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Spatial Development Follows Digitization

Lars Rettig and Morten Friedrichsen

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Abstract

Two economic sectors, which massively depend on mobility, are considered in this article: logistics and tourism. The Fehmarn-Belt Fixed Link Area will be a challenge for these economic sectors. Educational institutions provide the skillsets for managers in this new emerging region. This present research therefore examines which portfolios of spatial- and content-related courses and modules are necessary for shaping future competences in the Fehmarn-Belt Fixed Link Area. For this purpose, theoretical approaches in spatial development and trends in digitization are looked at. An industry structure analysis (Porter's Five Forces) is used to examine the potential effects in two economic sectors. Deduced from that, the following questions are raised: which competences will be needed in the future? What can educational institutions like universities do to contribute to that skillset? Based on their analysis, the authors suggest a Fehmarn-Belt Network of universities offering online courses on an academic level. Together, they create, translate, share and refine the modules and develop the Fehmarn-Belt Fixed Link Area from an educational perspective.

Keywords: spatial development, mobility, Fehmarn-Belt Fixed Link, intercultural competences, tourism, Nordic management, logistics, online modules, mutual learning, e-learning

1. Introduction

The planned Fehmarn-Belt Fixed Link between Germany and Denmark increases mobility in the Baltic Sea region, thus involving not only spatial and economic implications but also social, cultural, and ecological implications. Especially, the logistics and the tourism industry in the Baltic Sea region are required to seize the opportunities offered by the permanent crossing and hereby sustainably shape the new space. Therefore, intercultural competences are

necessary for the next generation of managers dealing for instance with tourism and logistics in this area. In that respect, suitable educational offers should be set up in a timely manner.

2. Theory

2.1. Spatial development

It seems as if the trend toward increasing networking and interlacing of spaces beyond the borders of countries, which appeared to be unstoppable a few years ago, is currently slowing down. The reasons for this are both economic (neo-protectionist tendencies) and political (destabilization of the EU). However, in specific cases, there are still considerable efforts to develop cross-border spaces.

The interests of the actors are manifold: from a political point of view, intensified international cooperation also means a peace guarantee. Economic interests arise on the one hand from the opening up of new markets and on the other hand from the generation of mutual benefits (classical theory of free trade). In this context, cross-border clusters of industries (Porter) or the targeted promotion of networking (e.g. by the implementation of Interreg programs) are often focused on.

One of the ambitious projects for the development of large-scale spaces is the construction of a fixed Fehmarnbelt crossing, which has been planned for years. It would allow a much faster connection between Germany and the Scandinavian area.

It is obvious that such an undertaking leads to controversial debates. In addition to the fundamental question of whether the project should be implemented at all, there have so far been considerable delays due to stakeholder resistances, planning deficits, and nonconsideration of the framework conditions.

That being said, it becomes clear that the development of large-scale spaces such as the Fehmarnbelt region would present considerable challenges for economic players and stakeholders even under comparatively static conditions. These requirements (but also the possibilities) are intensified though, if one considers that the creation of *physical* spaces is accompanied at the same time by the progressive development of *virtual* spaces.

2.2. Digitization

The rapid development in communication technology affects many areas of life. Job profiles are changing, the workplace itself is changing, and it is becoming more and more mobile. Everything that can be automated can be digitalized. Downes [1] progressively states that knowledge is no longer bound to people but is distributed in the Internet and accessible for everybody. YouTube tutorials explain almost everything imaginable. However, not only in business, but also in private life, the way we communicate, share, and live is massively

influenced by online communication via smart devices such as smart phones, tablets, smart watches, and data glasses. The penetration of smart phones in Western Europe stands at "around 70 percent and will continue to grow to around 85 percent by 2022" [2]. We have constant access to the Internet with mobile phones and even free WiFi in many places. There are even multiple phone contracts per person, as the number of mobile subscriptions in Western Europe now surpasses the number of citizens [2]. The digital data web is like a constant enhancing layer over the analogue world.

Digitization is a megatrend that affects everything from private life and the individual workplace to production processes (*Industry 4.0*) and complete supply chains (*digital SCM*¹). Consequently, building up digital competences in the future workforce (*digital literacy*) will be a key factor for safeguarding the employability of future employees. The current Global Industry 4.0 Survey shows that the biggest challenges regarding digitization are internal ones such as culture, organization, leadership, and skills rather than external issues such as infrastructure, intellectual property protection, data security, or privacy concerns [3]. The highest scoring item (50%), regarding the question of where the biggest challenges for building digital operations capabilities were, was the lack of digital culture and training [3]. The study therefore suggests focusing on people and culture to drive transformation (compare Section 4.2 of this article).

