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A Toolbox for Strategic Leadership of Innovative Networks:

Seven pieces of advice for good network management – and four exercises to establish and revitalize networks

Vestlandsforsking - report

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Researcher(s) Jon Gunnar Nesse, Ingjerd Skogseid and Øyvind Heimset Larsen	**Project coordinator** Øyvind Heimset Larsen
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Summary

Sogn og Fjordane University College (HSF) and Vestlandsforsking (VF) collaborated in the project "Innovation in Rural Places - Conditions and Barriers". The project was co-funded by the County Authority of Sogn og Fjordane, and the Norwegian Research Council under the VRI programme, as well as the two collaborating institutions contributed considerably with own financing. The project has resulted in reports, feature articles, book chapters, presentations and articles. Both the County Authority and other stakeholders have expressed special interest in developing a tool which incorporates new knowledge developed in the project.

The County Authority of Sogn og Fjordane suggested Sogn og Fjordane University College (HSF) and Vestlandsforsking (VF) should collaborate in this development. The development agreement should contribute to creating more and larger research projects within the two institutions, assist in developing competencies at Ph.D. and full professorship level, as well as strengthen the scientific research development at HSF and VF through international cooperation and networking. Through one of the subprojects under this development agreement, we have developed a simple, first version of a toolbox for developing, renewing and operating innovative networks. The toolbox is theoretically based, but should be easily accessible and relevant to both business stakeholders and public policy funding schemes.

Other publications from the project

The Norwegian version of this report is VF Report 9/2016.
The report is using data from other publications in "Innovation in Rural Places – Conditions and Barriers".

- VF Report 2/2014 "Innovasjon i Sogn og Fjordane – vilkår og barrierar – Sluttrapport'" (Innovation in Sogn og Fjordane County – conditions and barriers – Final report)
- VF Report 3/2014 "Innovasjon i Sogn og Fjordane – vilkår og barrierar – Dokumentasjonsrapport" (Innovation in Sogn og Fjordane County – conditions and barriers – Documentation report)
- VF Paper 1/2014, 9/2014, 10/2014 and 11/2014 Functional analysis of networks
- VF Paper 2/2014 Bedriftsutviklingstiltak: Evaluering av tre ulike tiltak (Business development initiatives: Evaluation of three different initiatives, VF Paper 3/2014 Labour market, VF Paper 4/2014 Study of the literature, VF Paper 5/2014 Collection of articles

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Foreword

This Toolbox was developed after completing the research project: “Innovasjon i Sogn og Fjordane – vilkår og barrierar” (Innovation in Sogn og Fjordane County – conditions and barriers) (Nesse et al., 2014). The project received financing from the County Authority of Sogn og Fjordane and The Norwegian Research Council as a part of the VRI programme focusing on innovation in Norwegian regions. The research project was carried out under collaboration between Vestlandsforsking and Sogn og Fjordane University College[1], as well as the organisations contributed with own financial resources to the project. The VRI programme was implemented in three phases. The programme we are indicating here is part of the second phase (2011–2014), with further reference: VRI2.

VRI2 explored the existing innovation systems in the county, the development of innovative networks, and how the two are related. We applied a so-called functional analysis of networks, a method recognized internationally (Bergek et al., 2008; Heydebreck et al., 2014), and developed further by us.

Our research findings in VRI2 led us to define a set of tools which may be useful when dealing with innovative networks and innovative processes across businesses. Some of the tools, if not all, may also be useful to individual businesses. We need to underline here that this toolbox is not an alternative, but rather a supplement to the handbooks on networks published by, for example, Weberg Kåsa and Brustad, 2009.

The contracting body, which has observed and followed up many different networks in the county, was also given the opportunity to give its input on the toolbox during the process.

The target group was anyone working to achieve cost-effective, commercially oriented collaborations around innovation and restructuring of industries. This work is anchored in the County of Sogn og Fjordane’s plan for value creation, where development of innovative networks is among the priorities. To achieve this ambition, knowledge and competencies about the practical operation of networks are necessary. This is the objective of the toolbox.

The Authors from the left: Ingjerd Skogseid- Vestlandsforsking, Jon Gunnar Nesse- Sogn og Fjordane University College & Øyvind Heimset Larsen- Vestlandsforsking

[1] From January 1 2017, Sogn og Fjordane University College is a part of Western Norway University of Applied Sciences

Chapter 1. The background for the toolbox

Innovation in Rural Places – Conditions and Barriers (VRI2, 2011–2014)

This toolbox represents a practical summary of our experience, methodology and research findings from our VRI2 project in Sogn og Fjordane County. The project explored the existing innovation systems in the county, the development of innovative networks, and how the two are related. Our research findings led us to define a set of tools which may be useful when dealing with innovative networks and innovative processes across businesses. Some of the tools, if not all, may also be useful to individual businesses.

It should be mentioned that there are also other useful handbooks on network cooperation, including Weberg Kåsa & Brustad (2009), "Håndbok for vurdering og gjennomføring av nettverksprosjekter" (Handbook for evaluation and implementation of network projects' developed for Innovation Norway). The primary content in this handbook is the assessment and selection of network projects, management and administration of network projects, and follow-up and reporting on network projects. There is limited overlap between our toolbox and the Weberg Kåsa and Brustad handbook. In terms of innovation and risk management, there is a certain overlap regarding the themes, but these themes are handled differently. Therefore, we see this toolbox as a supplement to the Innovation Norway handbook on network cooperation.

Through VRI2 we used the dynamics (functions) mentioned above to map the functionalities of five networks. We evaluated functionality by performing a SWOT analysis, which examines strengths and weaknesses, threats and opportunities. The results of the SWOT analysis were used to identify driving forces and barriers to innovation in the networks. We also used functional analysis considered as a "best practice", in a report from the EU/Interreg program on regional innovation systems (Heydebreck et al., 2014, pp. 10–12).

Choosing the network

In the spring of 2012, we conducted an initial mapping of innovative networks active in Sogn og Fjordane County. This was done via interviews with representatives from 25 of 26 municipalities in Sogn og Fjordane County (In the last municipality we were unable to contact the right person). As a result of the mapping, we have identified 117 networks. The networks were reviewed by the researchers and led to collection of more information about the networks enabling classification.

After a careful sampling process, we were left with four networks and two business cases: IT Forum Sogn og Fjordane, the Fruit and Berries Network in Sogn og Fjordane, The Jostedalen Business Network, Sogn og Fjordane Energy Region, and the business cases Hellenes and Sogn Aqua. Beware of the fact that since both the Jostedalen business network and Sogn og Fjordane Energy Region were relatively new networks, they were not as far along in their innovation activities as the IT Forum and Fruit and Berries networks.

Thus, we had four networks and two business cases to map and analyze more closely. From the preliminary mapping of 117 networks, we had acquired a certain amount of basic information. We supplemented this basic information with available secondary data (first from websites and the organization database ravninfo.com, and thereafter also through internal documents from the networks and business cases).

We obtained the most crucial information via in-depth interviews with key players in the networks and business cases. Through our interviews with network leaders or secretariats, we gathered further information and gained access to more secondary data. These initial interviews were especially important to obtain a general overview of the people involved in the network (list of names), and receive tips about which interviewees would be best suited. In our business cases, there were contact persons in management who were willing to provide the information we needed.

A PRESENTATION OF THE CASES

All five cases are located within the County of Sogn og Fjordane. The cases vary in size (number of members), geographic reach, purpose and extent of innovation focus.

Case: The Jostedalen Business Network (BJ)

- Established in 2012

Innovation Norway, Sogn og Fjordane aims to facilitate the development of more market-oriented and competitive offers of adventure tourism in Sogn og Fjordane. Through business networks, they try to strengthen the innovative power, competitiveness and profitability through existing collaborations between businesses, by offering financing and access to knowledge resources. Four networks within the field of thematic tourism attractions and experience took part in the pre-project, and three of them participate in a three-year main project. In addition to the business network in Jostedalen, there is one network connected to Gulen Dykkersenter (Diving Centre) in Gulen/Bergen, and one network connected to Bratt Moro (Steep Fun) in Sogndal.

Small businesses in a tiny rural community include the businesses in Jostedalen's tourism sector cooperating to a greater or lesser extent for decades. Through Innovation Norway's business network project, the businesses have formalized this collaboration, and defined objectives, established a board of directors and a general manager in a part-time position. The main objective of the Jostedalen Business Networkis to improve the shoulder seasons by offering new product packages.

Case: Sogn og Fjordane Energy Region (ESF)

- Established in 2012

The initiative to establish the Sogn og Fjordane Energy Region came from the Sogn og Fjordane Business Network in 2010. In 2011, the County Authority of Sogn og Fjordane funded preliminary research to probe the interest among businesses. This network aims to bring together actors from different part of the value chain in the production of renewable energy, in order to take better advantage of their potential and increase value creation in the county. This was the background for applying for "Arena status" from Innovation Norway in 2012. The application received positive feedback but didn't win.

The work done in the network was largely concentrated around the "Arena" application. In addition to a general manager, a consultant and a secretary have been working here during certain periods. Moreover, members' meetings with paid speakers have been organized about once a year. The network management wanted to try a new "Arena" application in 2014. If this were to happen, the basic premises of the applications needed to be improved by engaging more thoroughly the participating businesses in the network. A consultant with experience from an Arena project in Hordaland County was enlisted to assist in this work. No new application resulted from this.

This is an example of a network which is relatively new and where there is a deliberate attempt to construct the network, rather than a network developing spontaneously. In this way Sogn og Fjordane Energy Region illustrated the problems that may occur when trying to establish a new network.

Case: Sogn og Fjordane IT Forum (IT-F)

- Established in 1995

Jan Per Styve from Vestlandsforsking, and Oddvar Flæte, the County Governor of Sogn og Fjordane, took the initiative to establish this network. At the time, several businesses in the county were invited to participate, among these, the County Authority of Sogn og Fjordane, the Public Roads Administration, Sogn og Fjordane University College, KS and Vestlandsforsking. The network was more directed at IT users than to IT developers or the IT industry, and this is still the case today, although it is more common for representatives from the IT industry to be in the network. IT forum is the oldest network we have studied, and it is a complex network with a shifting history, and where many different stakeholders and businesses are involved.

The IT Forum aims to initiate, coordinate and be a driving force for activities that promote rational and development-driven use of information and communication technology (ICT) in business and public sectors, and thereby also for the inhabitants of Sogn og Fjordane County. More specifically, the network should strengthen and develop cooperation and coordination among agencies, organizations and businesses in the county.
IT Forum has been purpose-driven and worked long-term. It has, among others, contributed to relocating government jobs to the County of Sogn og Fjordane, and to the 300 million NOK investment into broadband infrastructure in the county.

Case: Sogn og Fjordane Fruit and Berries Network (FBN)

- Established2001

The network and industry related to the production of fruit and berries in Sogn og Fjordane is rooted in traditions that go back to the Viking Era (Starheim, 2009). Around the turn of the millennium the earnings were low, as was the mood in the industry, and many asked whether to continue or terminate (Brendehaug et al., 2000). However, in the years after the turn of the millennium, both the production and the economy have experienced an upward swing.

The revenue from the six major varieties of fruit and berries increased from less than 20 million NOK in 2002, up to about 97 million NOK in 2012. In 2009, Sogn og Fjordane County became the largest fruit and berries producer in the country, by revenue, a position it has held since. The development within the production of raspberries and sweet cherries has been especially good; about half the current revenue comes from raspberries. This progress is the result of many different factors, but extensive network collaboration is a key component. It has been possible to cultivate a stronger team effort locally, in the individual rural communities, as well as regionally, between the rural communities and business/industries. Especially during the past five years, this collaboration across geographic, sectorial and business boundaries has been a success.

Case: Sogn og Fjordane Marine Industry (MSF)

During the initial network mapping based on interviews with heads of economic development and public chief executives, we were surprised that no one indicated any networks within the marine sector. There were also conversations about this with Sogn og Fjordane County Authority, and the conclusion was that there were few networks in this industry. Seafood production is an important industry in Sogn og Fjordane, and was one of the target areas in the County Authority's value creation plan towards 2025 (Sogn og Fjordane County Administration, 2014). This project therefore chose an alternative approach. Instead of studying an already established network, we contacted businesses in the marine industry, Sogn Aqua and Hellenes, to find out more about how companies in the industry conduct their networking. Sogn Aqua's business is halibut farming, and Hellenes provides process solutions to the marine industry, among others. Through this contact, we received information about a marine network in the establishment phase, Marint Vekstforum (Marine Growth Forum).

From a methodological point of view, we mapped the marine sector based on two individual businesses called "egocentric network analysis" (Borell & Johansson, 1996) in order to find out how these businesses engage in networks with others and how they cooperate with public funding bodies. Each of these businesses has been quite visible in the region, through press coverage about innovations and development, and both use R&D to improve their products, reach new markets and develop unique products. From our previous contact with these businesses, we knew that both use their networks actively.

Innovation Ecosystems and Innovative Networks

Innovation networks

Tidd and Bessant (2009) define various types of innovation networks. The cases we've studied and learnt from for this toolbox span across several different types:

Entrepreneurs' networks: A combination of formal and informal mechanisms, centered on the idea's owner. It often depends on the energy and enthusiasm of the idea's owner (the entrepreneur) in getting people interested to join in and stay in. Provides access to both knowledge and financial resources (BJ, MSF).
Internal networks and project teams: These are often cross-disciplinary and resemble to entrepreneurs' networks quite a bit. The difference is that these develop within one organization. This requires that the individuals have time, motivation and incentive to speak to together (IT-F).
Communities of practice: Centered on one specific kind of knowledge, often has both internal and external participants (IT-F).
Spatial clusters: These develop as a consequence of participants being located in close geographic proximity, such as in Silicon Valley (BJ, FBN).
Sectoral network: These have members located within the same industry or technology sector, and have as their purpose to improve competitively in the specific sector (BJ, MSF, ESF, FBN).
New product or process development consortium: Knowledge sharing to develop new products, technologies and processes. The challenge here is to find partners that can contribute with ideas and be good collaboration partners (FBN, MSF).
Emerging standards groups: These are centered on developing new industrial standards.
Supply chain learning: Learning and development of best practices that occur in a value/supply chain (BJ, MSF, ESF, FBN).

