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How societies learn and build competencies

Have you ever wondered why some companies, industries or even places appear to be more able to innovate and harness new knowledge, while others are lagging or stagnant?

Being innovative involves the ability to combine existing knowledge in new ways as well as to combine existing knowledge with newly gained knowledge. As the general sophistication of technologies in an industry or place grows, the ability of any organisation to have all the relevant knowledge in-house is diminishing. As a result, knowledge is increasingly being spread out among a larger number of

actors, who need to interact dynamically to create new products, processes, services, organisations, markets and enabling institutions, that is, to learn and innovate. This means that it is becoming harder and harder for individual firms to innovate and more and more necessary for diverse actors to work together effectively.

We developed an analytical framework to capture these dynamics based on the most salient characteristics of dynamic innovation systems. The framework consists of seven lines of enquiry that practitioners can use to design a diagnostic or exploratory process without having to understand the whole theory of innovation systems. This framework offers a multi-dimensional perspective on the incentives agents in an innovation system face when learning about new ideas, technologies and opportunities.

Here is a short summary of the seven lines of enquiry.

1. The competitive pressure and productive structure at the level of firms, sectors, locations or technologies

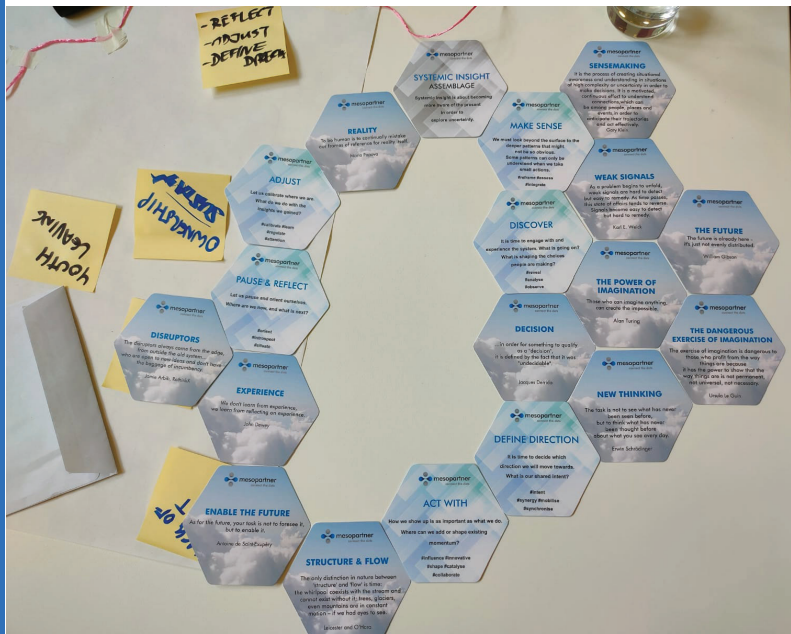
A large part of imitating, innovating, learning and problem-solving occurs where companies and individuals transact, compete and collaborate. A diagnostic process must therefore consider the networks that firms are part of (such as a value chain, cluster or locational network), the characteristics of the key technologies in different firms, and the leading firms' strategies to develop the networks they form part of. Assessing the productive structure also calls for exploring the inner workings of companies, how physical and social technologies are arranged, and how technologies are changing these social arrangements.

2. The ability and performance of the education system to upgrade formal knowledge systems

This line of enquiry looks at the formal public and private education institutions and how effectively they equip or prepare society to absorb and master formal knowledge. It looks at the diversity of education and skills development options and the education system's effectiveness in responding to change. The education system plays an important role in shaping the starting conditions from where individuals and organisations solve problems. It provides the technological language used to solve problems, explore abstract ideas and cooperate with others.

3. The depth and diversity of organisations that disseminate technological knowledge

Firms depend on various public or private organisations to disseminate technological knowledge that enables them to solve problems, innovate, compete and grow. These organisations lower the barriers of access to scarce expertise and expensive equipment or provide services tailored to the competence of companies.
A diagnostic process must therefore map and assess the gaps between the supply of technological services from these organisations and the changing needs of the businesses in the innovation system.



4. The framework conditions that incentivise learning, innovation and risk-taking

Firms' innovation efforts are not usually driven purely by enthusiasm for innovation alone, but also by the outcome of necessity – firms must innovate because their competitors are innovating too, and because they will lose their market share if they do not innovate. As a result, firms that are experiencing little competitive pressure will often not be inclined to put much effort into innovation. The framework conditions that incentivise firms to innovate are created by the broader macroeconomic, regulatory, political, environmental and social conditions. These framework conditions define the incentives that firms face and the risks that entrepreneurs, investors and public officials must manage.

5. Dynamism and interaction between different agents in an innovation system, and between the innovation system and the broader environment

This line of enquiry is about how the different agents collaborate, share information, adapt to new knowledge and make collective decisions. Companies and their supporting institutions typically co-evolve, just like physical and social technologies co-evolve. Innovation systems also co-evolve with the broader socio-economic and technological environment. Hence this line of enquiry is about describing whether and how learning and innovation between different agents, knowledge domains and institutions happen. It is about understanding how aware different actors are of the effects of their decisions on other parts of the system, and whether and how people intentionally work together to improve the system's overall health. It is also about how information flows and how different actors adapt their behaviour based on what they learn from others.

6. Poorly articulated needs, capabilities and opportunities in the system

In economies undergoing large structural adjustments, there is typically a lack of reliable data on how the economy is changing, where new markets and competencies are emerging, and where there is a need to strengthen or create new institutional capabilities. When there is a lot of uncertainty, companies generally cling to proven technologies and markets, even if they are outdated.

There are two sub-areas to explore in this line of enquiry.

- The first concerns identifying coordination failures around pressing issues that could be used to stimulate innovation and new networks.
- The second sub-area concerns investigating some of the information asymmetries that exist between different actors in the innovation system.

7. The ability of the innovation system to foster and support the emergence of alternative innovation arrangements and development pathways

Many companies are innovating in a slow and ongoing incremental process, with some disruptions along the way. The supporting institutions may respond to the industry's clearly articulated needs and may anticipate future requirements along a specific path or trajectory. While this linear process has advantages, there are also disadvantages such as path dependency, lock-in or the marginalisation of segments of society. Moreover, dominant technological arrangements or widely shared world views could make it hard for actors to imagine or contemplate alternative technical arrangements and pathways. In many cases, these alternative arrangements already exist but lack sufficient scale or support. At worst, alternative ways of doing things might even be blocked by stakeholders or regulators. Determining whether such dynamics exist is the aim of this line of enquiry.

In the last year, we have successfully used the seven lines of enquiry to conduct a market analysis of the ICT and agrifood systems in Moldova. In South Africa, we diagnosed the innovation systems in the clothing and textiles, leather and related goods and also the plastics manufacturing sectors. The framework helped us to shift the attention of stakeholders from patents and physical technologies towards how people are learning, how institutions are adapting and where coordination gaps and systemiac failures are stubbornly persisting.

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