Transformative Activities for Smart Specialisation: Considerations on a Workshop Methodology

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Introduction

As highlighted by the EC Communication on Strengthening Innovation in Europe's Regions (European Commission, 2017), globalisation requires regions to tackle the transformation of existing economic structures, *inter alia* by designing and implementing Smart Specialisation Strategies (S3). S3 are a common policy lever at regional level within the EU, while many other countries and regions are getting very interested in designing and implementing S3 – given different socio-economic conditions and levels of development.

The logic of a S3 as a regional innovation policy is to create a framework to get more focus and more coordination among entrepreneurial activities. However, the focus should not be on sectors but on modes of transformation of sectors or of establishing new ones (see *inter alia* Foray *et al*., 2009; Foray *et al.,* 2012; Foray, 2015). We operationalise this focus through the concept of *Transformative Activities* (TA). It denotes neither an individual project nor a sector as a whole, but rather a collection of innovation capacities and actions, that have been "extracted", as it were, from an existing structure or several structures, to which can be added extra-regional capacities and that is oriented towards a certain structural change. As such, a TA can serve as a catalyst for collective action by firms, suppliers and research partners. Based on this definition of TA, designing a smart specialisation strategy means identifying a small number of TA, which will then be developed and supported. This portfolio of activities is managed at regional level and possibly modified as new opportunities for structural change arise.

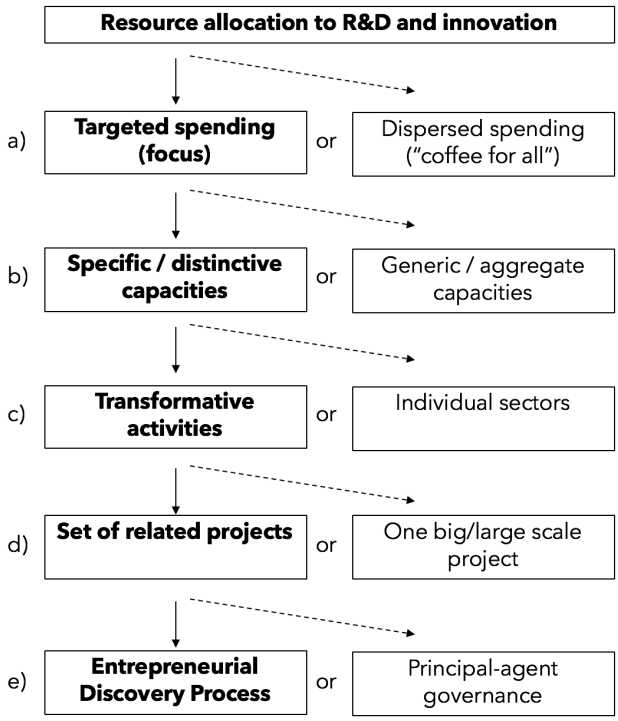
Recent experiences show that the identification and development of Transformative Activities - *i.e.* the innovation capacities and actions that have the potential to lead to structural change - remain a significant challenge in the practical implementation of S3. Current implementation of S3 is indeed often limited to the definition of broad priority areas and lacks the necessary focus on identifying and developing real TA (see Meier zu Köcker *et al*., 2017; Bersier and Keller, 2018). The systematic identification and development of TA is a complex exercise requiring new tools to support the entrepreneurial discovery and action development process.

This methodological paper addresses the challenges in S3 implementation by drafting a workshop methodology for the identification and the development of TA. More specifically, it aims at supporting regional agencies in setting up a process of establishing priorities (identification and selection of TA) and defining action plans for the selected priorities (development of TA).

The S3 framework

S3 provides a framework for regions to become and remain competitive in the global economy by using their limited resources effectively. Regions need to achieve diversification by specialising on a limited number of prioritised economic activities (see Foray *et al.*, 2009; Boschma, 2014). Successful diversification is contingent on exploiting existing related variety (see Breschi *et al.*, 2003; Frenken *et al.*, 2007; Boschma, 2017)[1]. Regions should aim at tapping into opportunities for transformation to meet structural challenges by combining their existing capacities into unique innovative activities (see Foray *et al*, 2012). As a policy framework S3 helps regional agencies to solve the problem of how to allocate public and private resources to R&D and innovation in a regional economy through a sequential process of decisions and actions (see *inter alia* Foray *et al.*, 2009; Foray *et al.,* 2012; Foray, 2015). This process is represented in Figure 1.