Much of the research literature points to collaboration between industry/trade, research and development, and the public sector as a means to increase value creation. The Triple helix model describes three spirals twisted around each other. These spirals represent industry, the public sector and research – or action, financing and knowledge –three factors that are essential for innovation.

However, the triple helix model with three equally large sectors doesn't quite fit in areas like Sogn og Fjordane County. This county is not only sparsely populated buts also "organizationally sparse". In other words, we have many small businesses, few R&D agencies, and vast distances. Typically, public organizations in Sogn og Fjordane County will always be large compared to most businesses. Network collaboration around development in Sogn og Fjordane County may be considered to be a complex but dynamic innovation ecosystem. Participants in this ecosystem are groups within research and higher education, private and public agencies, and these exist on a local, municipal, regional and national level. In a network such as an innovative ecosystem, the participants will be equally dependent on each other. When they interact, and one party is successful, the other parties will be successful too, at least over the time.

In the VRI2 Sogn og Fjordane research project, we focused on functions we consider important to make the network collaboration in an innovative ecosystem function well. First, joining and participating must be seen as attractive. Second, the network needs to develop new knowledge and share it among its participants. Third, it is necessary that innovation actually occurs through the network. In other words, something new needs to be produced by the network, something that would not have been possible without the network – for instance, products, procedures or ways of organizing.

Fourth, the network needs legitimacy. Participants and others outside the network alike have to see the network as credible and positive. The fifth point relates to the ability to mobilize resources. The network needs the ability to elicit funding, build contacts and knowledge in a more effective way than what the single participant would be able to do. Sixth, the network needs to be useful beyond the ones who participate. The knowledge and products they have developed should be useful also to others. If a freeloader is discovered, this is a sign that the network has been a success. Finally, the network needs to be tied together by developing the relational resources – by connecting the right people.

These features are the background for the toolbox described in this booklet. Networking is quite simply a set of actors (e.g. companies and others that are shown in the triple helix model) with collaborative relationships among themselves. We imagine this collaboration is formalized by the presence of certain objectives and guidelines for this collaboration, as well as management of the network. By innovative networks we mean networks of businesses that drive innovation and which contribute to economic development in a way that wouldn't be possible if the businesses operated separately. Examples of innovations may be new or better products, new markets, new inputs, new processes or forms of organization. "New" may in this context imply varying degrees of novelty, from rather small to revolutionary changes. The former is more common than the latter.

Introduction to the Toolbox

The contents of the toolbox, which is inspired by Bergek et al. (2008), is shown in figure 1. Defining the network's status implied securing an overview of who takes part, the relations between these, objectives and policies, organization and network management.

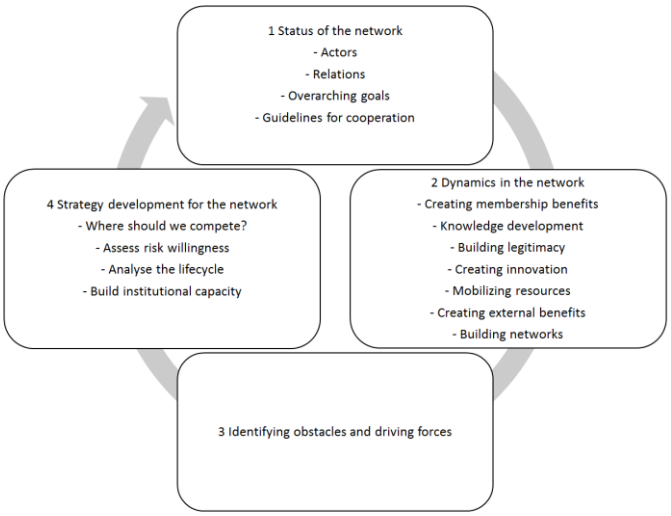

Figure 1. The content of the toolbox in context

The network dynamics involve the abovementioned functions. By working on the network's functions, the network will be developed and one will also get a clearer idea of what the driving forces are, and what the barriers to collaboration in the network are. Awareness of driving forces and barriers may be important to the overall strategic work, as well as decisive for the choice of direction for the network, which again will lead to a new status assessment, and so forth.

The tools we present in this paper are linked to the dynamics (the functions) and strategy development in place in order to establish and renew the network. These tools should not be viewed independently of each other. In table 1, we show some of the possible connections between the strategic and the functional tools. The real picture is more complicated than this, because the individual functions will also be connected, as will the strategic tools.

Table 1. Connections between strategic and functional tool (xxx= strong connection, x= to some degree)

Strategic tools Functional tools	What should we pursue?	Assess willingness to take risks	Lifecycle analysis	Building institutional capacity
Creating benefits for members	XXX		XXX	X
Knowledge development	XXX	XXX		XXX
Building legitimacy	XXX		X	X
Creating innovation	XXX	XXX	XXX	X
Mobilizing resources	XXX	X	XXX	XXX
Creating external benefit	XXX	X	X	
Building networks	XXX	XXX	XXX	XXX

Chapter 2. Tools to establish and renew strategic tools:

1. What should we pursue? – The hedgehog concept

Why is this important?

The hedgehog concept is a tool to help us answer what an actor can, should and wants to pursue. The hedgehog concept is thus a device that helps us choose areas for pursuit.

What is the hedgehog principle?

The idea behind is not new, but the tool was presented for the first time as the hedgehog principle in the book "From Good to Great" by Jim Collins (2001). In his book, Collins explains the title, stating that the hedgehog is a smart animal which outsmarts the fox every day. The concept is based on answering three simple questions:

What *can we* do, or what are we be best in the world at?

What *do we want* to do, or what are we deeply passionate about?

What *should* we do, what is our economic engine, or what can we do to create values for the stakeholders in the organization or network?

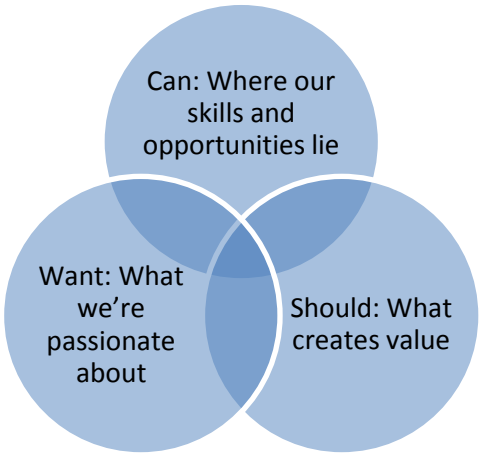

Figure 2. The hedgehog principle: What can, will and should we invest in?

What do we mean by can, should and want to do?

We cannot consider possible measures for innovation and economic development separately from what is "reasonable" to do. The answer to the three questions above should show us what that is.

- Can: What we *can* do will depend on what skills/competencies are available, what we are good at, and what our natural advantages are.
- Want: What we *want to* do is determined by our priorities and wishes, what we are passionate about or really want to engage in.
- Should: What we should do is determined by the market or demand – is there anyone who would buy the goods or services we produce?

This means: We pursue what we may become best at, what we're passionate about, and where we may make money. The ideal position is illustrated in figure 2 where we see overlap between the three circles. The best thing is, of course, to pursue what we can, want to and should do. But if our project is something we should and can do, but don't want to do, then we may have to change our priorities. If it is something we want to and should, but cannot do, we may consider recruiting or developing the skills/competencies we lack. If there is something we can and want to, but should not do, then it's time to think deeply to avoid investing in the wrong thing.

How do we use the hedgehog principle?

We see the hedgehog concept as a useful tool to identify the area that is best suited for mobilizing resources in a region, a network or a business. The three questions may thus be used on different levels – both on the regional level, network level and even business level for that matter. From a practical point of view, this may be done by gathering people with different backgrounds, e.g. different parts of the value chain and the triple helix, in groups where they discuss to determine the answers to the three questions. The starting point may be simple in form, like the one captured in table 2.

Exercise 1: Create one or more groups who work on the questions in table 2

Table 2. The hedgehog principle: Main questions and secondary questions.

Tourism Network "Fjordane"	
Main Question	Secondary question
What can we do?	What are our core skills/competencies? What can we be best in the world at? If we lack some competency, will we be able to acquire this? How?
What do we want to do?	What do we want to do? What are we passionate about? What is our first choice, if we have the opportunity to choose? Can we discuss this in the light of the replies to the other two questions?
What should we do?	What is our market? What does this market have a demand for? What can we make money on? What can't we make money on? Are we aiming at specific niches?

Exercise 2: What are the consequences of what was agreed on in exercise 1?

- Overlap between all three: Natural areas to invest in/pursue
- Overlap between can and should: Consider changing priorities
- Overlap between want to and should: Try to mobilize supplementary resources or recruit competencies that are lacking.

Case

The networks we studied in VRI2 2011-14 were in tourism, renewable energy, marine industries, IT and fruits and berries. All of these are well suited to Sogn og Fjordane County. These are natural areas to invest in/pursue, and this is also reflected in county's Value Creation Plan.

When we look at the network of businesses in the tourism industry in Jostedalen, we can imagine these businesses are passionate about untouched and beautiful nature/wilderness, that they may become experts at guiding visitors in this nature, and that it may be possible to find market segments with customers who are willing to pay well for such nature guiding. See table 3.

Table 3. The hedgehog principle applied to the business network in Jostedalen.

The business network in Jostedalen	
Question	Possible answers
What are we be best at?	Glacier hiking, climbing, canoeing.
What are we passionate about?	Activities in beautiful, untouched nature.
What do we make money on?	Experiential trips for nature enthusiasts with a willingness to pay (full package)

Connections to other tools

It may be beneficial to use the hedgehog concept tool to assess the different phases of development in the network. In the introductory phase, such analysis may be necessary, but the same is true about critical phases where crucial strategic choices are made. Networks that have just been created are in a “formative phase”, which means they need to find their “form” through a learning process. They may consider and copy parts of what others do, but there is likely little to be gained by just copying. Innovative networks are all unique; they all have to absorb characteristics from their own situation and their own members. Well established networks, which have been through this learning process, may have transitioned to a growth or maturation phase. There is no promise that networks live forever, so in some cases terminating the network is the right thing to do.

The hedgehog principle may be a device for figuring out if the network is still viable. If there is no desire to terminate the network, the leaders and participants, especially in mature networks, have to think the situation through: Will restructuring be necessary? Are changes required to achieve new growth? The formative phase and the transition phase are both critical phases, and the public sector has to take on an active role if the hedgehog principle indicates that the network assessed is important for this region. In the growth and maturation phases, the public sector may take on a less prominent role, and to a greater extent leave the field to the businesses in collaboration with R&D. But even then the public sector needs to stay vigilant and ready to respond as necessary.

The hedgehog principle, as an overarching strategic tool, needs to be seen in the context of other tools that are presented here.

2. Assess willingness to take risks

Why is this important?

In a network organization, development is influenced by whether the network is vulnerable or elastic. Is there a willingness to take risk by investing and making oneself (temporarily) vulnerable? In vulnerable networks, participants are highly dependent on each other and can easily fall victim to domino effects. This means that anything that happens in one node of the network will dramatically affect other parts of the network, or the entire network.

An elastic network will often change while focusing on a challenge, but the network will return to its original form after addressing the challenge. This is what many organizations have experienced. They will start a project in order to change something, frequently with external funding. However, when the project is over, there is little left of it – the participants return to what they used to do.

A risk analysis tells us something about how robust the network is. This tool may be used to find the actual position of the network, and the desired position, in order to discover what may be done to move in the right direction.

What is risk analysis?

We have decided to use the term "risk" to capture this balance between vulnerability and elasticity, while "risk analysis" is used for the assessment of where you are situated between the two. There are a number of factors that influence a network's risk. In the following we will emphasize two of these. Network participants may have varying degrees of dependency on each other, and knowledge sharing happens to a varying degree too. Great dependency means there will be close connections between the collaborating parties, e.g. they have to deliver on time, otherwise the collaboration will fall apart. And when a high degree of knowledge sharing is present, the interaction between the parties may be complicated and it is difficult to obtain full overview. This process is illustrated in Figure 3.

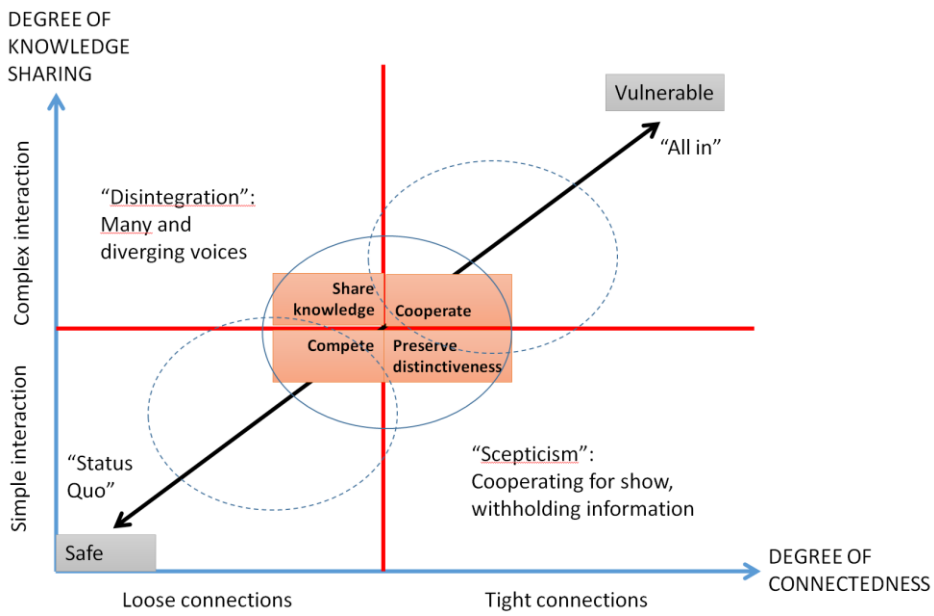

Figure 3. Risk analysis – a balance between what is safe and what is vulnerable

In the lower left corner of the figure, there will not be much development in the network, since its members neither collaborate nor share knowledge. The participants may change their conduct if they are forced to, but will fall back into the old patterns immediately as soon as the pressure is off ("elastic adaptation"). In the upper right area, everyone commits fully, which in a way should be a good thing, but may turn out to be risky due to greater vulnerability. If things go wrong, all will fall. The upper left area of the figure is all talk; no real collaboration emerges. In the lower right area, there is apparent collaboration and tight connections, but the collaboration underperforms because little knowledge is shared. We imagine that the ideal is located somewhere in the middle of the figure, where the participants balance collaboration, knowledge sharing and preservation of distinctive

characteristics. This is indicated by rectangles and a circle in the middle of the figure. The dotted circles indicate that “best location” may vary from one network to the next, and also that the network will move up and down along the diagonal axis in order to find its balance point. Falling outside this axis will lead to a waste of resources and inefficient collaboration in the network.

