



## THE CONCEPT OF SMART SPECIALISATION AS AN INNOVATION MANAGEMENT INSTRUMENT IN LIGHT OF POLISH AND AUSTRIAN EXPERIENCE

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**Abstract:** This paper presents theoretical assumptions of the concept of smart specialisation and complementary theories of regional development in the aspect of innovation management. The strategy of smart specialisation, which involves the processes of creating a vision of regional development, setting strategic priorities, and searching for competitive advantages to maximise knowledge-based potential, highlights at the same time the necessity for regions to become specialised due to their differences, which constitute their strengths and allow them to stand out, and stresses the importance of strengths increasing regional innovativeness, which allows overall economic growth to be achieved. As smart specialisation relies on the identification of areas in which a region may demonstrate specific resources that are difficult to copy in other regions, the paper presents the Polish and Austrian experience. The paper has a review character and is an attempt to systematise knowledge about smart specialisation at the regional level.

**Keywords:** smart specialisation, innovation management, Silesian Voivodeship, Upper Austria

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### Introduction

The concept of smart specialisation is a result of the works by the Expert Group *Knowledge for Growth*, established in 2005 as a consultative body by Research Commissioner J. Potočník. The assumptions of the idea of regional specialisation, whose co-author was D. P. Foray, among others, were presented in 2008 in the working documents of the above mentioned consultative body (Szostak 2015, p. 209-217) and in a report containing recommendations on the functioning of the European Research Area (Markowska, Strahl 2016, p. 118-129) in the context of the increasing importance of the processes of globalisation, agglomeration and networking. Between 2009 and 2011, the issue of smart specialisation dominated the scientific and political discussions of the international forum: the Organisation for Economic Co-operation and Development (OECD) (Pleśniarska 2016, p. 209-225) and the Joint Research Centre (JRC) of the European Union.

The concept was disseminated mainly thanks to the Communication from the European Commission Europe 2020: Strategy for intelligent and sustainable development facilitating social inclusion (Prusek 2015, p. 11-18). Smart

specialisation is closely connected with the main priority of the programme Europe 2020 – intelligent growth, i.e., development of the economy based on knowledge and innovation (Szostak 2015, p. 209-217), and its leading project, Innovation Union, which obliges member states to modify their regional innovation strategies (RIS), with special reference to the development of a vision of regional growth, setting strategic priorities, identifying competitive advantages of the different regions and using intelligent policies to maximise their knowledge-based endogenous potential (Gasz 2015, p. 317-326).

The aim of the paper is to discuss the assumptions of smart specialisation and to present its theoretical bases with respect to innovation management in light of the Polish and Austrian experience.

### **The concept of smart specialisation in the aspect of innovation management**

Smart specialisation is a concept of defining a strategy for innovations and a tool used to define and maintain the current and future position of a region or country in the knowledge-based economy (Nowakowska 2015, p. 310-318).

The basic requirements and assumptions of the idea of *smart specialisation* include:

1. Creation of an area of research and innovation that is large enough to enable competition between numerous rivals. An example of such an area is the *European Research Area* (ERA), which is an integrated, transnational area that enables mobility of resources, such as a free flow of knowledge and a more effective use of economies of scale and spillover effects, and reduces structural barriers to competitiveness (Wolniak 2016, p. 407-419).
2. Concentration of activities on those areas of science and innovativeness that are complementary to resources of a given region and strengthen its comparative advantages. It is also important that regions do not aspire to the position of a leader in the same scientific fields, areas of innovativeness or economic sectors as most of them fail to implement their objectives due to a lack of the appropriate critical mass, economies of scale and range. Smart specialisation requires that connections be created between research and development, human capital development and specific economic conditions of regions and countries. The consequence of *smart specialisation* should be increased differentiation between the European Union's regions in the area of scientific, technological and economic specialisation (Nowakowska 2016, p. 56-66).
3. Creation of so-called general purpose technologies (GPTs) (Hotz-Hart, Rohner, 2014a, p. 1-24) that can fulfil the role of enabling technologies that facilitate economic growth (Cremer 2014, p. 253-265). Currently, the concept of GPTs has been replaced by the concept of key enabling technologies (KET) (Hotz-Hart, Rohner 2014b, p. 295-320).
4. The implementation of smart specialisation that takes place as part of *entrepreneurial learning process* aimed at identifying scientific areas, technologies and industrial branches that determine the competitive advantage

of a specific region on the European and global scale (Nowacki 2014, p. 14-21).