Digital technology enables collaborative working independent of time and location, i.e. people connect and meet in chats or web conferences wherever and whenever they want and need. Communication nowadays is not in need of fixed links—like the fixed link across the Baltic Sea—any more. However, the exchange of commodities requires both physical connection and professional intercultural communication alike.

That leads to the conclusion that there is a mutual reinforcing effect of spatial development by the fixed Fehmarn-Belt link and the digitization of many areas of life. The latter explicitly has a pacemaker function, because it alone has the capability of changes for the region—even if there were no tunnel.

2.3. Porter's Five Forces

The consequences for the economic actors in the region can be derived from the developments shown above. We shall first examine the specific effective contexts as well as opportunities and threats.

As a methodology, Michael Porter's industry structure analysis (also known as Porter's Five Forces, see **Figure 1**) is used. This makes it possible to describe the situation of companies and institutions in their environment and to derive strategic impulses.

The influencing factors are customers, new competitors, suppliers, substitute products, and ultimately the intensity of the competition in the industry itself.

¹ Digital SCM = Digital Supply Chain Management.

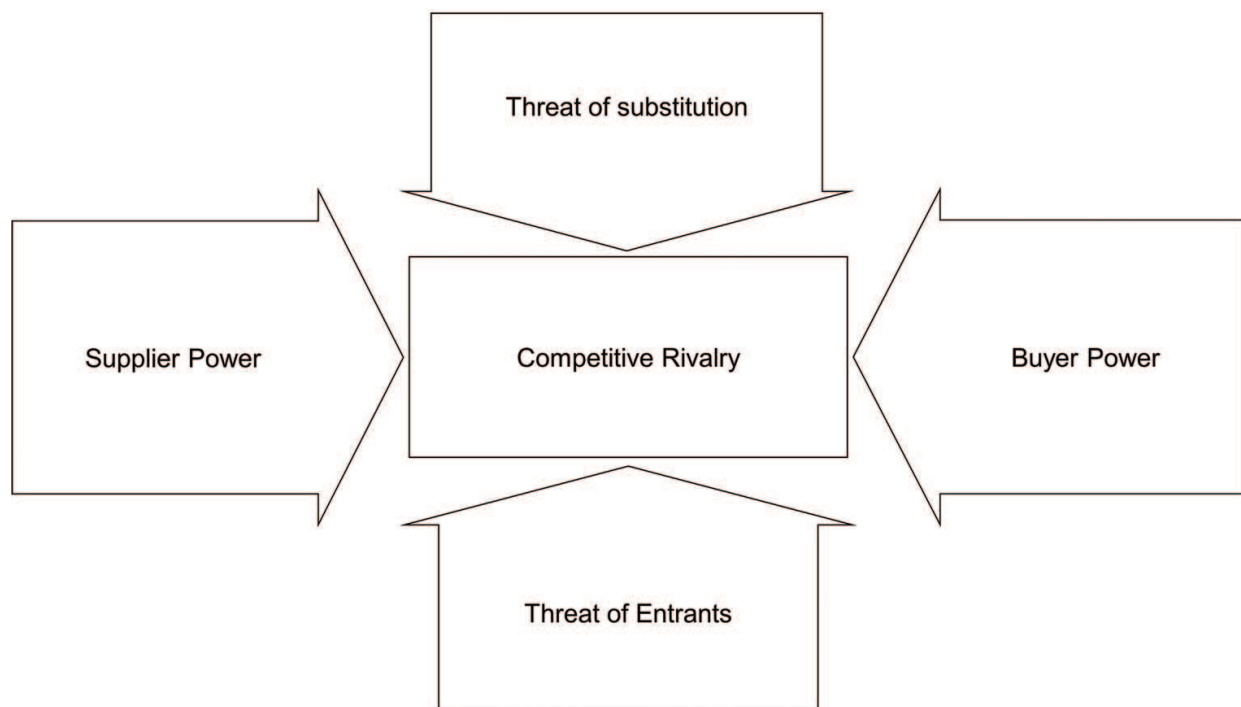


Figure 1. Porter's Five Forces (own depiction based on Porter [4]).

3. Application of the industry structure analysis

3.1. Logistics

In the following section, the Five Forces methodology will be applied to the logistics sector against the background of the construction of a Fehmarn-Belt Fixed Link.

First, the *competition intensity* within the industry itself is considered. A fixed Fehmarn-Belt crossing would be a catalyst for the establishment or strengthening of a North European region, which would lead to new market opportunities and new growth potential. Thus, one can assume that from the beginning, an intensive struggle for the resulting opportunities should be carried out. Moreover, among the established players, there are also companies that could suffer from the new connection. For example, in the case of the Port of Hamburg, it is to be assumed that a large number of transactions that previously took place by sea would be subject to a thorough economic examination.