Why is it important to be aware of willingness to take risks?

The participants in a network may have varying degrees of dependency on each other, and varying degrees of knowledge sharing. Great dependency means there will be close connections between the collaborating parties, e.g. that they have to deliver on time, otherwise the collaboration will fall apart. And when a high degree of knowledge sharing is present, the interaction between the parties may be complicated, making it difficult to have full overview of it.

In the lower left area of figure 3, the network will not develop much, since the participants neither collaborate nor share knowledge. In this case, the participants believe that it is safer to keep going like before, since they then will be independent and can steer their own courses. But this may be a false sense of security. For instance, once the network is confronted with external forces of change, you will have to emerge from your shell and make yourself more vulnerable (move upwards in figure 3) to be able to handle the forces of change in a positive manner. On the other hand, it is not necessarily much better to end up too far to the right in figure 3. Here all participants commit fully, which may turn out to be risky due to greater vulnerability. If things go wrong, all will fall. The upper left area of the figure is characterized by a lot of talk but no real collaboration emerges. The network management may in these cases feel that they are carrying long sticks extending in all directions, as it is hard to keep a steady course. And in the lower right area, there is apparent collaboration and tight connections, but things do not go too well because of a lack of knowledge sharing. We imagine that the ideal is located somewhere in the middle of the figure, where the participants balance collaboration, knowledge sharing and preservation of distinctive characteristics. This is indicated by rectangles and a circle in the middle of the figure. The dotted circles indicate that “best location” may vary from one network to the next, and also that the network will move up and down along the diagonal axis in order to find its balance point.

Exercise 1: Try to place the network in question in figure 3

Exercise 2: What are the consequences of what was agreed on in exercise 1?

Case

Based on the model above, we have tried to position the examined networks (see figure 4). The location of the networks is based on our interpretation of the condition of each single network, which cannot be exact because we rely on given data at interviews and found through other documents.

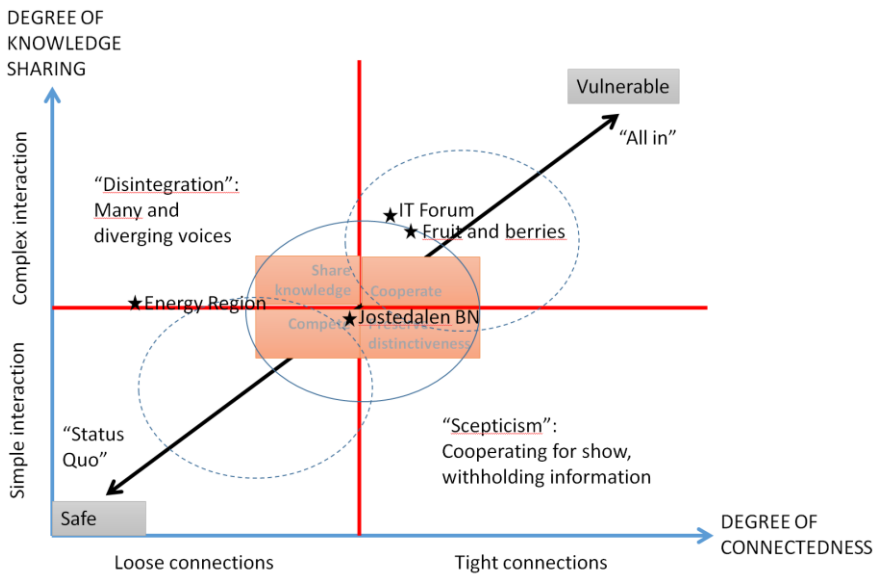

Figure 4. The network cases as positioned in the risk analysis

We assess the Jostedalen Business Network to be well balanced on the whole. It is evident that the flow of knowledge from the outside into the network has been improved through network collaboration. Knowledge is shared internally and new knowledge is received from external stakeholders. There is a certain competition present, which we can see in the work around developing product packages, where everyone wants to have “all” their own products in “all packages”. They all want to preserve their distinctive characteristics but collaborate well in the network as well.

Energy Region Sogn og Fjordane (ESF) is made up of a diverse group of stakeholders, from businesses and from the public sector. This is a new network, and our perception is that no real collaboration has been achieved. There is a low degree of formal collaboration and little knowledge sharing. As a network they have remained in a position with many divergences, the manager of the network probably has a tough job trying to “keep the sticks” together. The members have maintained a safe “status quo” but have not been able to develop the association. This is one of the obstacles for new networks when they start out. It is an art to establish joint activities that strengthen knowledge sharing and collaboration. When examining the members, we see some have had a certain degree of collaboration with some other members, but there is a lack of long-term collaborative relationships to build on. This makes it challenging to start collaborating. Business stakeholders are also competitors to an extent and may be sceptical of each other and of the network, and how the network can contribute to developing their own results. Our experience is that there is a need to establish joint projects with parts of the membership pursuing concrete objectives that will be effective for the businesses. Since this is a relatively new network but with a great potential, these may be just difficulties of initial phase and therefore patience may be necessary.

IT Forum Sogn og Fjordane is a very complex network, or rather a network of networks. Our approach has been to start from the top of the network, and this is the perspective we have viewed it from. The network was established in 1995. The way this network has been organized makes it a robust one, where vulnerability is balanced out through knowledge sharing and collaboration on specific projects. We find that there is little attention on competition and preserving distinctive characteristics among members; everybody has joined the network to work towards a common good. There are many participants, and it’s not always easy for everyone to grasp the ideas behind IT Forum. We see this as development potential for strengthening the network further. The history of IT Forum still shows evidence that the network can stick together and act when faced with both challenges and opportunities.

Likewise, the Fruit and Berries Network in Sogn og Fjordane has a long history that demonstrates their ability to turn around and handle forces of change without leaving themselves vulnerable or making short-lived changes. This network is based on collaboration around a long-term programme which helps secure the basic structure of the industry. It is still noticeable that at the beginning of the Bama project, back in 2001, both network and industry were more vulnerable than they are today. The quality of fruit produced in the county gave reason for discontent. If nothing had been done, both stakeholders in the network and the industry as a whole, would have been more vulnerable than they actually were in 2014.

Connections to other tools

We have to see this in connection with the strategic tool “What should we pursue?”

3. Building institutional capacity in innovative networks

Why is this important?

The institutional capacity discloses something about the ability of the network and its participants' ability to handle external forces of change, or challenges, threats and opportunities. This is about knowing which resources (knowledge and relations) each member has in their network, and having a strategy in place to mobilize these resources to a team that may lead the process of meeting the business's or the network's challenges.

What is institutional capacity?

The literature describes three important components for institutional capacity: knowledge, relations and ability to mobilize. Institutional capacity is something we find in all networks and which tells us something about how the network or the business handles change prompted by external forces. This is a dynamic capacity that may be built, strengthened and developed over time.

By institutional we here imply innovative networks or businesses that participate in such networks, and where participants share a set of values, joint objectives or similar. By *capacity* we here imply the ability the "institutions" have to mobilize to face an external force of change or challenge (threat or opportunity), by using the available knowledge and relations (network) they have.

Why is it important to be aware of institutional capacity?

Everybody, persons, businesses etc. are influenced by external forces of change. In innovative businesses and innovative networks, there is also an opportunity to shape the forces of change in a way that enable them to influence the development locally.

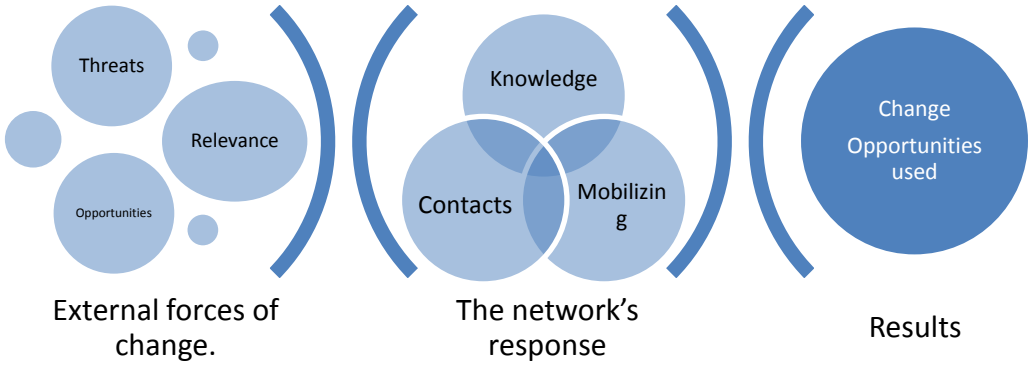

Figure 5. Institutional capacity

Figure 5 illustrates the process of building institutional capacity. External forces of change imply that society is influenced by something external. For the Energy Region network, the decision about the powerline Ørskog-Fardal – a prospect the business sector may see as a threat but also an opportunity. This is a big infrastructure project, and the contractors want large and reliable suppliers. If many national stakeholders enter the local market, local businesses may lose due to the competition. The powerline will also lead to many new hydro-power developments in order to reach the market. If local businesses are to compete over these as well, they have to organize in a new way; they will have to find different ways to collaborate. This was one of objectives when the Energy Region network was established. To get there, they have to use the institutional capacity in the network.

There are three important components for institutional capacity: knowledge, relations and the ability to mobilize.

In the following, we describe each of these three components a little more closely.

- Knowledge and knowledge resources – the broadness of knowledge that is found among those involved in the business or network, and which is continuously developed throughcourses, training, persons etc. or through introducing new ideas or exploring joint ideas.
- Relational resouces – refers to the network itself, and the expanded network, i.e. every participant knows each other. The relations between the actors in a network are developed through common meeting points, joint activities and joint projects. Here, the participants learn to know each other, and connect more closely. The ability to attract and engage new actors keeping them interested over a longer time is a key for the institutional capacity.
- The ability to mobilize – access to knowledge and relational resources are prerequisites for developing a sustainable institutional capacity. These resources also need to be mobilized to reach their potential. It may be necessary in such proscesses to take advantage of emerging opportunities in order to mobilize, or to apply other techniques of mobilization and agents of change. To achieve development, it is important that both society and all actors fully use their ability to develop and use their “institutional capital’.

Table 4 on the next page tells us something about the characteristics of such networks and whether they are innovative. The table shows two dimensions. The first is whether a network is closed or open to change from external forces. The second is about the local capacity to handle change, the interplay between the resources in the network (knowledge and relations), and the ability to mobilize these resources to create a team capable of of handling the challenge faced by the business or network.

Some networks are close to external impulses, and will see a path-dependent development. They say “this has nothing to do with us” when they encounter forces of change, or “this is how we have always done this - it is good enough for us.” They will keep doing what they have done, and resist change. These are not innovative networks. Such networks have made their own “path” and keep to that. They either cannot or do not want to leave this path, and have thus become “path-dependent.”

Other networks are open and welcome change. However, due to weaknesses in their institutional capacity, they do not act jointly, so the development will be fragmented. Some will take on change and do something about it, but they do not manage to pull the network into this. The businesses that see opportunities may be especially innovative businesses, and if they do not get the rest of the network to follow, there may be a gap between those who see opportunities and those who do not. This is a sign of weakness in the capacity to handle change and mobilize to joint action. In many cases, however, someone needs to go first and show the way so that others may follow later.

To fit into the description of an innovative network, the network has to be able to take charge and see new opportunities in external forces of change, and adapt these to the local reality and act jointly. In this way the external pressure to change is turned into something positive for the network and possibly also others outside the network.

It is important to add that external forces of change are not necessarily negative but may be seen as an opportunity for desired local development. It is also important to add that institutional capacity is a dynamic characteristic, and even if someone falls into such category today, this may change in the future by working on “building” institutional capacity through a joint project and joint action. Starting small is fine, and keeping an open mind will allow for learning as much from failed actions as from successes.

Table 4. The interplay between institutional capacity and openness to external forces of change in innovative networks

	Weak local capacity (Unbalanced and poorly developed institutional capacity)	**Strong local capacity (Balanced and well-developed institutional capacity)**
Closed networks (Not open to changes as a result of external forces)	Path-dependency: The network is not able to handle the forces of change locally. They follow an existing path: "This is how we have always done this – it is good enough for us".	Inertia: The network is not open to changes as a result of external forces of change. They use their institutional capacity to avoid developing as consequence of external forces ("backwardness").
Open networks (Open to changes as a result of external forces)	Fragmentation: The network has no local environment to handle external forces of change, the network as a unit cannot keep abreast. But there are *innovative individuals and businesses* who see opportunities in the forces of change, and therefore act. They may be able to pull in others in the long run, and get better coordinated action.	Modelling: The network is innovative and has capacity. Knows how to exploit local knowledge to handle external forces of change. Has the ability to model the response in order to fulfil the needs of the network and members, and to lift the whole group.

Case

In figure 6, in the next page, we have plotted our assessment of the ability to handle forces of change for all the four networks studied in the research project VRI2.

The actors in Energy Region are most likely in a path-dependent situation (see figure 6.A., below), or alternatively in a fragmented situation, but they have discovered that something needs to be done. They want to move into a situation where they are able to create local development through the interplay with external challenges and changes. They have not yet been able to mobilize resources in a constructive way, but there is potential. We observed a lack of internal legitimacy in the network, and the network may reach further by improving internal legitimacy. There is also danger that the network's antagonist forces will push the actors into a situation dominated by inertia.

The actors in Jostedalen (figure 6.b., below) are working to coordinate among themselves, and move jointly from a situation which is path-dependent/fragmented, where each and every one developed their own product, towards a situation of mobilizing resources jointly. They have also acquired several "weak" outward ties and build new products based on new knowledge through this. In this way they are able to create local development in interaction with external challenges, so they may draw benefits from these external changes in their own development.