Figure 1: The S3 Framework for Resource Allocation in R&D and Innovation



Source: Authors' elaboration.

[1] For an overview of the large body of literature on diversification in regional development see *e.g.* Neffke *et al.*, 2011 and 2018.

Based on Figure 1, it becomes clear that the decisional sequence of the S3 framework to allocate resources is based on a set of principles that are well-established in the innovation policy literature:

a) A principle of targeted spending (focus & priorities) which proves to be more effective than proceeding as usual with dispersed spending and limited targeting – focus and targeted spending allow for realising potential spillovers, scale and scope economies from the constitution of critical mass of projects and actors involved in a common direction for structural transformation (see *e.g.* Enos, 1995).
b) Targets and priorities are not limited to the provision of aggregate/generic capacities but are established on the recognition that innovation in any given field or sector does require specific capacities and coordination devices (see *e.g.* Hausmann and Rodrik, 2006).
c) These targets or priorities are not sectors (sectoral level is not the right level of granularity for any kind of industrial policy) but are modes of transforming sectors or establishing new ones – *i.e.* Transformative Activities (see definition Box 1). The fundamental nature of S3 is not to support existing structures but processes of transformation of these structures (see *e.g.* Foray, 2018).
d) Such a Transformative Activity should not consist of a big and large scale project (likely to become a "white elephant") but of a large number of smaller projects – which are related and coordinated and cover all problems of inputs provision and coordination arising from the development of the Transformative Activity.
e) The paths and modes of development of a Transformative Activity are not planned *ex ante* in a top down manner but are discovered by actors. Entrepreneurial discoveries involve success, failures and surprises and require strong monitoring and flexibility mechanisms (see Coffano and Foray, 2014).

S3 should be understood as a process aimed at transforming the economic structures of a region or any other geographical unit through the formation and development of new activities based on a combination of existing capacities on the one hand and opportunities for structural transformations on the other. In order to precisely denote the target of this process, this methodological paper proposes a novel focus on the concept of Transformative Activities (TA) (see Box 1).

Box 1: Transformative Activities

> **A Transformative Activity (TA)** is neither an individual project nor a sector, but a collection of related innovation capacities and actions, extracted from existing structures, to which extra-regional capacities can be added, and oriented toward a certain direction of change.

Source: Authors' elaboration.

In all cases of Smart Specialisation, the starting point is an existing structure, the transitional path is the formation and development of a TA and the objective is a structural change (for example the modernisation of a traditional sector). TA combine the innovation capacities of groups of companies, suppliers and research partners that are prepared to embark upon some form of collective action in order to transform their capacities. A TA concentrates the necessary actions – R&D projects, partnerships, supply of new specific public goods – to explore the new area of

opportunity and facilitate its implementation in a region. The basic operational mode is not necessarily the collaborative project but the search for coordination and links between the entities and projects concerned, which will facilitate spillovers, economies of variety and scale and the supply of specific public goods and infrastructures to the domain in question. This search for complementarities is not limited to high tech sectors, but should consider resources and capacities from all existing sectors and allow for economy-wide growth in regional economies (see Trajtenberg, 2010; Foray, 2017).

Based on this definition of TA, regional implementation of S3 ultimately consists of two fundamental aspects: on the one hand the identification of the activities through which opportunities for structural change can be tackled, and on the other hand the definition of actions to develop these activities in a given region.

To focus the process on real TA is far from trivial, however. A common challenge in S3 is to avoid defining priorities too broadly and concentrating excessively on already existing regional specialisations, rather than on new opportunities for cross-sectoral combinations and real transformation. If priority areas are too broad, connections, synergies, and spillovers will hardly happen and critical mass will not emerge. Regions also tend to define similar broad priority areas, which hampers the aspired diversification across regions (see Meier zu Köcker *et al*., 2017). The considerations on a workshop methodology outlined in the next section aim at addressing these challenges.