The attribute of entrepreneurship that accompanies the identification of *smart specialisation* does not mean, however, that entrepreneurs are the only group involved in this activity. The strategy of smart specialisation is not defined in a top-down fashion by public administrative bodies or external advisers. Therefore, domestic and regional administrations fulfil a significant role in its implementation, which involves (Harfst, Wirth 2014, p. 463-475):

- concentrating various partners around the formulation of a strategy and adjusting public aid to specialisation areas;
- analysing public aid;
- defining complementary investments to the emerging specialisation;
- undertaking promotional activities connected with networking as part of general purpose technologies between various partners.

In the conditions of globalisation and increasing competitiveness, we can see a growing role of the knowledge-based economy that is able to create and implement various types of innovations (Skowron-Grabowska, Sukiennik 2015, p. 1046-1051; Brzozowska, Szymczyk 2017, p. 377-387). Innovation management is thus of increasing importance for social and economic development, both on the global and local scales. At the same time, it is often connected with high risk and the necessity to use significant knowledge and financial resources, which constitutes a barrier to the increase in innovativeness of enterprises (particularly small and medium ones) (Jelonek 2016, p. 57-66). The elimination of this barrier and recognition of innovations as growth determinants causes practically all developed countries across the world to use certain models of innovation management (Kościelniak, Skowron-Grabowska, Nowodziński 2017, p. 14), applying methods and instruments for supporting innovations. They may impact various spheres, areas and entities of the social and economic system, particularly enterprises and scientific and research facilities. As the need to support innovations is indisputable, it is necessary to rationally choose the method for managing innovations in the aspect of their effectiveness. At the level of a region, an important aspect of managing innovations is RSI (regional strategies of innovations), and the driving force behind their implementation is the concept of smart specialisation.

Smart specialisation is a concept and a tool for innovation management, used to define and build the current and future position of a region or country in the knowledge-based economy (Knop, Szczepaniak, Olko 2014, p. 239-253). In the case of regional development, smart specialisation is based on the relationships among science, the public sphere, education and business. In the context of such relationships, the main condition for the development of smart specialisations of a region is to use its potential through the best possible adjustment of the directions of scientific development and education to its social and economic specificity.

Enterprises are the main entities in the model of RSI implementation. This strategy is mainly addressed to them - they are its beneficiaries. At the same time, what is very important is the effective implementation of the innovation strategy

that depends on the behaviour of enterprises and appropriate management of innovations. Management of innovations is an enterprise's ability to develop innovative projects, absorb innovations and apply and disseminate them. Appropriate management of innovations is an attribute of an enterprise that allows it to compete in a situation when its competitive advantage is based on innovations (Stabryła 2015, p. 169-178).

Enterprises' chances for increases in innovativeness connected with effective management of innovations in the aspect of the development of smart specialisations result from:

- the possibility of conducting business activity as part of a specific specialisation using attributes of this specialisation that enable increased capability of creating and absorbing innovations;
- the use of and participation in projects, programmes, undertakings and operational activities implemented as part of RSI, connected with the development of smart specialisations.

Smart specialisation as a concept inscribed in the aspect of innovation management assumes that no country or region is a leader in all areas of science and innovativeness (Kriegesmann, Kerka 2014, p. 73-87). However, each of them has a certain potential that allows it to achieve competitive advantage in a specific area. A practical manifestation of smart specialisations that facilitate such development is a new approach to innovation management in the aspect of creation and definition of objectives in regional strategies of innovations (Seroka-Stolka, Nowakowska-Grunt 2012, p. 206-211). The idea of this approach focuses on optimal use of the potential of the different regions and definition of the directions of their development that are consistent with their specific conditions, i.e., there is a match in the triangle: science – education – economy.

### **Smart specialisations under Polish conditions**

The process of identifying smart specialisations in the different regions of Poland has not been completed. The selection of the priority areas identified so far has been based on the assessment of endogenous resources of voivodeships and on social consultations. The different regions relied on, among other things, foresight, industry analyses, technology mapping, expert panels, workshops with entrepreneurs and the scientific sector, and measurements of maturity of cluster structures (*Badanie potencjałów ...*, 2013). According to the results of studies conducted as part of the workshop project Smart specialisation of a region - methods, indicators, tools, the identification of smart specialisation was based, among other things, on assessment of infrastructure and resources, review of networks of institutional, cluster relationships between institutions of the business environment, external expert recommendations, methodology recommended by Platform 3s and analysis of value chains. The factors considered during the identification of specialisations also included innovativeness of SME, technological innovations, human capital, possibilities of industry transformation

and modernisation, social challenges, diversification potential, niche areas and non-technological innovations (Gawlikowska-Hueckel, Szlachta (red.) 2014).