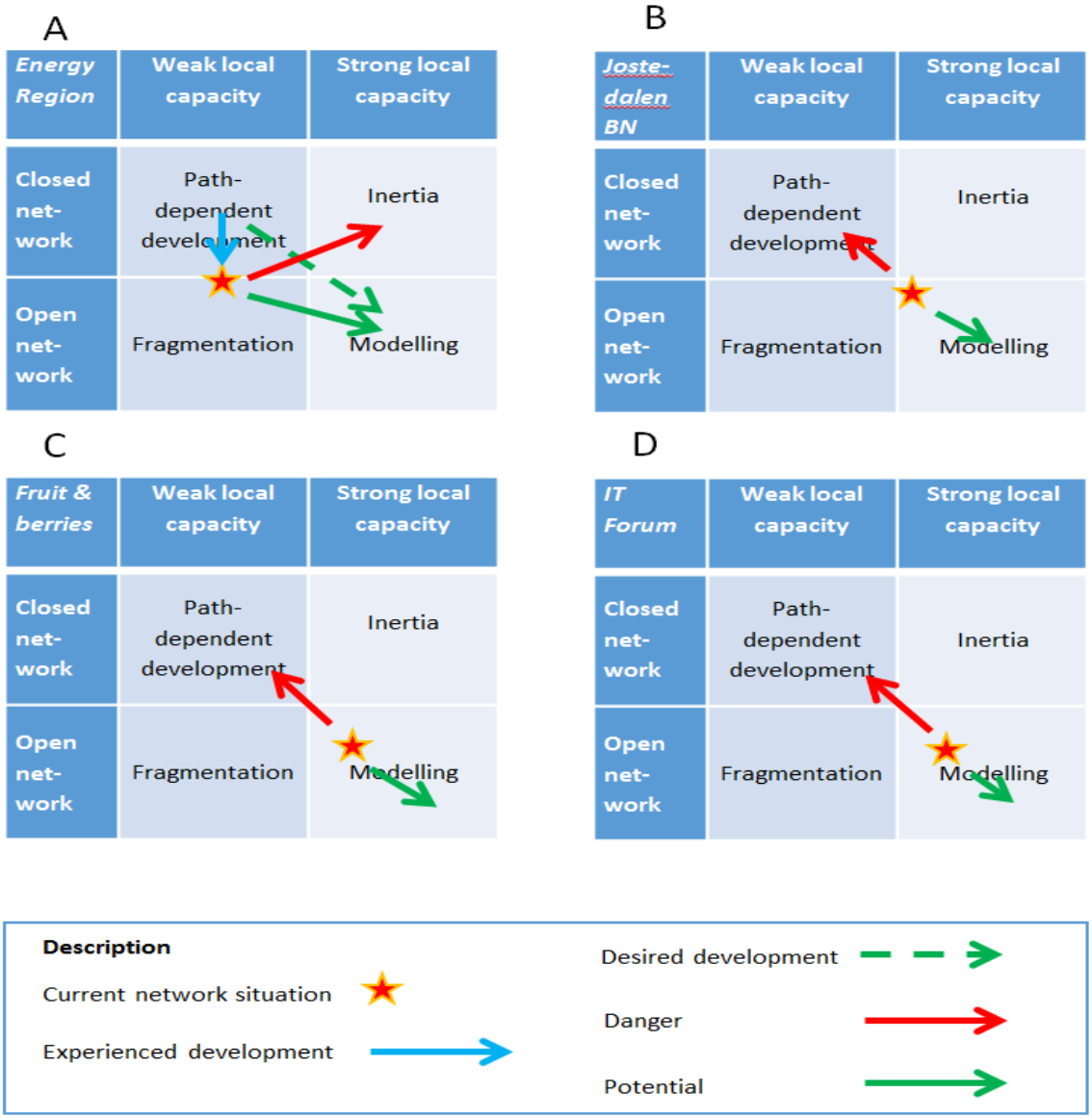

Figure 6. The development of institutional capacity in the networks

The Fruit and Berries Network (figure 6.C., above) has the ability to mobilize internally to meet external threats (e.g. complaints of low quality, poor economy, closure of the research station Bioforsk), and modell this into new ideas and innovation of production and organization. By 2013 they delivered high quality products, which means that the industry now is in good economic shape. The same goes for other network actors that depend on the regional production of fruit and berries by offering services and supplies.

IT Forum (figure 6.D., above) is also able to take on external threats (e.g. poor access to broadband) and is able to create local development in interaction with external changes. This has given broadband access to the region with the same conditions as the rest of the country, and almost at the same time.

These last two networks are now placed in the “ideal route”, but they need to stay attentive all the time with new actions to lift both the network and its environment.

Institutional capacity is a central element in the ability to innovate. This is something that is present in all networks and societies, but which also may be developed over time. In the examples above, we see that change happens over time, both when it comes to institutional capacity and the attitude of networks to external forces of change. A network’s objective should be high institutional capacity and an ability to observe and reflect on external forces of change in order to handle what is relevant and let go of what is irrelevant.

Forces of change – Where do they come from?

We've seen several examples of how external forces of change influence networks and businesses regionally – for example as a result of national action plans.

- In the case of the Fruit and Berries Network, participation in the Arena programme had a positive effect on the network and its activities, as well as on members of the network and processing businesses.
- The broadband initiative of the IT Forum started because they wanted to position themselves better in order to receive state funding to build the broadband connection for the region.

Political and national decisions open up opportunities for action regionally and locally. Nationally, these provide the framework or rules for activities at the local level, which has released for local activity. But this may also be an obstacle to local activity.

- For Energy Region Sogn og Fjordane, pursuing inclusion in the Arena program has been an obstacle to developing other activities. Right after establishing, this network began pursuing acceptance in the Arena program. Since this process took a lot of energy, it took focus away from establishing other activities in the network that could lead to faster establishment of cooperative basis. .

We also found examples of how the regional level influences framework conditions on the national level.

- The broadband initiative taken by IT Forum developed into an active role in relation to national decision-making. As a unifying force from the county, they were able to sway politicians and bureaucrats in Oslo through hearings and national conferences. The sub-network, which was dedicated to the broadband strategy, has been very active and dispatched many hearing recommendations which have influenced national policy and the framework for further broadband strategies. The network is active in lobbying on behalf of their region and others who are in the same situation, and have had many meetings with various ministries. This activity has been visible in the national broadband strategies. They have also taken the role as counselor for the political handling and completion of broadband calls for tender in the county.

Society is no longer merely influenced by local, regional and national forces of change, but also global forces. The problems around broadband access would not have been present unless the international development of Internet technology made it possible to communicate and share knowledge by means of electronic motorways.

Connections to other tools

We have to see this in connection with the strategic tool "What should we pursue?"
Institutional capacity is the sum of the tools, "knowledge development and establishing flow of knowledge", "building networks" and "mobilizing resources", but it also relies on high legitimacy in the network and the ability to "create external benefit".

4. Lifecycle analysis

Why is this important?

The type of phase a network is currently in may influence the strategies that are chosen, but it is also important to pick up signals on the need to change before it is too late. If the network, for instance, has reached a mature phase, one has to be prepared for possible decrease in activity, unless the network is able to restructure.

What is a network lifecycle?

In the marketing literature the product lifecycle is used to illustrate how a product goes through various phases from development to liquidation. Typical phases are development, introduction, growth, maturity and decline/liquidation. Organization research has developed analogies to the product lifecycle which describes both the lifecycle of organizations and industries. This analogy may also be used to describe the network lifecycle, as illustrated in figure 7. The vertical axis shows the intensity of the network collaboration. This intensity may be measured in different ways, all depending on which questions are most relevant. Examples of intensity measures may be the extent of value creation in the network, number of participants at the meeting places, number of members, number of innovations, etc. The horizontal axis is a time scale (age).

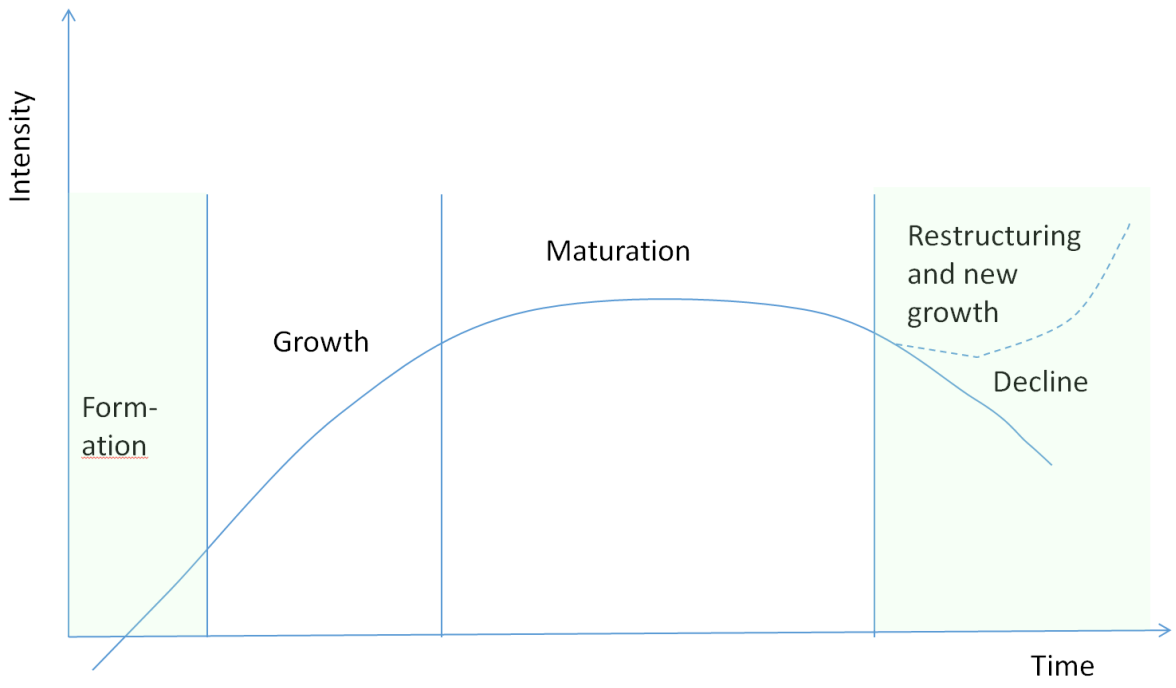

Figure 7 Network lifecycle

Networks may have short and long cycles. Some network will not survive the formative phase, others will not survive the growth phase, and the phase of maturation may be shorter or longer. Recently established networks are in their formative phase, while well-established networks may be in their growth or mature phase. Networks with a long history have typically been able to conclude at least one cycle and have managed to navigate restructuring to find a new focus for collaboration.

How can the tool be used?

The curve in figure 7 shows a possible development process over time, but all networks will not necessarily go through the same development process. Still, this tool is a useful one. We first present a simple exercise to get started:

Exercise 1: Getting started with the Lifecycle tool

1. Try to position the network in question in the figure below

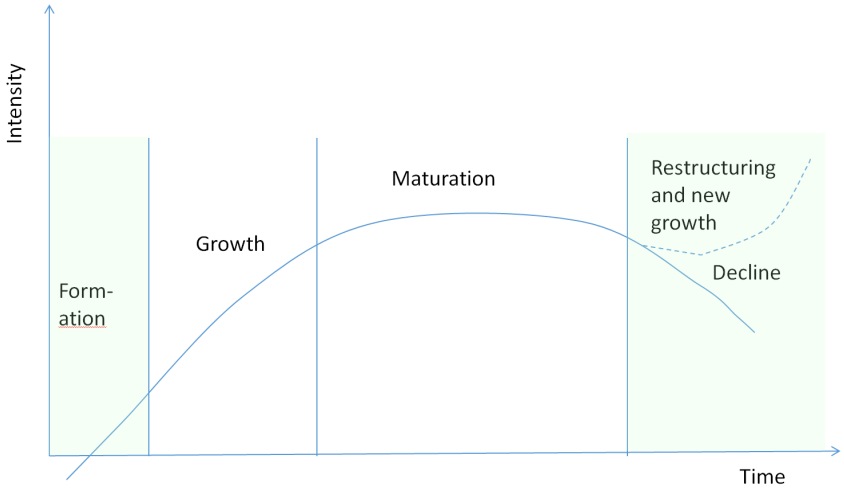

Figure 8. Lifecycle phase

2. What measure of intensity is especially important for you? (Value creation, number of participants in the meeting places, number of members, number of innovations, or something else?)
3. What is the development trend for the selected objective historically over some time? Do you see any signs of danger?
4. Should the network continue? Use the tool “hedgehog concept” to do an assessment.
5. Try to decide on specific values for the objectives based on question 2, thinking 3–5 years ahead.
6. Are you able to prioritize the objectives?
7. What key activities do you think will be added in the next phase in order to reach the objectives?
8. Is there any of the six elements in the tool “functional analysis” you would prioritize above others in the next phase?
9. What should be done by whom in the next phase?

TIPS TO QUESTION 1 - POSITIONING THE NETWORK IN THE CYCLE.

- HOW OLD IS THE NETWORK? (LOW AGE – TREND TOWARDS EARLY PHASE OF LIFECYCLE)
- HAVE ROUTINES FOR INTERACTION IN THE NETWORK BEEN ESTABLISHED? (MATURATION)
- DOES THE NETWORK HAVE ONE OR MORE SPECIFIC OBJECTIVES? (WITHOUT SPECIFIC OBJECTIVES – STILL IN A FORMATIVE PHASE)
- ARE NEW MEMBERS AND NEW ACTIVITIES ADDED CONTINUOUSLY? (GROWTH PHASE)
- IS THE ACTIVITY TAPERING OFF? IS THE SAME NUMBER OF PEOPLE SHOWING UP TO NETWORK MEETINGS? MAY IT BE NECESSARY TO INJECT NEW ENERGY? (RESTRUCTURING NEW GROWTH)
- SEE ALSO THE TOYOTA EXAMPLE BELOW

Exercise 2: Relationship to the public sector – Does the public sector have specific interest in the network? Does the network address areas that are part of the strategic plans in the municipality/county?