Considerations on a Workshop Methodology

Successful implementation of S3 requires appropriate tools to identify and develop Transformative Activities (TA) based on a reflection about existing capacities and opportunities. We therefore propose a workshop methodology in three phases, focusing on the fundamental aspects in the process of identifying and developing TA. The two main phases (I and II) should be addressed in a dedicated workshop. The particular format and duration of the workshops can vary according to the regional necessities and specificities (see Box 4 in the conclusion). The workshops need to be preceded by a preparation phase (0).

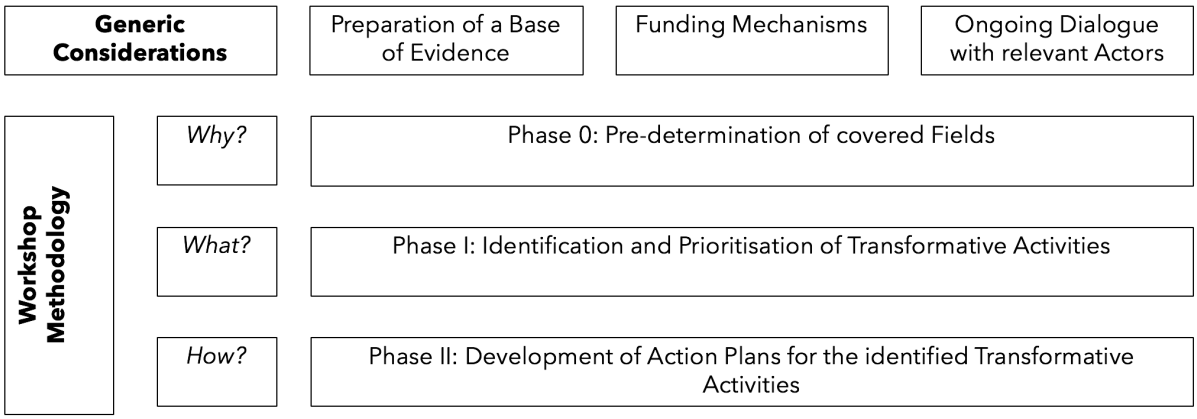
- *Phase 0*: Pre-determination of covered fields
  The phase of pre-definition is to be viewed as a coordination device or a reference point to support discussions and communications among concerned experts and stakeholders about the direction of changes that are desirable to create new positions of the region in the knowledge economy.

- *Phase I:* Identification
  This phase aims at identifying and prioritising new Transformative Activities within the predetermined field.

- *Phase II:* Development
  This phase aims at designing an action plan for the identified Transformative Activities.

Before focusing on aspects specific to the two phases, we briefly discuss some generic considerations on the importance of funding mechanisms, the necessary base of evidence and the relevant actors to be involved in the workshop methodology. Figure 2 summarises the framework.

Figure 2: Workshop Framework



Source: Authors' elaboration.

Generic Considerations

Base of Evidence

The process of identification and development of TA should be an evidence-based exercise. This includes both quantitative data on economic structures, innovation capacities and transformation opportunities as well as more qualitative knowledge about the available entrepreneurial activities and resources in the pre-determined fields. It is recommendable to involve a specialist of the regional economy in the process to prepare the necessary quantitative data. A useful base of evidence would draw on both international benchmarking and regional analysis and include the following elements, if available:

- General international benchmarking (comparing the whole region to competitors):
  Regional performance indicators, Industrial focus, Competitiveness data, Location Quality, Innovative capacities

- Regional analysis:
  Employment per sector / industry, Sectoral location quotients (LQ), Sectoral productivity data, Sectoral exportation data, Sectoral innovation data, Regional cluster portfolio

The development of a base of evidence should be complemented with an analysis of entrepreneurial resources – involving more detailed, qualitative and contextual information that is not necessarily reflected in quantitative data and might require gathering the expertise and knowledge of regional actors. This might include information about:

- Particular dynamisms of regional firms
- Presence of a "champion" in the region (a large company with specific R&D specialisation or specialised research institutes in a regional technical university)
- International linkages of regional players with global "champions"
- Proliferation of start-ups, specific Value Chains, Incubators *etc*.
- Outstanding public-private R&D partnerships

It is crucial to expand the analysis beyond the structural analysis and standard quantitative indicators to allow for a contextual knowledge of available entrepreneurial activities and resources. While the first type of evidence (quantitative) benefits from a thorough preparatory work and can be gathered by a regional expert, the second type of evidence heavily relies on the direct involvement of experts in the pre-determined field as participants in the workshops.