Silesia is one of the first regions in Poland that joined the platform of smart specialisation of regions. Works on the strategy for the development of the Silesian Voivodeship are conducted by the councilmen of Silesian Voivodeship sejmik, the voivodeship executive board, the Steering Committee for updating the development strategy for the Silesian Voivodeship for the years 2000-2020, the Moderator of the process of updating the development strategy and a Team for the implementation and monitoring of the development strategy for the Silesian Voivodeship for the years 2000-2020 (*Model wdrożeniowy ...*, 2013).

Priorities set by those managing the Silesian Voivodeship include significance for the development of the voivodeship and the potential of a specific industry or area. The list of key technological areas includes eight industries: medical technologies, technologies for the power industry, mining and environmental protection, information and telecommunications technologies, production and processing of materials, transportation and transport infrastructure, mechanical engineering, the automotive, aviation, and mining industries, nano-technologies and nano-materials (*Regionalna Strategia Innowacji ...*, 2012).

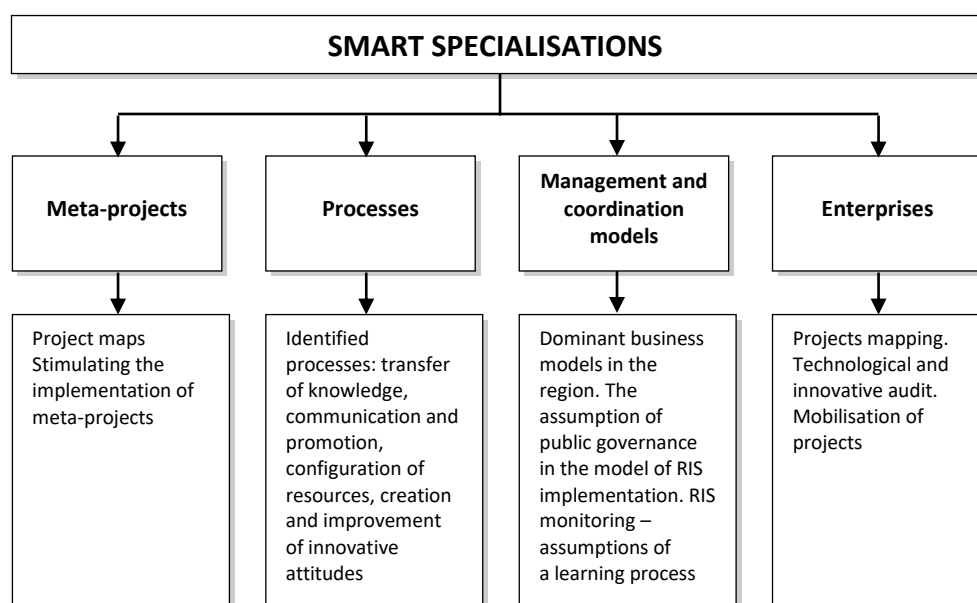
For the Silesian Voivodeship, the Regional Strategy for Innovations of the Silesian Voivodeship for the years 2013-2020 has been developed, which is the second document of this type in the region. The first innovation strategy was implemented between 2003 and 2012. The importance of strategic studies is connected with the effective achievement of objectives and the possibility of implementing strategic initiatives in a broad sense, which is closely related to the implementation of the RSI model and its essential components, i.e., smart specialisations. It is the growth potential of smart specialisations, which results from the use of scientific and research potential of the region, and the preferences in its financing that determine the capability of implementing the objectives of RSI and thus the effectiveness of its implementation. Studies were conducted as part of a system project implemented by the Silesian Marshall's Office in Katowice (*Regionalna Strategia Innowacji ...*, 2012). The subject of project studies and works were methods, instruments and ways of application of the RSI approved for the voivodeship. The model of implementing the Regional Strategy of Innovations developed for the Silesian Voivodeship for the years 2013-2020 is largely based on the development of smart specialisations, which, for the region discussed are the power industry, medicine (in a broad sense) and information and communication technologies.