- If the network is important for the region's development, the public sector may take on an important role in the formative phase and the restructuring phase, which is illustrated by the shaded areas in figure 6. In rural regions like Sogn og Fjordane, the public sector is an important stakeholder, which may lend weight and dynamism to initiatives, such as in the Toyota example below.
- Among others, Innovation Norway has a program to support the establishment of business networks. The Norwegian Research Council also grants funding to network establishment through its Innovation Project program

Developing knowledge-sharing innovative networks

Each phase is characterized by different activities. Table 5 describes the characteristics of the various phases in the development of a knowledge-intensive network where Toyota was the leading partner and sub-contractor (Dyer & Nobeoka, 2000).

The process is illustrated with a series of figures, see figure 9.

Table 5. The Toyota Network: The characteristics of the different phases

Dimensions	Formation	Growth and maturation
Network Structure	• A large network with leading actor as hub • Bilateral relations with leading actor • Weak ties among most members • Many structural gaps	• Large network and many networks in the network • Multilateral relations • Strong ties in embedded networks and with leading actor • Few structural gaps
Knowledge type	• Explicit knowledge	• Explicit and tacit knowledge
Membership motivation	• Show commitment to the leading actor	• Acquire valuable knowledge, innovation, self-supporting system

After Dyer & Nobeoka (2000).

Figure 9.1 illustrates the starting point as a fragmented group of businesses with little contact between the businesses and no tradition for collaboration. In the formative phase, a central force (figure 9.2), for example a business of some importance, may take the initiative to develop a network.

Initially, market participants often have bilateral relations with the central force but few multilateral contacts. As the network activities get going, multilateral contacts will develop (figure 9.3) and the initiator may decrease their own role in the network and start acting like a network participant on an equal footing.

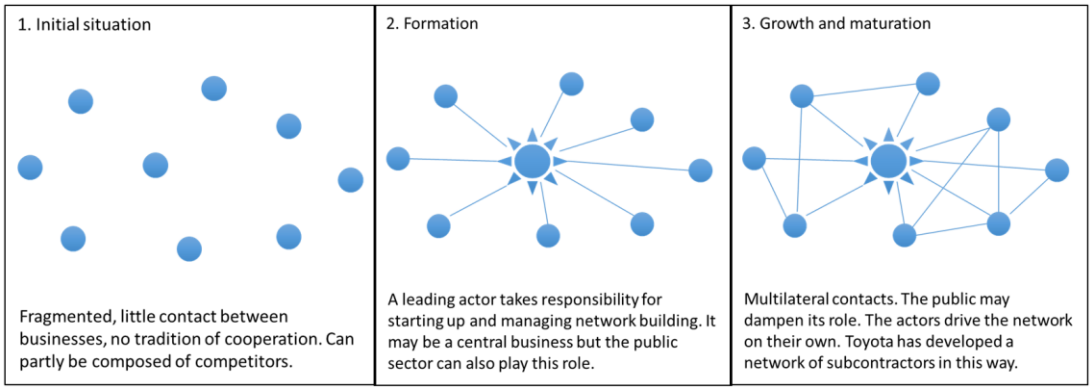

Figure 9. Phases in the development of knowledge-sharing and innovative networks

Case

This project has studied the various networks at different stages of development. Some are in a very early phase; others have been around for years and have gone through the lifecycles several times.

The business network in Jostedalen has a long history. It was established as an informal network, a common interest group, but it did not have innovation or product development as their objective. Receiving an offer to formalize their collaboration by developing a business network made it possible to improve the quality of collaboration. Our assessment is that this network has been through one cycle and that invitation to participate in the business network project helped bring on a new phase of restructuring and new growth. The network is now in a new growth phase where they are testing out different innovations and forms of collaboration.

The IT Forum and the Fruit and Berries Network have been through several cycles of growth, maturity, restructuring and new growth. *IT Forum* has managed to renew, identify new challenges and taken action around these and have thus been through several restructuring and growth phases.

The *Fruit and Berries Network* as well has been through several rounds of growth, maturity, restructuring and new growth. The ability to restructure and identify and take on new challenges is part of the ground work to develop a long-term network collaboration. Both IT Forum and the Fruit and Berries Network are dealing with long-term issues, while other networks may be established as results of a specific need, and when the need is met the network's lifecycle is over. These are typically networks that arise from a project. When the project is completed and the problem solved, the network is put to rest. When a good and productive collaboration between actors has been established and there is a desire to keep the collaboration going, the network may therefore be re-established in a new form and with new objectives.

Connections to other tools

The lifecycle may be combined with other tools. The six elements in the functional analysis may be prioritized differently in different phases. And the tool for building legitimacy may be important to uncover problems in the transition between different phases.

There is no promise that networks live forever, so in some cases disassembling the network is the right thing to do. The hedgehog principle may be a device to figure out if the network is still viable. If there is no desire to disassemble the network, the leaders and participants, especially in mature networks, have to think the situation through: Will restructuring be necessary? Are changes required to achieve new growth?

Chapter 3. Tools for running/maintaining – Functional tools

1. Creating benefits for members

Why is this important?

It is important to focus on membership benefits when the network needs to grow as well as keep its members. Stated differently: How can we motivate target groups to be persistently active members in the network?

What are membership benefits?

Membership benefits are the good reasons to join a network, implying the network needs to provide its members with something the individual members could not do on their own. But there is more to it than that. We must understand that different groups may have different reasons for joining, and that the motivation for membership is something that has to be maintained over a longer time. Following this, there are three important questions connected to membership benefits:

1. What are the **target groups** for network membership?
2. What benefits may the network create for these groups?
3. How may we **maintain** the perceived usefulness over time?

If we are trying to develop innovative networks, three main groups of members will stand out. The first one will clearly be the businesses that are part of the industry or relevant area. In addition, R&D and the public funding system need to be included to ensure a triple helix effect.

The relevant business area may be described as a value chain from several links of subcontractors, then production of goods and services, and then distribution to end users. Parallel to this we can imagine a regulatory sector where we have political authorities and lending institutions. When a network is established, it is important to decide whether the network should include the total value chain or only parts of it. It is possible to imagine a network of subcontractors or a network of businesses which supply the end users. The business network in Jostedalen is an example of the latter, whereas Energy Region Sogn og Fjordane involves the whole value chain. It is crucial for all business managers to know the business area and the whole value chain one is a part of.

When we know what we are aiming for, the next step will be to outline which benefits the network may provide for the different target groups. A common factor is that innovative networks should help to increase value creation among members. We may well say that this is their main purpose. The actual activities that are involved to increase value creation may vary, depending on what group we are looking at. For this reason, the members need secondary objectives in order to reach the main objective.

It is not sufficient to create a short-term interest in networking collaboration and then let everything run into sand. As networks grow and mature, new measures are needed to keep the strength and stamina in the members' commitment.

How do we use the tool "member benefits"?

When we are looking for a target group for the network, drawing an outline of the relevant business area may be useful. A non-specific example is depicted in figure 10 (next page).

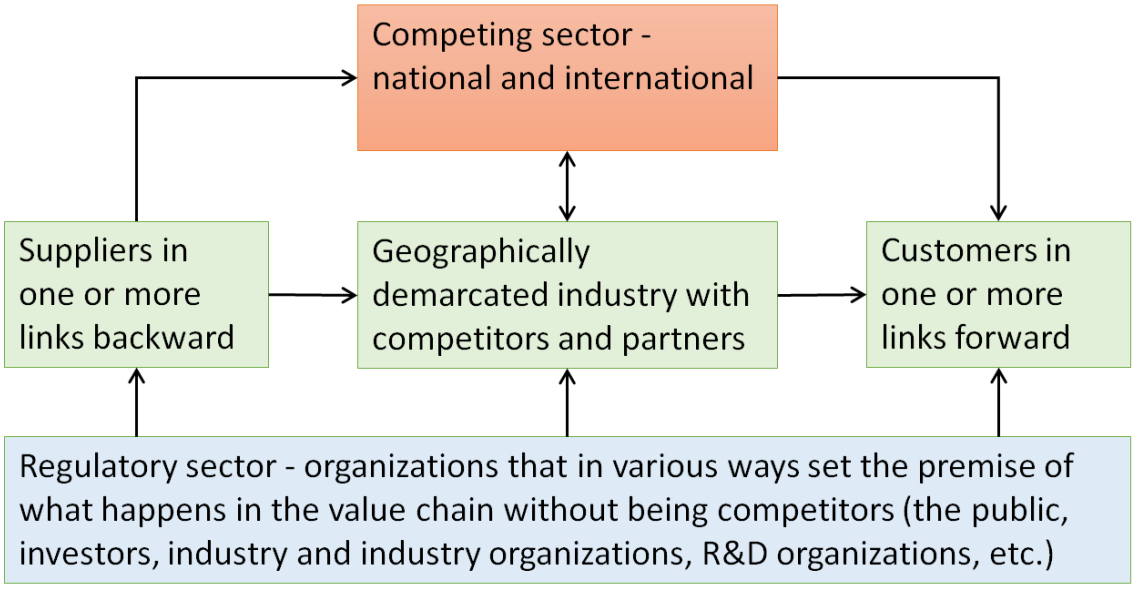

Figure 10. Schematic diagram of a value chain

This is a schematic diagram, and network builders have to strive to make an outline that shows the real situation of the current network. This is exercise number 1 and may be done in several rounds, depending on how complex the value chain is. It also needs to be considered that consultants or researchers may be engaged in this mapping exercise.

Exercise 1: Try to draw up the business area (value chain) the network belongs to.

The next important strategic move is to define the network's boundaries. What should be included naturally? Please notice that it is necessary to include elements from the regulatory sector if we are aiming for a complete triple helix collaboration.

Exercise 2: What would be a sensible limitation of the current network based on the design in our last exercise?

To map which benefits are most relevant for the different groups or actors that are part of the network, we may conduct a so-called contribution-reward analysis. This kind of analysis can be done by listing the most important groups of actors in the left column of a table. The next column describes with what this group contributes in the network, and the third column shows the rewards this group expects from the network collaboration. See table 6 for a non-specific example. Even here is a chance where one will need preparatory work done by consultants or researchers in order to determine the contributions and rewards for the different groups.

Exercise 3: Create a table where the contributions and rewards (benefits) from and to the different actors in the network is shown, based on the results from exercise 2.

In order to determine member rewards we use functions in well-functioning networks stated the VRI2 report. Under the main objective, increased value creation, we may place secondary objectives connected to building legitimacy, innovation, knowledge development and sharing, and resource mobilization. See specific tools for these functions.

The third and last question we have is about how network in their latter growth phase may maintain interest in the network. In practical terms this means the network needs to find new ways of continuously creating value, e.g. constant renewal in the above-mentioned functions.

Exercise 4: How may the current network maintain interest among the members over time, and what does it take for members to prioritise the network? What obstacles are there to members spending time on the network, and how can this be addressed?

Table 6. Example of contributions and rewards analysis

Actor	Contribution	Reward
Owners	Capital, competence	Surplus, dividends, institution building («achieve something»)
Lenders	Capital	Interest, institution building («the bank was involved in this»)
Employees	Employment, expertise	Wages, secure employment, opportunities for development and careers
Suppliers	Goods, services, innovations	Payment, feedback, quality management, communication of needs
Customers	Payment, feedback, quality management, communication of needs	Goods, services, innovations
Competitors	Marketing, innovation, possible partnership	Provides the industry with attractive quality improvements
Interest organizations	Interests regarding management, environment, gender equality, procedures, etc.	Better leadership, environment, etc.
Public sector (state, province, county)	Laws, regulations, capital, expertise, contacts	Tax, employment, local environment, social responsibility
R&D environment	Expertise, research, dissemination	Publication, cases for use in education, competence building

Example - Driving forces for network membership?

A recurring driving force in networks in their formative phase and growth phase is the personal commitment among the representatives for member businesses/actors. Having individuals involved and committed to the development of the field seems to be important to motivate people and actors to participate and move the network collaboration forward.

The driving forces that make it attractive for actors to participate include knowledge about the potential in the field, a desire for more value creation, and for businesses – a desire for contracts. Receiving support from the public sector in the form of services, counselling or financing is also an incentive. The initiators in a network that is in its formative phase express a desire to develop new collaborative relationships between suppliers, and to better integrate the industry value chains in the county. They also are attracted to network collaboration in order to develop new products and services and tackle growing competition from outsiders. In the more established networks we see that members perceive collaboration as useful and awareness of mutual dependency is an incentive to remain engaged. A positive atmosphere and attractive activities organized by the network also appear to stimulate participation.

Commonalities among all studied networks include:

- Personal commitment (enthusiasts)
- Knowledge of the potential for value creation
- Desire to increase value creation
- Desire for better competitive edge
  Offer of support in the form of financing/counselling

Specific elements to networks in their formative phase include:

- Innovation: The desire to develop a supply collaboration/new services and products in order to deliver to new markets, tackle growing competition, and develop/integrate industry value chains in the county.

Networks in their growth phase can be characterized with the following:

- Perceived usefulness
- Awareness of mutual dependency
- Positive atmosphere
- Attractive activities

Barriers to network membership?

An important barrier for actors' participation across all networks is lack of time and capacity to participate in network collaboration. This may lead to some participants choosing to remain outside or only be minimally engaged. For a network in its formative phase, the lack of a functional venue of collaboration, no perceived benefit of the collaboration, or businesses having their own agendas and possibly other collaboration partners and networks, may be barriers to participating in the network.

In a wide-reaching network like IT Forum, one challenge was the disparate backgrounds and interests of the members, which made it difficult to develop project portfolios of interest to everyone, and which could contribute to common objectives. If the members find that the activities are not relevant to them, they may choose to reduce or cut their participation. One challenge to keeping the incentives alive is how the agendas and motivation for participating may be different for the business sector, academia and the public sector. Businesses desire practical project initiatives one can collaborate on – and they want quick results, while R&D and the public sector have longer term strategy and are less focused on practical results appearing quickly.

Commonalities among all studied networks include:

- Lack of time and resources among the many small businesses
- Very disparate backgrounds/interests/motivation: the activities are not interesting to all

Specific elements to networks in their formative phase include:

- Lack of functioning venue of collaboration
- Potential members do not see the benefit
- Other networks/collaborations have priority

Connections to other tools

Creating member benefits should be viewed in connection with other functions, such as building legitimacy, innovation, knowledge development and sharing, and resource mobilization. See specific tools for these functions. From a strategic point of view, creation of member benefits needs to be considered along with the hedgehog concept and lifecycle.