Funding

A second preliminary consideration concerns the involvement of funding bodies in the process. The development of feasible action plans relies on the availability of funding programmes. Phase 2 of the workshop methodology should include a dedicated reflection on appropriate funding schemes and actively involve the relevant programme owners. This implies however, especially in case of public funding, that policymakers are aware of the fundamental logic of Smart Specialisation and understand the necessary focus on TA (in contrast to the widespread "coffee for all" approach). It might therefore be useful to engage in a preliminary policy dialogue and to organise dedicated S3 training sessions and raise the awareness for the necessity of funding schemes specifically targeting the development of TA.

Relevant actors

As noted above, the participants in the workshops should reflect regional innovation capacities and entrepreneurial resources, as well as knowledge and expertise on relevant opportunities in the pre-determined fields. In addition, the set of participants should draw on established interactions between public and private sectors within a framework of a robust and transparent process. There is no magic solution to avoid problems of policy capture through special interest and prevalent influence patterns. In the context of S3, it is crucial to set up an ongoing, decentralised and transparent dialogue on Smart Specialisation in order to detect the relevant actors needed to identify the desired structural changes, the TA that could lead to them and to develop action plans enabling the selected activities to be initiated in a credible manner.

In a nutshell, the identification and development of TA in the proposed workshop methodology should be based on a fruitful interaction between actors from the private sector, the public sector and Government and backed up by evidence and knowledge on existing capacities, opportunities and entrepreneurial activities.

The ongoing S3-dialogue should certainly include the following actors, from which a dozen of experts can be invited as active participants in the workshops, according to the pre-defined fields:

- Academics, notably experts on the regional economy
- Policymakers in charge of S3 and funding schemes
- Representatives of clusters with a comprehensive knowledge of the regional cluster-ecosystem
- Representatives of the regional innovation system
- Experts of tech-transfer with extensive knowledge of the scientific and technological domains covered in the region
- Representatives of key actors from regional companies
- Representatives of concerned citizen groups

Workshop Methodology – Why, What and How?

The pre-determination of fields is about the WHY (*do we select such priority?*). Phase I about the WHAT (*kind of projects?*). Phase II finally deals with the HOW (*to support these projects and the development of the whole TA?*) question.

Workshop Phase 0 - Pre-determination of the covered field

As a preliminary step, the workshop approach requires a careful pre-determination of the field to be covered. It is crucial to define a topic that is comprehensive enough, to allow for a wide range of options in terms of priorities and activities, but not excessively broad, to maximise the potential connections and relations among represented capacities, activities and actors. In other words, the experts in the room need to speak the same language and be able to have a constructive collective discussion on connected propositions. A careful pre-determination allows for a representation of related expertise and competences in the same room. In this sense, the identification and development of TA should be the emerging property of a network of experts with related knowledge and competences reflecting so to speak the related variety – present and future- of a pre-determined part of the regional economy. For that matter, the relatedness between the represented competences and expertise can be based on a variety of different topics, such as sectorial overlaps, related key technologies or common societal or technological challenges.

The crucial element at this stage is that the pre-determination should express and communicate a direction of change. To ensure this, it should not focus on broad sectors as such (or structures) but on modes of transformation of these sectors (or processes to transform structures). The determination of initial priorities should be supported by formal evidence (see above – base of evidence) that sheds light on the importance and regional significance of stimulating a process of structural transformation within a sector or across sectors in the regional economy.

Pre-determined fields identified in phase 0 are typically not particularly region-specific and will, as such, not contribute to the aspired differentiation of regions – for example it would not be surprising to discover that regions such as Brittany, Crete, Galicia and several Scandinavian regions will share a common priority to transform and modernise the maritime and marine resource exploitation. However, the strategy becomes region-specific as these priorities are translated into a set of "related projects". By definition, the projects which will be identified in

Brittany will be different from those identified in Crete, etc. Such a translation is the key process – and requires a carefully designed methodology to involve a group of stakeholders and actors in the concerned domains in the identification of specific projects – as potentially constitutive of a TA (see phase I below). While the selected priority in a pre-determined field can be the same in many regions, a TA aiming at the concrete realisation of the priority will always be region-specific, since its constitutive elements (projects) reflect region specific capacities and opportunities.