The idea that guided the development of the RSI for the Silesian Voivodeship was the transformation of the existing regional system of innovations into an ecosystem of innovations – a multi-level system that looks for new solutions and areas and smart specialisations that distinguish the region and build its competitive potential. An ecosystem of innovations is able to configure and use regional resources as well as obtain global resources for the development of smart specialisations and achievement of objectives that determine the development of innovations in the Silesian region (*Zarządzanie, wdrażanie ...*, 2013). In this

context, the regional ecosystem of innovations of the Silesian Voivodeship was developed based on five strategic areas:

- common knowledge and innovations;
- network of public services;
- infrastructure of the regional ecosystem of innovations;
- SME in global economy chains;
- talents and competences.

However, the implementation of the Regional Strategy of Innovations, treated as a complex, socially and economically multifaceted project, required selection of proper methods and instruments as well as means of its implementation, presented in a specific model, which was implemented based on the creation and development of smart specialisations in the region. The main elements of the model of RIS implementation were smart specialisations, meta-projects, processes, actors and a management and coordination model, as presented in *Figure 1*.



**Figure 1. Model of implementing RIS in Silesian Region**

Source: (Regionalna Strategia Innowacji ..., 2012)

It should be stressed that processes in a broad sense, which are implemented by means of projects that are appropriately selected for the creation of innovations, constitute very important elements of the implementation of RIS. An in-depth analysis of the structure and configuration of the ecosystem of innovations of the Silesian Voivodeship, as well as the conditions of the implementation of the Regional Innovation Strategy, enabled the identification of the main processes that allow its objectives to be implemented. They include (*Wyzwania strategiczne ...*, 2010):

- transfer of knowledge;
- configuration of resources;
- communication;
- creation and improvement of innovative attitudes.

As has already been stressed in the case of the RSI of the Silesian Voivodeship, smart specialisations constitute its fundamental components. The selection of smart specialisations in the Silesian Voivodeship was based on the following conditions (*Regionalny Program Operacyjny ...*, 2013):

1. Necessity of identifying unique characteristics and assets of the region used to build competitive advantages;
2. Activity and concentration of regional partners and resources around the vision focused on the achievement of a higher level of prosperity;
3. Development and strengthening of regional innovation systems;
4. Maximisation of knowledge flows and dissemination of the benefits of innovations across the entire regional economy.

In light of the above-mentioned aspects, it should be stressed that smart specialisation requires cooperation between companies, research institutions, universities and local authorities to identify the most promising areas of specialisation, as well as weaknesses and barriers that hamper the implementation of innovations in the region. The selected smart specialisations of the region, i.e., the power industry, medicine and information and communication technology, closely correspond with the priorities and strategic areas of the RSI and, most importantly, are connected with the strategic objectives. The proper selection of the projects of smart specialisations and their effective implementation determine the effectiveness of the implementation of the RSI in the Silesian Voivodeship.

### **The concept of smart specialisation using Upper Austria as an example**

While many countries and regions are still developing their strategies of smart specialisation and defining priority areas, the region of Upper Austria is already systematically implementing this concept. Upper Austria is a region whose authorities took decisive actions aimed at the development of innovations and technologies, as well as the creation of the Regional Innovation Strategy. The main aim was to change the direction of creating the system for supporting innovations. This aim constituted the response to the needs of the scientific, political and economic circles of the region. In the long-term, the aim of actions to be undertaken and the Regional Innovation Strategy was to create an effective system for supporting innovations that would make Upper Austria the leading region in Europe. The Regional Innovation Strategy included the following detailed objectives:

- strengthening cooperation between companies and technology suppliers in the area of innovations;
- intensification of research and development activity;

- increasing the commercial use of the results of research and development activity;
- promoting innovations and awareness building.

It is worth highlighting the fact that in the region of Upper Austria, a comprehensive economic and research strategy containing elements of the concept of *smart specialisation* has been used (Keuschnigg 2014). It should also be stressed that Upper Austria has an advantage over other regions in that it is characterised by a large number of technological clusters, appropriate universities and technological networks in strategic sectors, which constitute the basis for implementing this concept. The strategic framework of the policies used for the operation of local authorities of Upper Austria was based on two programmes: “Regional Competitiveness Upper Austria 2007-2013 Program” and “Innovative Upper Austria 2010 plus”, which was approved in 2010 and continued until 2013. Both these programmes were meticulously updated to include issues connected with the concept of *smart specialisation*. While choosing the priorities in the area of specialisations, it was decided that megatrends and large global achievements in research and development, the so-called *big global R & D topics* (nanotechnology, biotechnology or genetic engineering), should not be copied uncritically; instead, the focus should be mainly on regional resources. The areas of specialisation were divided into two categories: the first of them included the assets occurring in the region and research sectors constituting the so-called double strength and referring to such areas as mechatronics and process automation, innovative materials and information and communication technologies. The second category included targeted sectors of the economy, the so-called prospective sectors, such as *life science* and logistics or sources of renewable energy. Management structures were defined as bottom-up, stressing the significance of continuous interactions occurring between local authorities and entities operating in the area of innovations (Granig, Hartlieb, Lercher 2014).

