provided.* This Good Practice is fairly easy for other regions to learn from and directly implement – to the benefit of students, companies and educational institutions.
Target group	*Specify the target group of the practice and if possible the level of I4.0/digitization.* The target group is SMEs with the ambition to innovate. The SMEs can both be at a beginner level in regards to Industry 4.0 – and seek help to utilise the possibilities Industry 4.0 offers, but also be advanced in regards to Industry 4.0, who can create new ideas and solutions for products or services.

	Furthermore, the target group is educational and knowledge institutions with expertise in Industry 4.0 and an interest in collaborating with the SMEs.
Nature	*Please explain whether the practice is a tool for SMEs to use themselves, a method used by ex. consultants, a program having a broader objective etc.* The practice can be offered by public authorities who design knowledge collaboration projects/programs. The practice is relevant to implement for educational institutions and innovation facilitator.
Proposal for modifications/sustainability	Regarding the GrowIn 4.0 project, specific focus on topics for Innovation camps must be in the industry 4.0 area.
Resources needed	For a full day workshop that includes everything from searching for companies, identification of relevant topics, student recruitment, preparation, running the workshop, follow-up/evaluation with companies and students - and possibly reporting: Total hours of facilitator: 80-100 hours Financing for running the workshop incl. meals: € 2,000 – 3,500 (depends on number of participants and costs for premises, materials etc.)
Further information	Here you can read more about Future Food Innovation in general: http://www.futurefoodinnovation.dk
Contact details	
Name	Pia Nissen
Organisation	Central Denmark Region
Email	Pia.nissen@ru.rm.dk

Connected Production I4.0 maturity test

1. General information		
Title of the tool	***Connected Production I4.0 maturity test (web-based) - DESELECTED!***	
Main institution involved	Vision Lasertechnik GmbH, bluebiz OHG, UNIORG Group.	
Location of the practice	Country	Germany
	NUTS 1	*This is a national tool, launched in 2016*
	NUTS 2	
	NUTS 3	

2. Detailed description	
Detailed information on the tool	*Please provide information on the tool itself. In particular:* ▪ Short description of the tool ▪ Function of the tool and which competencies are measured ▪ Give examples of applications within education and or industry The platform of three main institutions (mentioned above) has launched an online Industry 4.0 maturity test. The assessment focusses on six different departments of the SME and gives insight in the I4.0 maturity: ▪ Development & Research ▪ Production ▪ Logistics & Storage ▪ Administration ▪ Sales ▪ Customer Service ▪ The scan also advises on how the company could reach the next step(s) towards Industry 4.0 by adding or modifying current technologies on the factory floor and in the other departments. Practically, the maturity test is a questionnaire that SMEs can fill in online. The I4.0 maturity test ranks SMEs by seven different maturity levels: ▪ manual operation ▪ partly digitized ▪ network-driven structured ▪ automated ▪ predictable operation ▪ autonomous operation Main questions of the maturity test: ▪ Where does the SME use computers and to which extent? ▪ Which departments of the SME are connected via network? ▪ Where does the SME use automated or maybe autonomous processes? ▪ ...
Resources needed	*Please specify the amount of funding/financial resources used and/or the human resources required to implement the tool.* The tool is freely available through the website of Connected Production (https://www.connected-production.de/industrie-4-0-reifegrad-test/). It is unknown yet to what extend other countries are free to make the tool available for their companies, but no barriers are expected on this. The tool has to be translated to English language.
Timescale (start/end date)	The connected-production.de Maturity Test has been launched in 2016. No end date is set so far.
Evidence of success (results achieved)	*Why is this tool considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* Validation of the tool's algorithm and the success is only known to the main institutions. **DESELECTED!**

Difficulties encountered/ lessons learned	The tool is low-profile and can be assessed by companies themselves. It needs no guidance/support. The tool has been published in 2016. Validation and success are unknown (company-owned). The tool is currently only available in German.
Potential for learning or transfer	*Please explain why you consider this tool (or some aspects of this tool) as being potentially interesting for other regions to learn from. If possible relate to other provided tools /knowledge provided in this project GrowIn 4.0 and generate suggestions for applications.* It is a general tool that covers maturity issues, relevant for all manufacturing SMEs in western countries. The questions are composed in a way that it is relevant to all SMEs.
Further information	https://www.connected-production.de/industrie-4-0-reifegrad-test/
Contact details	
Name	Philipp Becker
Organisation	Vision Lasertechnik GmbH
Email	websales@vision-lasertechnik.de (Contact at Ostfalia, WP4: Dennis Haarmeyer, M.Eng., E-Mail: de.haarmeyer@ostfalia.de)