Pre-determination of the covered field implies that several workshops should be organised for a regional economy. The priority identification exercise (phase 1) is run for each pre-determined field in parallel. The development of action plans for the identified TA (phase 2) can either be run individually as well, or bundled, depending on whether the identified priorities call for focused or related and overlapping actions.

Workshop Phase 1: Identification of Transformative Activities

The first phase of the workshop methodology aims at identifying and prioritising new TA within a predetermined field. This consist of identifying the set of innovation capacities necessary for the aspired transformation, based on a reflection about existing capacities on the one hand and opportunities represented by new technologies and challenges that can support and drive the process of structural transformation on the other. Novel combinations between capacities/potentials and opportunities are then assessed with respect to their *relatedness*, in order to prioritise a specific set of TA.

In accordance with the pre-determined fields, experts are invited to share their views and observations on:

a) Effective *capacities* and potentials in the region (or any sub-set of the region) and;
b) Specific *opportunities* to change and transform structures

As mentioned above, the discussion and analysis of potentials and capacities should rely on a thorough base of evidence and regional qualitative knowledge and expertise of entrepreneurial activities and resources. The discussion on specific opportunities should examine what kind of new technologies, new business models, new markets or new societal trends have the potential to trigger structural changes in the field (structural changes such as modernisation, diversification, transition or establishment of a new industry). The inputs from the discussion should then be channelled into a systematic prioritisation and identification of a specific set of TA. Specifically, we propose to structure the process through a method involving three steps:

i) Ask the experts to highlight the concrete future projects that are enabled through a combination of existing capacities/potentials with the discussed opportunities for transformation;
ii) Map these projects within the capacities/opportunities framework (see Box 2);
iii) Highlight potential relations among individual projects (as a means to identify potential synergies, spillovers and strong cases for building common infrastructures). The collection of related projects represents the innovation capacities constitutive of a TA (see Box 3).

Assessing existing capacities for a TA includes questioning the availability of human resources, specific skills and competences. It also needs to address the presence of research partners (incl. Universities) in the concerned fields that are responsive to industry problem solving activities) and of firms and entrepreneurs interested and capable to be involved in the project. Finally, it needs to study the availability of specialised services in the field. The discussion of existing capacities needs to include an assessment of critical mass. While the amount of resources needed to effectively boost innovation varies from field to field (see Trajtenberg, 2002), a TA will require a minimum as a basis for successful capacity building in any case (particularly in terms of companies' engagement and capabilities). It has to be noted that the capacity criterion is certainly quite subjective and implies careful discussion and control, evidence-based decisions as well as a strong emphasis on monitoring and flexibility. The assessment of existing capacities and critical mass should also consider the potential of complementary capacities in neighbouring regions, since TA can, per definition, include extra-regional capacities (see Box 1).

Assessing opportunities for a TA means that any project which is selected is defined by the realisation of a technological or business opportunity. Opportunities are typically horizontal in nature (consider *e.g.* an opportunity of the type "digitisation") and related to general purpose technologies (see Bresnahan, 2010). They become operational in the framework of TA when combined with specific capacities. This first phase of the workshop methodology is precisely about identifying the specific capacities that can produce the innovation necessary to seize a specific opportunity – the innovation capacities that constitute a TA. Such a combination of capacities and opportunities would typically result in projects of the type "development of digital applications for tourism", while "digitisation" as such would be a project in which the integration of a new technology into specific capacities remains too vague to be a building block of a TA.

It is critically important to focus the identification of priorities in the workshop on the right level of granularity: The selection of priorities must be carried out not at sector level but at the level of activities that have the potential to transform these sectors or establish new ones. This level – the level of TA – is thus one of intermediate granularity, finer grained than sectors but coarser grained than individual entities. As an example, the level of granularity of identified priorities should not be the footwear industry as a sector, but rather the development of flexible manufacturing technologies for the footwear industry; not the agro-food sector, but the development of nano-applications to increase quality in agro-food; not the energy sector, but the development of smart materials for renewable energy; etc. This intermediate level of aggregation is required for a proper identification of TA. If the discussion focuses on too broad levels of granularity, the identified concrete projects will lack connectivity and relatedness and not allow the identification of a collection of related capacities that form a TA with the intended scale, scope, and spillover effects.