2. Developing knowledge and creating knowledge flow

Why is this important?

This tool may be used to map available knowledge in the network – both tacit and explicit knowledge – as well as knowledge gaps that must be filled in order to reach the objectives of the network.
Producing new knowledge together, and sharing this knowledge, are core activities in a network. Having an overview of available knowledge is therefore necessary for the network to address its tasks.

What is knowledge and knowledge flow?

Knowledge is to know how something works, as opposed to not knowing. This sounds simple, but it may be quite complex from a philosophical point of view. For instance, we do not always know what we don't know, and we do not always know what others know or do not know. But it is not necessary to read Wittgenstein to understand that participation in networks may give the actors new and useful knowledge. Knowledge that is shared may achieve much greater value than knowledge kept to oneself. This does not imply the need to hand over all knowledge, but maybe the need to develop new products through collaboration to achieve more value creation for more participants.

Who has knowledge? Everybody has knowledge, but depending on what kind of work you do, the knowledge will vary. Typically, we distinguish between tacit and explicit knowledge.

- Tacit knowledge – "experience-based knowledge" which is only present in people's heads and therefore is difficult to document. Such knowledge is acquired through doing work, be it different kinds of artisanal work, skills or know-how which may only be transferred through practice. This knowledge vanishes if a person leaves the business.
- Explicit knowledge – "academic knowledge" which can be documented and therefore be found again. This may be transferred readily from sender to recipient. Such knowledge is left in the form of documents, specifications, etc. when a person leaves the business.

Knowledge and flow of knowledge are essential for innovation. No one can be innovative without receiving input. Most innovations happen when stakeholders meet and exchange knowledge. The way in which knowledge flows in the network and among members is vital for the degree of innovation. The network can plan activities that strengthen the flow of knowledge. Let everybody present themselves and their business in order to help securing a platform and be heard at meeting venues.

When working with innovation, adding knowledge from others may distinguish success from failure. A full overview of the knowledge held by various participants may be what enables connecting oneself to the necessary "knowledge resource". The scientific literature frequently describes innovation as an interactive process, that is to say non-linear knowledge development and knowledge transfer: technology and knowledge flow freely between the businesses, research and development, and other stakeholders.

What promotes and inhibits knowledge flow- what promotes active participation in the networks?

There may be many different reasons to participate in the network. In a new study, we extracted some common factors such as building legitimacy and mobilizing social and cultural capital. The actors attribute great importance to these intangible assets, but there is also a need for tangible economic value creation. Due to the variety of reasons for membership, and the fine balance between intangible and tangible assets, managing a network is an exercise which requires engagement and sensitivity (Larsen and Nesse, 2016). There was, for instance, a lack of collaboration projects along the way in the ESF case, where they only pursued one major project that didn't get funding.

How do we use the tool "knowledge and knowledge flow"?

Exercise 1: Map the knowledge present in the network:

- Obtain résumés of the participants participating on behalf of the businesses
- Prepare a business profile for participants in the network, containing both experience-based and documented knowledge

Exercise 2: Classify the actors by the kind of knowledge they may contribute with: scientific, technical, trade/artisanal, general and project-specific knowledge. You may also define your own categories.

Member	Scientific	Analytical	Technical	Trade/artisanal	General knowledge	Project-specific knowledge
Member 1	X	X				X
Member 2			x	x	x	

Exercise 3: Discuss the network's ability to search for and integrate knowledge. Discuss whether the network is open or closed to the influx of new knowledge

Exercise 4: Identify possible knowledge holes in the network. Assess whether other kinds of knowledge are needed in the network and look for actors who may supply this knowledge (see relational resources)

Exercise 5: Consider the following: Could the network strengthen its access to knowledge by engaging with higher education organizations?

- Keep your eyes open to presenting research questions that may be appropriate for bachelor, master and doctoral theses. Keeping in contact with students in higher education (within and outside the county) may facilitate knowledge exchange both ways, and by doing their thesis work, the students may bring important competencies.
- Facilitate training/education for employees through vocational education and training, certificates of apprenticeships, trade school, or anything that will elevate the competencies in businesses.
- Schools and education: Youth enterprises (high school), management training, development of creative abilities, contact with the business sector (providing role models). These are measures that may increase entrepreneurship among young people (girls in particular)
- Be present as role models for youth enterprises. This is important in order to develop entrepreneurship among young people (both genders, but especially important to increase the number of girls). Such contacts between businesses and schools are also important in order to help young people imagine future careers in the county's business community. Young, recently qualified people contribute with new knowledge.

Case

The tourism network in Jostedalen is a relatively small but tight network. The participants know the same people therefore information as well as experience is shared and spread quickly. In the business network, the general manager makes sure everybody is informed about what is happening. Information from meetings and activities individual members have participated in is circulated afterwards in the form of minutes/summaries. In addition, people meet informally, many of them frequently. In this way, tacit knowledge is made explicit to the participants in the network.

Tight networks are often associated with constrictions related to acquiring new knowledge. In tight networks, without many weaker links to actors from other networks, a relatively small amount of new knowledge will be added. It is argued that people in tight networks will have a fairly similar knowledge base and thus little new knowledge is generated. One purpose behind Innovation Norway's business network initiative is to contribute to

sharing experiences with other networks. Knowledge is often transfered via network meetings that is positively perceived by all respondents.

The process of learning to collaborate internally in new ways in Jostedalen was also mentioned as a positive contribution to knowledge generation. By working together more tightly, the businesses are now more aware of which resources each participant in the network may contribute with.

Through their contact with Innovation Norway and the external process manager, the network was given access to knowledge. In this case, the contact is channeled mainly through the project manager, who then will pass it on to the other businesses.

Connections to other tools

Developing knowledge and creating knowledge flow plays a crucial role in building institutional capacity for handling external forces of change. This implies a close connection to several other tools, such as “building networks” and “mobilizing”. This tool is also central when it comes to the tool “What should we pursue”, which, among others, looks at what competencies are present in the network. It is also important with regards to “external benefit”, which, among others, includes the fact that the knowledge flow may exceed the network’s boundaries.

Other tools will help to assess commercial aspects, such as the handbook from Innovation Norway, Weberg Kåsa, C. and Brustad, T. (2009), where one can find and extensive description of market assessments. Norwegian experiences with innovation can be found in “Innovasjon i praksis, veien til den andre siden” (Practical Innovation, the Path to the Other Side) (Dagestad, Sjur (ed.) (2014).

3. Creating innovation

Why is this important?

Innovations are what drives development. Without innovation, businesses would not be able to change the products and services we know today, and would be at risk of losing in competition with others. The Internet is an innovation, mobile phones are an innovation, and self-service shops are an innovation. Where would we be today without these and many other innovations? If we want to achieve value creation in Norwegian businesses and deliver better public services, we still need to innovate.

What is innovation?

Innovation is more than just creativity; it is the whole process from a new idea until this new idea has been put to use. Innovation means implementing something new – introducing new inputs in a process, new products or services, new production processes, approaching new markets, or new forms of organization that contribute to value creation, economic or otherwise, both in the public and private sector (see figure 11).

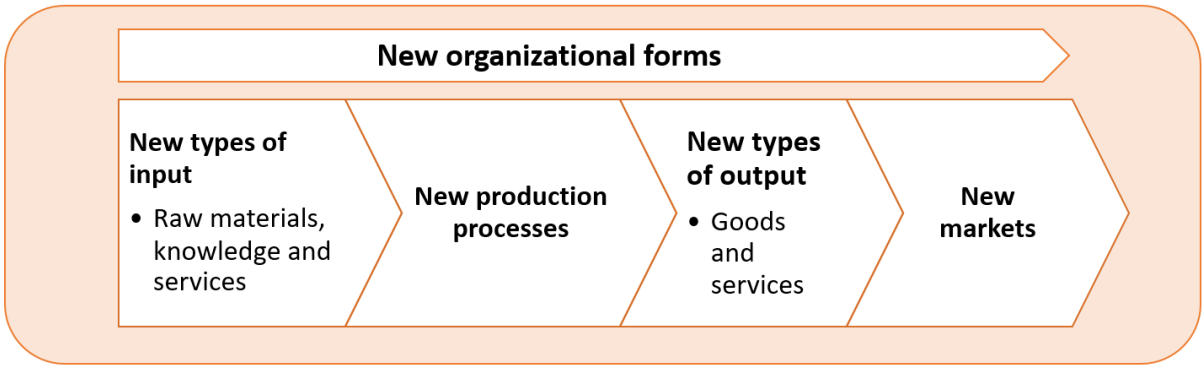

Figure 11. Model for defining innovation based on Schumpeter (1934, 1983)

Schumpeter (1934, 1983) ties innovation both to increased value creation and to qualitative changes. The economic definition of value creation is earnings and personnel costs. Operating income are earnings before

deducting taxes, interest and disposal of surplus. Innovation may be studied within a business, an industry or a network. The value creation in a business, or in a network during a period of time, shows how much money is passed on to stakeholders such as employees, investors, lenders and political authorities (cfr. Jakobsen et al., 2012).

The tool "creating innovation"

A network with a desire to contribute to innovation needs to be aware of activities that will contribute to innovation, both in the network and among the members of the network. It is not always easy to identify innovations. Many businesses solve problems regularly, and is solving a problem really innovation? Yes, frequently it is. Figure 12 shows an innovation process schematically.

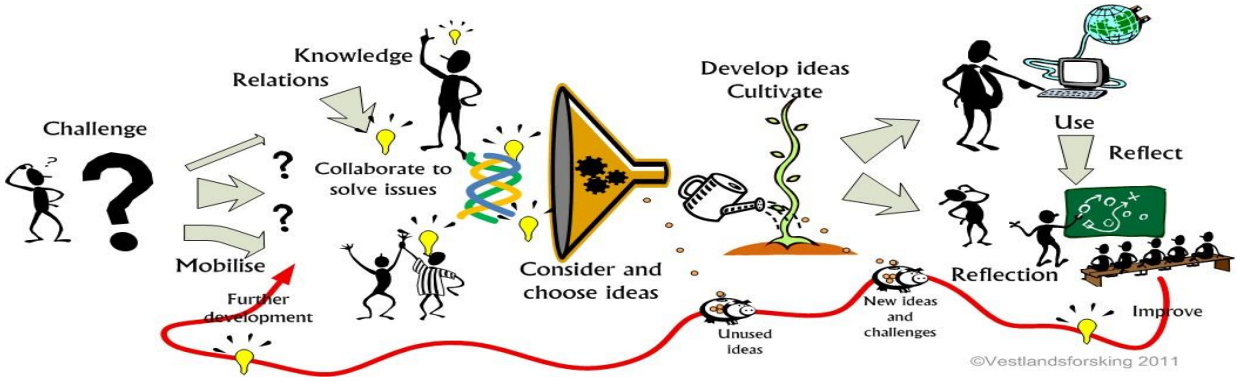

Figure 12. Innovation process schematically, from challenge, involvement of knowledge and relational resources, to mobilization of efforts. Suggestions are assessed, choices are made and tested. Along the way, experience is fed back into the process

The process starts with discovering a challenge. The person or the business may start thinking of how to solve this, and then involves other people that may have knowledge to contribute. These may be people in one's own business or from the business network. The participants discuss and assess and choose a course of action. They develop the solution, start using it and assess the result, and then take the experience back to those who were involved in the discussions to bring the idea even further.

Such an innovative process may occur within a department, within an industry, or within a network. This activity may be part of the daily problem solving in the department or business, or it may be part of larger and more extensive pursuits. Industry-specific innovations are often new ways of doing things, which are made available to all or many businesses in the industry. Network-specific innovations are a result of interaction in the network, either through direct involvement or by ideas being sown in the network.

How do we use the tool "innovation"?

Exercise 1: If you are working with innovations, get an overview of the innovations that have come out of the network. Make a list of improvements that have resulted from collaboration in the network or among individual members of the network.

- Create activities that focus on innovation and what innovation is. Even small innovations are in fact innovations.
- Interview members about the benefits they have had from the other members in the network, and whether this led to innovation.
- Gather information about what the total value creation in the network is and measure this changes over time. Acquire similar information for the industry or other competing networks in order to find out whether there are improvements.
- Make a list of innovations and classify them. You may use a simple form, like the one shown in table 7. It is often important to be aware that innovation really happens as a result of the network existence and the meeting place that represents.

Table 7. Innovation log

NEW FORMS OF ORGANIZATION:			
New effort factors:	New production processes:	New types output/product:	New markets:

Case

If innovation and development is an objective and theme in a network, the focus on this needs to be continuous. This involves identifying challenges that can be solved if several actors join together, and developing new and better solutions. In the five networks we researched, the scope of the innovation processes varies greatly among the network participants. The two companies in the marine sector focus heavily on innovation and continuously experiment with new ways of doing things. The business network in Jostedalen is in the process of developing new products and product packages where different suppliers contribute. They have also been innovative in developing a new business to be managed jointly by the participants, a new form of organization.

With the exception of the fact that Energy Region Sogn og Fjordane is a new way of organizing businesses, the network has not yet become a place for innovation, but the individual actors previously have demonstrated an ability to innovate, and there is thus a basis for further innovative activity. IT Forum is primarily an arena for exchanging knowledge, making contacts and developing ideas, whereas further development and implementation of ideas is performed by smaller groups of members, organized in subgroups. This is a network with a long history, and it has contributed to innovations in the public sector, such as message exchanges between health care institutions, nursing care and general practitioners, as well as organized the efforts of getting broadband to the county.

Within the Fruit and Berries Network, there has been a strong focus on innovation in the past few years, and we find examples of a list of new developments, from effort factors to markets. Figure 13 shows examples of innovation in the fruit and berries industry. Most of these have been developed in collaboration between several actors. This is also reflected in the industry's economy. Figure 14 depicts the sales increase of six major varieties of fruit and berries, compared with three other counties that are important producers. Here we can see how Sogn og Fjordane has caught up and surpassed the other fruit and berry-producing counties.