It should be stressed that since 1998, Upper Austria has been pursuing a policy aimed at the development of strong economic and technological links between enterprises and research and development institutions by supporting clusters, competence centres and networks. As a result of undertaken activities, eight cluster initiatives in different industries of the economy were established in the region of Upper Austria, namely, automotive industry, plastics, furniture, food products, eco-energy, health, mechatronics and technologies connected with environmental protection. Moreover, the support covered four inter-industry networks operating in the area of human resources, logistics, media and effective use of energy (Pechlaner, Reuter (Hrsg.) 2014).

In the definition of the policy at the regional level, financial instruments were also used to help to create optimal frameworks for the functioning of clusters with reference to the creation of networks, promotion of clusters, consultancy, skills upgrading, establishing cooperation and transfer of technology. In this context, the financing of cluster-oriented innovative projects has clearly become part of the implementation of a strategy of *smart specialisation* (Dujmovits 2015, p. 29).



However, we cannot ignore the fact that the region of Upper Austria shows the characteristics of the *triple helix* structure, in which all entities that are important from the perspective of innovations, i.e., public authorities, universities and research facilities, and business, are connected not only by formal but also by informal links. The system created in Upper Austria is positively perceived due to not only the set of well-developed clusters but also to implemented formal procedures that allow all entities involved in the development of innovations to unite by formulating a coherent, strategic programme with a set of appropriate instruments for its implementation. It is also worth highlighting the fact that in 2011, a holding *Upper Austrian Innovation Holding GmbH* was established in Upper Austria to integrate activities of all educational institutions in the region, research facilities and agencies promoting the economy of the region and innovations to increase the effectiveness of activities in the area of innovations (Schneidewind 2013, p. 117).

The process of building the Regional Innovation System of Upper Austria, as a direct result of the implementation of a large number of initiatives, is based on the experience and potential of a large group of institutions and enterprises in the region. At the same time, the construction of the system of innovations shows that these institutions are linked by webs of mutual task-based dependence, which is directly connected with the implementation of defined initiatives. We should thus stress that the implementation of actions as part of an innovation system requires cooperation at the level of institutions in the region, country, and in numerous cases - also at the international level. As a consequence, the list of the participants of the RIS of Upper Austria includes a range of other institutions and is constantly becoming longer.

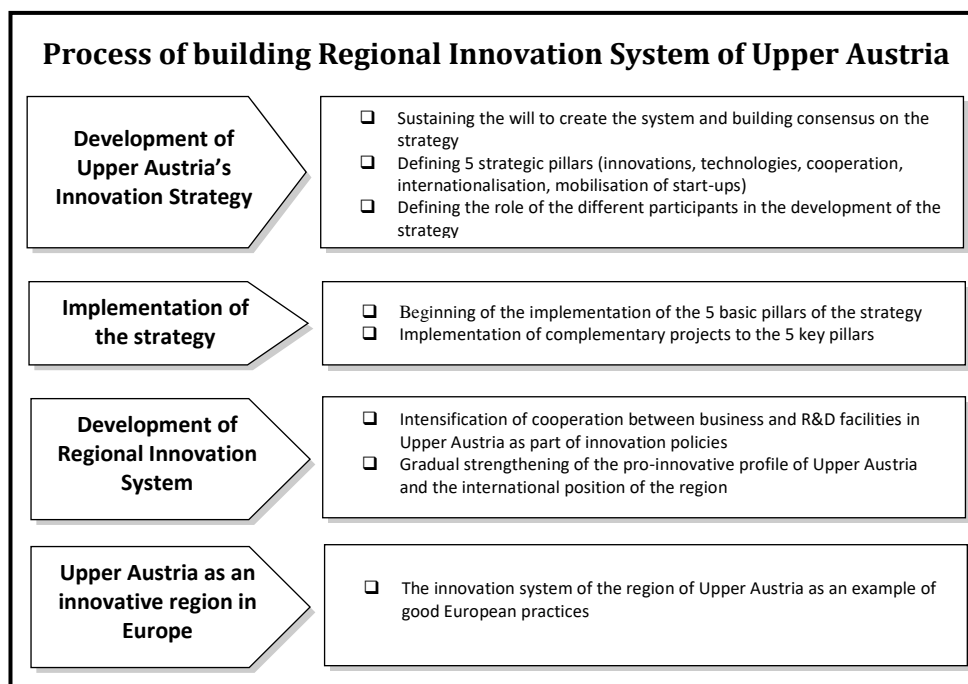
An important characteristic of the RIS of Upper Austria is its functionality, which enables visible market effects to be achieved through the process of verifying success factors and effective management of innovations in the region.