Once a core of projects has been qualified as meeting the capacity/opportunity criteria, their relatedness needs to be evaluated (see Box 3). The following questions are useful to guide this process:

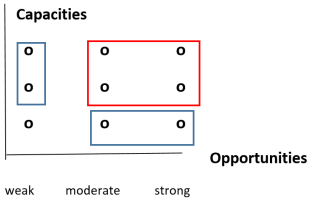
- Do the projects share similar critical inputs (such as *e.g.* specialised skills)?
- Do they share the search for similar new business models?
- Do they involve a connection to the same (or similar) research partners?
- Could they use a common platform of specialised services?
- Are these projects complementary?

Relatedness among projects allows to predict synergies and spillovers - that is to say the formation of a coherent Transformative Activity - and is therefore a good predictor of project performance and success. Note that projects which are, taken individually, weak in terms of capacities or opportunities, might be included in a Transformative Activity if related to the core of projects.

In a nutshell, the first phase of the workshop consists of assessing existing *capacities* and *opportunities* and evaluating the *relatedness* of projects well located in this capacity/opportunity space. This process results in the selection of a Transformative Activity (or multiple thereof) consisting of a set of projects based on related innovation capacities.

Box 2: Mapping Projects

Mapping Projects



Note: The table is highly stylised. The goal is to generate a table with as many projects as possibly – several being located in the same areas (*i.e.* a given node in the stylised table typically represents several projects)

- Projects are evaluated (weak/moderate/strong) with respect to existing capacities and opportunities for transformation

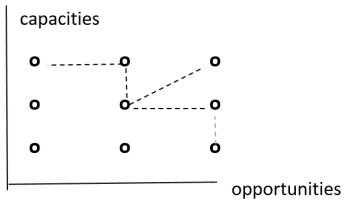
- Based on this mapping four classes of projects are identified:
  - Projects with moderate to strong capacities and moderate to strong opportunities are considered as regional priorities (red)
  - Projects with strong opportunities but weak/moderate capacities should be considered as priorities for inter-regional cooperation (to "import" missing capacities) (blue)
  - Projects with strong capacities but weak opportunities should be considered as priorities for re-allocating critical assets (strong capacities) to meet stronger opportunities (blue)
  - Projects with weak capacities and weak opportunities are eliminated

- Projects that are not eliminated (red and blue) will be considered as constitutive of a Transformative Activity if and only if they manifest relatedness (Box 3)

Source: Authors' elaboration.

Box 3: Identifying Transformative Activities

Identifying Transformative Activities



In the table, four projects with high regional potential (in terms of capacities and opportunities) plus one as a priority for inter-regional cooperation and one as a priority for reallocation of assets are found to be related (*e.g.* in terms of technologies, markets, similarities of some critical inputs, *etc.*). They can be described as related innovation capacities and constitute a Transformative Activity.

Source: Authors' elaboration.

Workshop Phase 2: Development of Transformative Activities

The second phase aims at designing an action plan to develop the identified TA in a given region. More specifically, this implies to concretise the identified priorities in terms of actions, policy programmes (including funding) and interventions. As specified above (see Box 1), a TA is defined as a *collection of related innovation capacities and actions oriented toward a certain direction of change*. In consequence, the second phase of the workshop methodology is dedicated to concretise the actions necessary to implement the projects of related innovation capacities identified in the first phase of the workshop.

Developing and ultimately establishing a TA in a region requires building and gaining critical mass (capacity building). This can involve a wide range of actions, such as the identification of missing critical inputs which need to be privately or publicly provided (specific training, research, infrastructure), the development of coordination devices (such as platforms or networks) to connect firms, suppliers, buyers, technology and research, the support of R&D projects, the inclusion of potential adopters of the innovation through training, integration of novel management practices or adoption of new technologies, the implementation of monitoring instruments and last but not least the governance structure to guide and lead the TA.