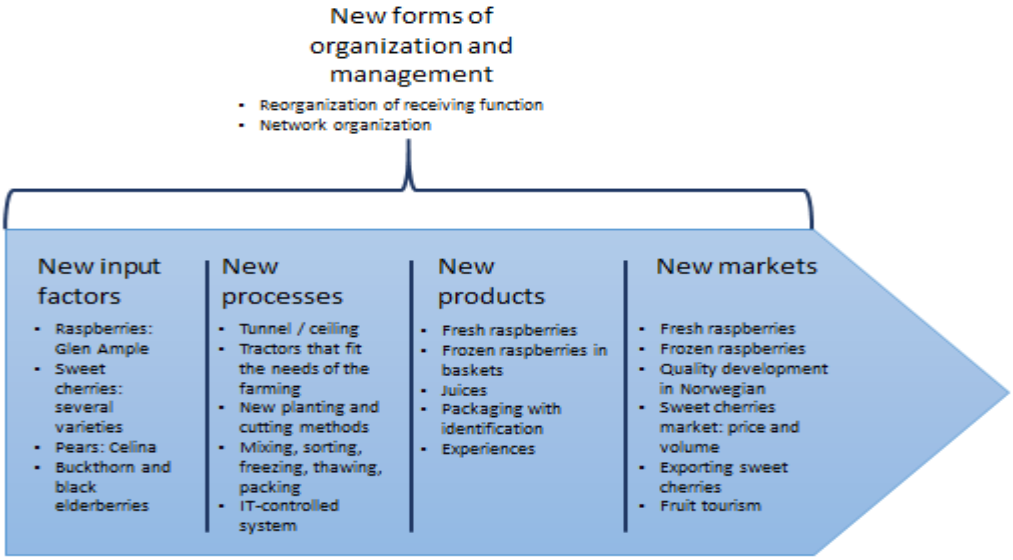

Figure 13. Examples of innovations with fruit and berries in Sogn og Fjordane

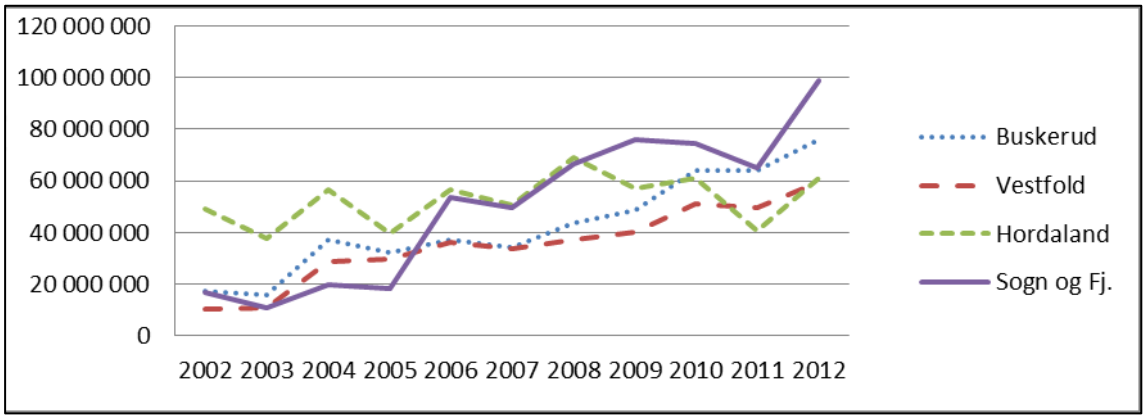

Figure 14. Calculated sales value (NOK) of the six primary varieties of fruit and berries (apples, pears, plums, cherries, strawberries, raspberries) in the four most important counties producing fruit and berries in the country, for the period 2002–2010. Source: Developed by Stein Harald Hjeltnes based on data from SLF and GPS

Connections to other tools

In innovative networks, innovation is the basis for increased value creation and a competitive edge. Thus, all the tools mentioned in the toolbox will in some way or another be connected to creating innovation.

4. Building networks – Relational resources

Why is this important?

This tool may be used to map the participants in the network and the relations between them. This activity is linked with the tool for mapping knowledge.

What is a relational resource?

A “resource” is a source, a reserve or a tool which may be used economically (Norwegian dictionary definition). More generally, a resource is anything that can help you reach your goals. A relational resource is in this context someone you “know” who may contribute to a specific desired development. Here, innovative networks refer to the resources found in the connections between the members and their contacts outside the network.

An important objective of networking is to gain access to more, and often alternative knowledge and competency than what is available individually because innovation frequently occurs when different fields of knowledge meet.

The basic structure of the network can be described in different ways. We will here discuss a few characteristics that can be found in network collaborations.

- Topology: A network may take on many forms, and which form it takes will influence what kind of interaction is possible. Figure 15 on the next page gives an illustration of different topologies. Figure 15.1 shows a chain network – examples of this may be networks built as supplier-customer relationships. Figure 15.2 illustrates a hub or star network, where members are connected through one central coordinator, and almost all interaction happens through this central coordinator, while direct contact between members is lacking. Figure 15.3 shows a many-to-many network in which all members interact with all other members – there is direct contact among the members of the network. Figure 15.4 illustrates a mixture between a star and many-to-many model. Many networks will have a secretariat, a project manager or coordinator who has a certain responsibility, and there is also direct contact between members, but not everyone is in contact with everyone else. Chain and star networks are more vulnerable than the other two types. Redundancy, meaning there is more than one way to find connections between two actors in the network is important for network’s stability. Chain and star networks are therefore vulnerable, whereas many-to-many and the combination models have redundancy – there is more than one path between each member.

- Vulnerability and elasticity are characteristics of the network, which tells us something about how the network deals with change. If the network is elastic, it will be robust and can stand change, and changes may be reversed. If the network is vulnerable, it will be more subject to random errors and accidents, and changes will be difficult to reverse.

- Strong and weak relationships – strong relationships promote local cohesion and closed networks that are not open to others, while weak relationships open up the networks and promote the ability to innovate, mobilize and coordinate action. Compared to closed networks, these are rather able to make new plans and coordinate activities, and they engage more easily with others to obtain external competencies. With regards to regional development, this is a double-edged sword; while it is desirable to promote fellowship and loyalty (strong relationships), it is also desirable to have the ability to mobilize quickly and adopt innovations.

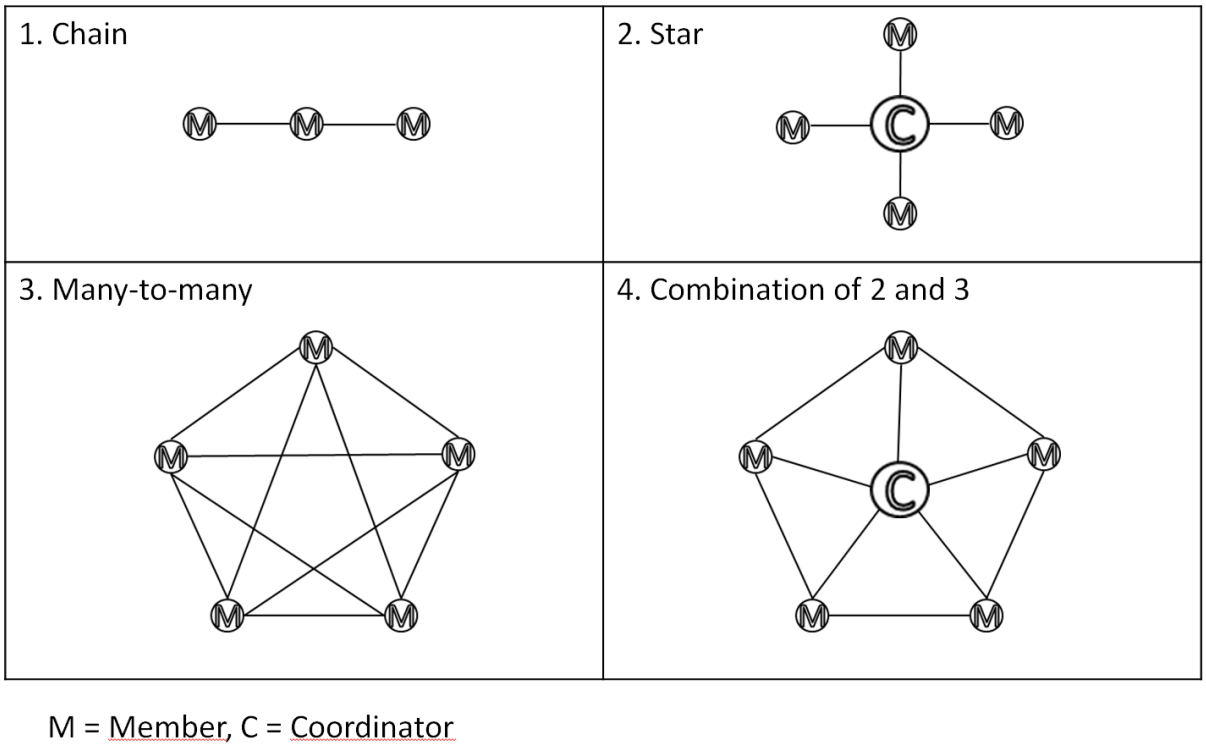

Figure 15. Topology

How do we use the tool "knowledge and knowledge flow"?

Exercise 1: Identify the people in your network and map the members' relationships

- Interview them to find out what relationships they have with other members of the network. Are the relationships strong or weak?
- What other businesses and networks are in contact with outside the network, which may be used when needed to mobilize in order to handle a change?
- How does interaction occur in the network?

Exercise 2: Assess the relationships in the network

- What kind of architecture/topology emerges from the mapping exercise?
- Does the network consist of weak or strong relationships?
- What kind of connection does it have to other networks locally and regionally?
- How is it connected to other local networks?
- What kind of power relations keep the network together? "Power to act" and "power over others"?

Case

IT Forum may serve as an example of establishing and developing a network. IT Forum Sogn og Fjordane was established in 1995 by Jan Per Styve from Vestlandsforsking, and by Oddvar Flæte. the County Governor of Sogn og Fjordane. Several businesses in the county were invited to participate, among these, the County Authority of Sogn og Fjordane, the Public Roads Administration, Sogn og Fjordane University College, and KS. The network was more directed at IT users than IT developers or the IT industry, and this is still the case today, even though it is more common for representatives from the IT industry to be in the network. The network was clearly dominated by the public sector, but the business community became involved early on.

There were many issues to tackle and the network developed their structure early on: a supervisory body, a board of directors, a secretariat and a number of workgroups – frequently connected to projects or the pursuit of various issues.

The supervisory body conducts the long-term strategic work, implements, controls and approves new activities, and the activity is in turn controlled by a strategic plan. The supervisory body annually chooses a management

group of seven persons. The supervisory body establishes and terminates work groups based on strategic choices.

The board of directors is supported by a secretariat from Vestlandsforsking and involves two people. The working groups are involved when most of the specific networking activities occur. These are focused on specific challenges. Subgroups are established when challenges and opportunities arise, and are terminated when the work is done. Some of the work groups that exist/existed are the broadband forum, supplier network, welfare technology, eGovernment, youth and education. By working in this manner, they build the network by identifying relevant issues as well as searching for and involving participants if they are not already in the network.

Connections to other tools

Building networks is a tool that is closely connected to several of the other tools. If the network lacks knowledge in one, it is necessary to “build the network” to make sure the necessary knowledge is available.

5. Mobilizing for action

Why is this important?

Mobilizing for action is an important part of institutional capacity. When a network has decided on an objective, it will not always be possible to act immediately; financing, knowledge resources and similar are needed. It is important to have an overview of funding/financing sources, programs, and political strategies that may bring the initiative forward. This tool may also be used to make strategies for how to mobilize the team leading an initiative, as well as the supporting network. This is the meaning of mobilization (see, among others, figure 3, which illustrates the balance between safe and unsafe).

This tool may be used to identify current and future opportunities, announcements/tenders, political commitments, programs, and funding sources in order to prompt mobilization. Another area where it can be used is in keeping track of funding programs. The tool can also be used to make strategies for how to proceed to mobilize when a new opportunity emerges. It can likewise be used to define who is responsible for what.

What is mobilization?

"Mobilization" involves gathering resources for action. In innovative networks, it implies mobilizing the network members into joint efforts. Mobilizing the network for action is important to get the network going. It entails identifying opportunities (e.g. financing, meeting a need), constraints, and outcomes desired by a primary group of members in order to keep up interest and defining the development processes in the network.

How do we use the tool "mobilizing for action"?

Exercise 1: How to mobilize for action

1. Are there any funding programs that are relevant today?
2. If not, is this something we can lobby for? What funding sources should be lobbied? (Municipalities? Counties? Ministries? Research Council, et al.)
3. Do we have the right people to do lobbying? Who are possible allies (see building networks)
4. Do we see any future opportunities?
5. Are there alternative ways to reach the objective?

Case

The network collaboration connected to the fruit and berries industry has several origins, but we will here discuss three key initiatives: 1) the so-called "Bama project" from 2001 to 2004, 2) program for fruit and vegetables which was launched in 2005 and is ongoing, and 3) arena fruit and berries, which ran from 2010 to 2013. The "Bama project", was in reality titled "Increased value creation in the fruit and vegetable industry in Sogn og Fjordane", in collaboration between Bama, Gartnerhallen, the County Administration, the County Governor, Bioforsk west - Njøs dept., and some producers. The background for the project was the discontent with the quality of fruit and produce from the county, and an awareness that something had to be done for the industry to have a future. In this project, specific objectives were defined in order to increase production of fresh fruit/berries as well as strategies to reach these objectives. When the project period was over, there was a desire to continue the overarching work, and as a result the Program Board for Fruit and Vegetables was established. This board is made up of representatives from the five largest fruit terminals in the county, the County Governor's Agriculture Department and the County Authority. In addition to this, Njøs AS, a company that was established when Bioforsk terminated their department at Njøs, plays a secretary role. The program is a special initiative because it is long-term, in contrast to projects. The program board has as its objective to increase value creation in the fruit and vegetable sector in Sogn og Fjordane. This encompasses both fresh produce and products for the industry. The members of the program board were vital in organizing the last major network pursuit in this area in the county: Arena Fruit and Berries. This project, which received funding through Innovation Norway's Arena program ran from 2010 to 2013, has expanded the network collaboration and created a common meeting place for a long list of actors. The goal is to increase value creation and competitiveness in the fruit and berries segment in Sogn og Fjordane – fruit and berries are thus emphasized.