IMPULS Industry 4.0 Readiness self-check

1. General information		
Title of the tool	***IMPULS Industry 4.0 Readiness self-check (web-based)***	
Main institution involved	VDMA, IW Consult, FIR e.V. at the university of Aachen	
Location of the practice	Country	Germany
	NUTS 1	*This is a national tool, launched in [?]*
	NUTS 2	
	NUTS 3	

2. Detailed description	
Detailed information on the tool	*Please provide information on the tool itself. In particular:* ▪ Short description of the tool ▪ Function of the tool and which competencies are measured ▪ Give examples of applications within education and or industry The platform of three main institutions (mentioned above) has launched an online Industry 4.0 maturity test. The assessment focusses on six different departments of the SME and gives insight in the I4.0 maturity: ▪ Data driven services ▪ Human Resources ▪ Strategy and organization ▪ Smart Factory ▪ Smart Operations ▪ Smart Products The scan also advises on how the company could reach the next step(s) towards Industry 4.0 by adding or modifying current technologies on the factory floor and in the other departments. Practically, the maturity test is a questionnaire that SMEs can fill in online. The I4.0 maturity test ranks SMEs by six different maturity levels: ▪ Outsider ▪ Beginner ➔newcomer ▪ Advanced ➔ first time user ▪ experienced ▪ expert ▪ excellent ➔ pioneer Main questions of the maturity test: ▪ Does the SME use technologies/ systems and which ones? ▪ Which departments of the SME are connected via network? ▪ Where does the SME use automated or maybe autonomous processes? ▪ How does the SME organize IT and what does the SME for IT safety?
Resources needed	*Please specify the amount of funding/financial resources used and/or the human resources required to implement the tool.* The tool is freely available through the website of the Impuls foundation (https://www.industrie40-readiness.de/?lang=de). It is unknown yet to what extend other countries are free to make the tool available for their companies, but no barriers are expected on this. The tool has already been translated to English language.
Timescale (start/end date)	The Impuls I4.0 Readiness check has been launched in ?. No end date is set so far.
Evidence of success (results achieved)	*Why is this tool considered as good? Please provide factual evidence that demonstrates its success or failure (e.g. measurable outputs/results).* Validation of this tool are several studies which provide necessary information about industry 4.0 and its development. The studies being used are divided in 3 main topics: economical and regulatory policy, education and innovation and further topics regarding the future. They can be classified as reliable since they all have been executed by the VDMA Impuls foundation.

Difficulties encountered/ lessons learned	*[300 characters only can be included online – try to prepare an overview that complies with the limit. However, you can add further details here in the word template. Please keep the 300-summary and the additional information clearly separated.]* The tool is low-profile and can be assessed by companies themselves. It needs no guidance/support. The tool has been published in ?. Validation of the test are studies by the VDMA foundation which are mentioned above. The tool is currently available in German and English.
Potential for learning or transfer	*Please explain why you consider this tool (or some aspects of this tool) as being potentially interesting for other regions to learn from. If possible, relate to other provided tools /knowledge provided in this project GrowIn 4.0 and generate suggestions for applications.* It is a general tool that covers maturity issues, relevant for all manufacturing SMEs in western countries. The questions are composed in a way that it is relevant to all SMEs. The tool askes for information about the SME (size, industrial sector, sales of the year) to categorize the SME and compare it (based on the studies) to similar companies. This makes the tool concrete and useable for several different SMEs.
Further information	https://www.industrie40-readiness.de
Contact details	
Name	Dietmar Goericke
Organisation	VDMA (organization of German mechanical engineering)
Email	Dietmar.g**oericke@vdma.org** **(Contact at Ostfalia, WP4: Dennis Haarmeyer, M.Eng.** **E-Mail: de.ha**armeyer@ostfalia.de)

Who is involved?

More information: https://northsearegion.eu/growin4/