The development of action plans for the identified TA are by nature dependent on the projects of related innovation capacities identified in the first phase of the process (Workshop Phase I), which in turn depends on the pre-determined fields. The nature of the necessary actions will vary depending on the outcome of the previous steps. As noted previously, identified priorities may call for very specific and focused actions. They may however also point to actions relevant for different fields and allow bundling the second phase of the workshops with the outcomes of the workshops on other pre-determined fields.

Let us take the following example to illustrate the idea in spite of its varying concretisations. Based on a robust process of public-private interactions, and analysis of existing capacities and opportunities (phase 1), the following TA has been identified as a priority: "New composite materials, business models and markets for SMEs in the ceramic industry"[2]. The second phase now aims at elaborating an action plan to build up this TA with the identified related innovation capacities and effectively tap into the aspired opportunities for transformation. This typically involves the identification of gaps in the new ecosystem. What are the missing capacities and capabilities in composite materials and how can these gaps be addressed? It will also involve promoting R&D and other innovation projects that support ceramic SME's move towards new materials technologies and markets. It will aim at making use of and strengthening the identified relational density – increasing the number of ongoing related projects at the intersection of the ceramic industry and new composite materials, generating potential synergies and spillovers and creating a strong case for common research and service infrastructures in the field. Last but not least, it will involve the design of monitoring mechanisms (benchmark and indicators) and of mechanisms to ensure feedback and flexibility.

Conclusion

While S3 has reached the status of a common policy tool at the EU level and beyond, recent experiences show that development and implementation are far from trivial. This working paper addresses this challenge by operationalising S3 implementation through a novel focus on the concept of Transformative Activities (TA). TA are defined as a *collection of related innovation capacities and actions, extracted from existing structures and oriented toward a certain direction of change*. The systematic identification and development of these activities is a complex exercise requiring new tools to support the entrepreneurial discovery and action development process.

In response, we draft a workshop methodology for the identification and development of TA, addressing important challenges for designing and deploying S3 in any regional economy as a tool to enhance focus and coordination among entrepreneurial activities. The workshop methodology includes generic considerations on funding mechanisms, the necessary base of evidence and the relevant actors to be involved in the process. The process as such is structured in three phases: pre-determination of covered fields (Phase 0), identification and prioritisation of TA (Phase I) and development of action plans for the identified TA (Phase II). In order to focus the workshops and allow the practical organisation of the workshops, the fields to be covered need to be pre-determined in a preliminary phase. The first phase of the workshop then consists of assessing existing *capacities* and *opportunities* and evaluating the *relatedness* of projects representing a strong combination of capacities and opportunities. This process results in the selection of a TA (or multiple thereof) consisting of a set of projects based on *related innovation capacities*. The second phase is dedicated to concretise the *actions* necessary to implement the projects of related innovation capacities identified in the first phase of the workshop in a given region.

[2] Note again that this is a priority at the required intermediate level of granularity for Transformative Activities – not a sector but a process to transform a sector.

The considerations on a workshop methodology presented in this paper have been paralleled by the author's practical experience with S3 development and implementation in workshops across Europe. While different practical formats have been applied to implement the workshop methodology, we provide an archetype schedule and a list of necessary resources for a concentrated workshop session covering two pre-determined fields in Box 4.

Box 4: Practical Workshop Format

Entrepreneurial Discovery and Action Development Workshops

Schedule

Day 0:

- Pre-determination of fields

Day 1:

- Introduction to S3 and discussion (2 hours)
- 3 parallel workshops (3 hours):
  - Identification of TA in pre-determined field I
  - Identification of TA in pre-determined field II
  - Special session for funding agencies

Day 2:

- 2 parallel workshops or 1 bundled workshop (4 hours):
  - Development of action plans for the identified TA
- Conclusion (1 hour)

Necessary Resources

About 10 to 12 experts for each pre-determined field – reflecting industry, research, entrepreneurial activities, concerned (citizens) groups and public agencies.

One moderator/facilitator for each parallel workshop.

A solid base of evidence (quantitative documentation about capacities and opportunities for innovation) for each of the pre-determined fields.

Source: Authors' elaboration.

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