The methodology for assessing the RIS of Upper Austria uses a comprehensive system of tools for monitoring and assessing an innovation policy pursued by this region. The aim of the system is to collect data on the results of innovation-supporting activities designed to improve implementation instruments, justify the disbursed amounts and popularise successful initiatives undertaken as part of the strategy.

Moreover, the RIS defined the following main aims:

- strengthening cooperation between companies and technology suppliers in the area of innovations;
- intensifying the research and development activity;
- increasing the commercial use of the results of research and development activity;
- promoting innovations and awareness-building.

With the development of the Regional Innovation Strategy of Upper Austria, a scheme, which is presented in *Figure 2*, was defined for building a system for supporting innovations in the region, which included innovations, technologies, cooperation, internationalisation, and mobilisation of start-ups.



**Figure 2. Scheme was defined for building a system for supporting innovations in the region of Upper Austria**

Source: Own work based on (Schneidewind 2013, p. 117)

The aim of the RIS in the region of Upper Austria was to look for new mechanisms of support that are the result of more advanced needs of enterprises, defined on the basis of successes achieved in the process of innovation. The substantive scope covered the entire process of creating innovations, starting with gathering information about innovations, through accompanying companies in initiating innovation activity and professional expert support to create conditions for effective international cooperation between regional companies.

## Conclusions

In the 21st century, the low competitiveness of the economy and deepening distance with respect to the world economic powers has become a key problem. These issues have become the basis for criticising the existing innovation policy and searching for new ways, tools and trajectory of development. The response to these challenges is the concept of smart regional specialisations proposed along with a new vision of EU development in the strategy Europe 2020. Smart specialisation is a new paradigm of the management of innovations in the aspect of their competitiveness. It is, at the same time, a new way of shaping a regional

innovation policy designed to eliminate existing barriers and failures in building innovation capacities of regions.

The concept of smart specialisation, presented in the light of the Polish and Austrian experience, is both the idea of creating innovation capacities of regions and a tool for managing innovations by building a unique competitive position of regions at the international arena. It is based on simple, even obvious assumptions. However, it requires difficult and complementary actions, starting with the identification of territorial resources and technological advantages, through identification of actually functioning networks, and ending with the selection of specialisation domains and definition of a comprehensive and individualised regional policy.

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## **KONCEPCJA SMART ORGANISATION JAKO INSTRUMENT ZARZĄDZANIA INNOWACJAMI W ŚWIETLE DOŚWIADCZEŃ POLSKICH I AUSTRIACKICH**

**Streszczenie:** Niniejszy artykuł prezentuje założenia teoretyczne koncepcji smart specialisation oraz komplementarne wobec niej teorie rozwoju regionalnego w aspekcie zarządzania innowacjami. Strategia inteligentnej specjalizacji, obejmując procesy kształtowania wizji rozwoju regionalnego, ustalania priorytetów strategicznych, poszukiwania przewag konkurencyjnych w celu zmaksymalizowania potencjału opartego na wiedzy, akcentuje jednocześnie konieczność wyspecjalizowania się regionów ze względu na ich odmienność, która stanowi o ich sile i możliwości wyróżnienia się, oraz podkreśla znaczenie mocnych stron zwiększających innowacyjność regionalną, umożliwiającą osiągnięcie ogólnego wzrostu gospodarczego. Ponieważ istotą inteligentnej specjalizacji jest wskazanie obszarów, w przypadku których region może wykazać się specyficznymi zasobami, trudnymi do naśladowania w innych regionach, w artykule zaprezentowano doświadczenia polskie oraz austriackie. Artykuł ma charakter przeglądowy i stanowi próbę usystematyzowania wiedzy dotyczącej inteligentnej specjalizacji w ujęciu regionalnym.

**Słowa kluczowe:** smart specialisation, zarządzanie innowacjami, województwo śląskie, Górna Austria