Connections to other tools

Mobilization in conjunction with "developing knowledge and knowledge flow" and "building networks" forms the basis for "building institutional capacity".

6. Building legitimacy

Why is this important?

Through the tool "building legitimacy", we present a systematic procedure for constructing the network's reputation or legitimacy. This can happen by stimulating positive thoughts in and around the network, kindling commitment among members, and by developing good relations both within the network and to the outside world. Legitimacy is akin to a type of capital that can be built up but which may also be eroded if the actor is not worthy of the trust. As with other capital, it takes a long time to establish a robust reputation, but destroying a good reputation can happen quickly and without mercy. One unfortunate event can do much damage. Establishing and maintaining legitimacy is therefore something that all networks must take seriously.

What is legitimacy?

If an actor (person, organization or network) has legitimacy, this implies that others trust this actor to behave in accordance with accepted values and norms. Possessing legitimacy gives latitude and opportunity to mobilize resources like through loans or transfers of equity.

What is acceptable will vary between cultures and gradually within the same culture. Building legitimacy thus requires the actors in the network to be tuned into the surrounding culture and to know what is going on in every location and every area of interest. The parallel to corporate social responsibility is clear here. Building legitimacy also implies going beyond rather than merely reaching the lowest acceptable level of the surrounding society's expectations.

Whoever creates something new will often face the problem of legitimacy: It is necessary to build trust in the novelty in the surrounding community/society. This novelty may be an organization, a new network or a new product, etc. What we focus especially on here are new networks. Problems with legitimization are often brought on by lack of knowledge about the novelty, or simply because there is no acceptance of this novelty, for instance because it is a break from habitual ways of thinking.

New networks will need legitimacy from all those who are directly or indirectly impacted by the novelty. These can be labelled as "stakeholders". Examples of stakeholders are target groups for membership (businesses, the public sector, research and development institutions), lenders, investors, suppliers and customers.

The tool "building legitimacy"

Here, we present a systematic procedure (a "tool") for those who want to build network's legitimacy. The tool has two dimensions. First, there are different kinds of legitimacy, and second, we may build legitimacy on different societal levels. These two dimensions are illustrated in table 8.

Different kinds of legitimacy (Aldrich & Ruef, 2006):

- Cognitive legitimacy: It involves creating positive attitudes in and around the network. This type of legitimacy may happen "indirectly through learning processes, or more directly by influencing stakeholders.
- Socio-political legitimacy: The focus here is on creating a moral engagement beyond the minimum level suggested by laws and regulation, and in addition developing good relationships to political authorities, for instance in order to influence how laws and regulations are designed.

Table 8. Two dimensions in building legitimacy

	Cognitive legitimacy	Socio-political legitimacy
	Create opportunities for learning and positive associations	Appear serious and add something extra to get a moral engagement
Organization		
Network		
Regionally		
Nationally		

Building legitimacy on various levels:

- Organization: Member organizations support the network through specific actions
- Network: Internal network processes that help integrate
- Regionally: Developing relationships with neighboring networks and other key actors in order to disseminate competence and build alliances
- Nationally: Close contact with institutions for research and education, and political institutions, etc.

More about the various types of legitimacy

Cognitive legitimacy:

- Learning will be initiated in the network, in meetings between the participants, for instance through joint product development. This may in turn facilitate learning for other actors, both other businesses and on different levels in the education system. Customers who receive the new products will have to enter into a learning process. Competitors will likely do the same to avoid falling behind. If something ground-breaking or sensational has been accomplished, one may be contacted by institutions of learning looking for guest lecturers, and the development case may become part of the curriculum. All of this will build legitimacy for those behind the new product.

- When developing cognitive legitimacy, we must elicit positive attitudes about the network, both internally and externally. The goal is that the network should be automatically associated with something positive whenever it is mentioned. We imagine that this over time will become so integrated that it is taken for granted, "'this is how this network is".

Socio-political legitimacy:

- Moral legitimacy is achieved in the network by doing the right things based on what is important to the stakeholders (i.e. contracting authorities, suppliers, lenders and government institutions). Moral actions are characterized by the fact that they exceed the minimum level as defined by legislation. Moral legitimacy may reach a deeper level, as cognitive legitimacy, when it has been present for some time.

- Regulative legitimacy implies that the network builds legitimacy by acting in a serious manner when faced with laws, regulations and political authorities. But it also implies influence to change laws and rules.

In table 8, we illustrate eight different strategies for building legitimacy. All of these will not be equally relevant in all cases. Below we will show a bit more about how the tool may be used.

How do we use the tool "building legitimacy"?

As previously mentioned, table 8 identifies eight possible strategies for building the network's legitimacy. One way to approach this table is to address one column at a time. We will do this through two exercises with a total of four questions:

Exercise 1: How do we develop cognitive legitimacy (See table 9)?

1. How do we establish learning processes in and around the network?
2. How can we elicit positive attitudes to the network among the stakeholders?

Exercise 2: How do we develop socio-political legitimacy (See table 10)?

3. How can we elicit a moral engagement for the network among the stakeholders?
4. How can we develop good government relations?

Table 9. Help to answer questions 1 and 2

	Enable learning in and around the network	**Elicit positive attitudes to the network among the stakeholders**
The individual organization (business)	Develop new knowledge through experiments	Connect what is new to the past by way of symbolic language and behavior ("Grandma Lerum")
Leadership and management of the network, internal processes	Knowledge sharing: Develop deeper knowledge through network meetings focusing on dominant themes	Collaborate on standardization (joint solutions, not separate concepts for each participant)
Relationships to other networks and key actors	Disseminate knowledge through alliances and third party activities	Create groups and federations across industries and networks
Relationships with national/international institutions	Participate in collaboration with institutions of learning and R&D	Collaborate with independent certification bodies

Table 10. Help to answer questions 3 and 4

	Develop moral commitment	**Develop good relationships with political authorities**
The individual organization (business)	Build on existing local networks	Avoid confrontation with public authorities as far as possible
Leadership and management of the network, internal processes	Get noticed and be perceived as a serious and reliable through joint actions	Act as a unit before public authorities (influencing laws and regulations)
Relationships to other networks and key actors	Build a good reputation for the novelty through negotiations and agreements with industries or networks	Try to gain support from public offices against competing networks
Relationships with national/international institutions	Joint (inter)national marketing and lobbying	Invite key people from the public and private sector to participate in the network

Tables 9 and 10 are supposed to be creative tools for participants in networks to allow them to discover how to build legitimacy. We have filled the table with some examples, but each network needs to figure out what their strategies need to be. The most important thing is to decide on strategies one thinks will work, not to fill every space in the table, or worry if a suggestion is placed correctly or incorrectly in the table.

Example of a network with great legitimacy

IT Forum is an example of a network with great legitimacy in Sogn og Fjordane, and also nationally. The legitimacy is based on a relatively high activity, as well as "proximity to a decision-making system". This means that there have been prime movers who also are members of the central member organization in IT Forum, who has made their voice heard by the Norwegian central government.

It is important to note how one of our informants emphasized the responsibility of top management:
"... The success of IT Forum was how the top managers were present during the start-up phase. Now they, many of them, have quit or retired, or this or that, and the new top managers may not have the same connection and therefore things have been delegated, or not even delegated, but at least what has happened is that the colonel and lieutenant levels that have taken over, and I believe this may be a risk, I think that if this should develop, the top managers need to be present".

The development of broadband was moved forward by an IT Forum subgroup, Broadband. This is what gave IT Forum a good reputation and not least created the legitimacy the network enjoys in the in the county, and also in relevant circles nationally. The municipal administrations have also become involved with IT Forum and created stronger ties between the members of IT Forum and the municipalities. One informant expressed: "We wouldn't have had the network in the individual municipalities and with all the actors if IT Forum were not there. It was absolutely vital, simply stated". In table 11 we show how building legitimacy in IT Forum has happened on different levels, for both cognitive legitimacy and socio-political legitimacy.

Table 11. Building legitimacy in IT Forum.

Level	Cognitive legitimacy	Socio-political legitimacy
Business (organization)	• Acquire more than what each member can do on their own	• Build collaborative infrastructure between established organizations
Managing & operating the network (internal learning processes)	• Establish an organization that provides trust • Conducts conferences • Conducts projects	• Active in strategic investments • Proximity to decision-makers
Regional (external learning processes)	• Mentioned as a model by others • Counterforces (challenges centralization trends)	• Define strategic investments in the region • Operator of regional projects
National (external learning processes)	• Arranged national conferences (broadband) • 200 million NOK for broadband • Counterforces - received broadband county-wide • Government jobs	• Taking part in national hearings • Lobbying (broadband, health)

Driving forces for building legitimacy

Several of the industries in which their studied networks are part of, have a long history in the region and are built on unique natural resources. This applies to the marine industry, energy sector, tourism and horticulture. This fact contributes to the legitimacy of the industries and networks. Additionally, there are currently positive social and market trends that appreciate and demand products from these industries, both when it comes to food produced in Norway, activity-based tourism, and renewable energy. Positive media coverage has also been part of building legitimacy to networks in their formative and growth phases.

For networks in their formative phase, the potential for increased value creation and competitiveness in the region is important for their socio-political legitimacy. Sogn og Fjordane Energy Region (ESF) would have been strengthened if their application for the Arena program had been successful. Networks in their growth phase may rely on prior successful projects, prior development and launch of quality product, as well as pre-existing relationships around legitimacy. The fact that customers currently are more interested in the origin of their products has resulted in produce packaging labelled with their origin, and this has strengthened the profile of fruit- and berries producers in the county.

Obstacles to building legitimacy

Both ESF and Marint Vekstforum, which are in their formative phases, encounter a barrier to their legitimacy due to missing many important and relevant actors in the county. Involving important actors would strengthen the legitimacy, both internally in the network and in the area, as well as to external actors. In the ESF network, an internal barrier to legitimacy is found in the lack of a specific project, hence most of the focus has been on the overarching, long-term level. This means that especially smaller businesses, with narrow margins, lose both interest and opportunity to be active. This is probably a dilemma in several networks that involve smaller businesses and organizations in the regions. The activity tourism businesses in Jostedalen pointed out that their perspective was missing from central tourism forums, and this weakens their legitimacy within the wider tourism industry. Networks in their growth phase have fewer challenges to their legitimacy, however, it is still important for these to maintain the legitimacy that has been built. For IT Forum, one challenge is keeping up the activity with projects that are relevant to the whole county, while the Fruit and Berries Network needs to continue the work with a common identity as a fruit and berries county.

Connections to other tools

Building legitimacy has to be seen in connection with strategic tools such as the hedgehog concept, building relationships and lifecycle. It is also closely related to the functional tools membership benefits as well as external benefit.

7. Creating external benefit

Why is this important?

The tool is meant as an aid to identifying possible external benefit of a measure. Such benefit will strengthen the measure by making it possible to indicate usefulness to society beyond making money. This is often a point in applications for public funding. It also improves the network's reputation or **legitimacy**.

What is external benefit?

Economic activity, e.g. in a business, may affect third parties that in no way are connected with this activity. A third party can be both individuals and organizations. Such external effects may be either positive or negative (e.g. pollution). We are here concerned with the positive effects, meaning the opportunity for the network to produce a benefit for someone *outside* the network. This is what we call an external benefit.

An example of external benefit may be that the network trains people who later will have jobs outside the network. The competence will then be of use somewhere different from where it was developed. The network may also acquire an asset to the area, which was not there before and which may be used by third parties. An example of the latter is the development of broadband in Sogn og Fjordane, which happened quite early due to the efforts of IT Forum.

Sometimes freeloaders are a problem. But for the surrounding society, it is positive that the network produces benefits beyond their own members. This is a sign that the network has achieved something others appreciate. General example:

- If you keep your garden well, this increases the value of your house, but it may also increase the price of the houses in your neighborhood.
- Beekeepers collect honey from beehives, in additions the bees guarantee larger and more even crops of fruit and berries nearby, thanks to the bees' pollination.
- R&D can contribute with new technologies that are useful to others in their production.
- Safety: Measures to prevent flood, deployment of fire-fighting equipment.
- Health: Vaccination programs are useful also to those who don't get vaccinated.
- Environmental protection: Improving the environment is a general benefit to the society/community around this activity.
- Education and training will increase the quality of human capital, and may provide external benefits in several ways (higher productivity and competitiveness, safer workplaces, dissemination of knowledge).

How do we use the tool?

The main task here is to answer the question: To which extent does the network develop knowledge and products that are useful to actors who do not belong to the network? Table 12 can contribute in this respect.

Table 12. Questions to uncover possible external benefit

Different areas of external benefit	Our network
If we develop new technology, will it beof use to other producers?	
Are there specific environmental benefits associated with the project?	
Are there specific health benefits associated with the project?	
Is training and learning beneficial for those outside the network?	
If we build new infrastructurewil it be of use to others?	
How will the measure influence the wellbeing in the area/region?	
Will the earnings from the measure stay in the region, or will they be pulled out?	
In what ways will the reputation of the network be improved?	

Case

The business network in Jostedalen: If the network were to succeed in achieving its objectives, the tourism industry in the region, especially Luster, will benefit from more tourists out of season.

If Energy Region (ESF) succeeds, this will pave the way for several companies, including those who are not members, and thus contribute to more value creation locally, which is positive for the demographic development and revenue in other industries. ESF was not there in 2014. But the network could potentially create external benefits in the county; other actors could benefit from ESF.

There are some traits that are common across networks when it comes to external benefit. In the best established networks, we see that knowing each other, and the competency and situation of the other participants will reduce uncertainty and costs of marketing, for example: Analyzing the benefits outside the networks, we see if they contribute to increased value creation in different areas. This is positive both for other actors in the same area and for the region as a whole, for instance through more jobs and a good reputation for the region, which may strengthen the activity in other sectors, such as tourism. In particular, earlier activities in connection with IT Forum can be seen as connected to creation of government jobs in the county. Other specific tangible social benefits that can be mentioned here is the broadband rollout, which came out of the IT Forum's workgroup on broadband, and the knowledge and technology development in the fruit and berries network useful for producers in other regions as well. Within all areas there is much potential to increase external benefit through increased activity, innovation and value creation.

Connections to other tools

External benefit has to be seen in connection with strategic tools such as the hedgehog concept, building relationships and lifecycle. It is also closely related to the functional tool "building legitimacy".

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