As far as the *negotiating power of the customers* is concerned, this is a significant factor due to the comparatively high (and possibly increasing) number of logistics companies and potential transport routes. Furthermore, customers are increasingly more well-informed as a result of digitization, which may lead to easier substitution of established business relationships. In addition, however, it must be pointed out that the customers of the logistics industry will also benefit from new market opportunities and, accordingly, a rising demand for transport is expected.

On the *supply side*, the logistics sector depends on vehicle manufacturers and the suppliers of complementary products (in particular the mineral oil sector). An increasing number of market transactions also mean an intensification of this relationship.

The market entry of *new competitors* poses a significant threat to existing players in the logistics sector. It can be observed that commercial enterprises (e. g. Amazon) are expanding their activities and beginning to integrate logistics services by themselves (*vertical integration*). Against the background of new market opportunities, the attractiveness of such efforts is also increasing.

The number of fitting *substitutes* with respect to the classic logistics sector is limited. It is possible to think about alternative routes, alternative transport channels, and alternative providers. These possibilities were already numerous, and—as already described—they are likely to increase. Nevertheless, the physical transport of a commodity from start to finish cannot be replaced. A withdrawal from the market occurs only when commercial enterprises set up their own logistics networks and sites, thus rendering the services of the classic logistics sector obsolete (**Figure 2**).

Leaving the mobility of commodities and the influencing factors on logistics, the next section deals with the Five Forces influencing the touristic service in the fixed Fehmarn-Belt link.

3.2. Tourism

Tourism and mobility are closely linked. This is because tourism is a service that requires the mobility of clients/customers to create the touristic “product.” Tourists have to travel to

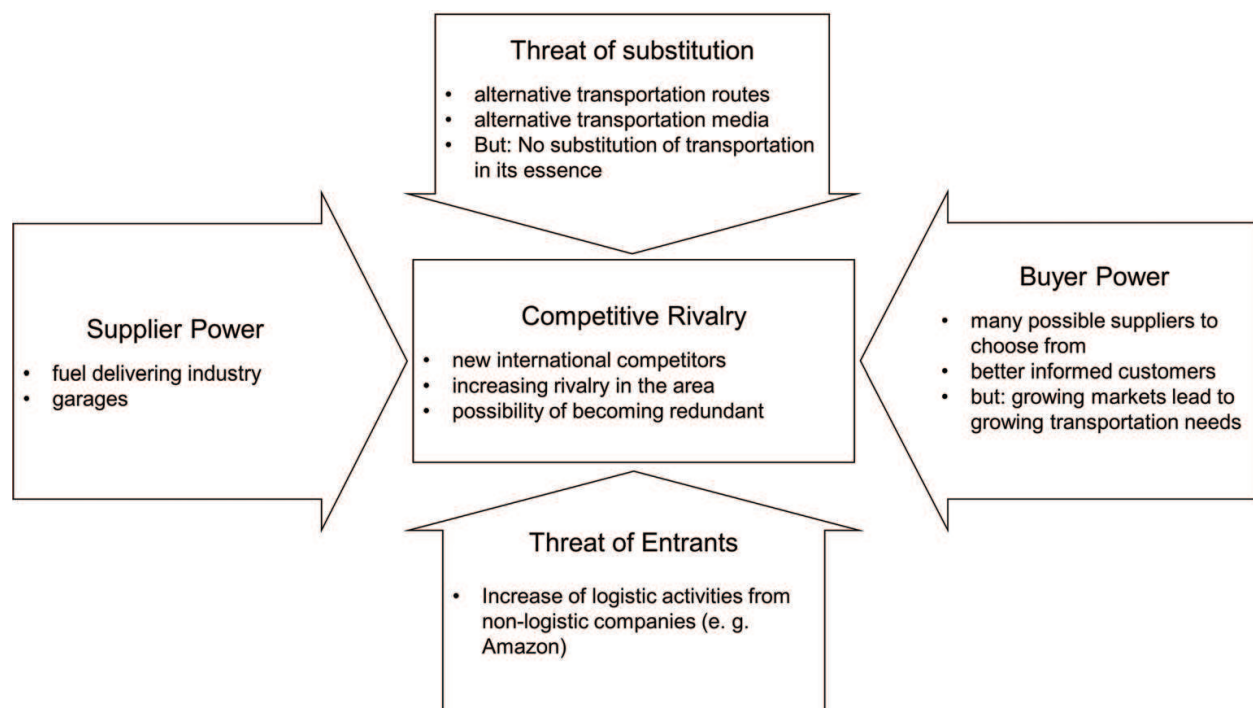


Figure 2. Porter’s Five Forces applied on logistics in the Fehmarn-Belt Area.

the destination and avail of the touristic service for instance by sleeping in a hotel, cycling in the region, or dining in a restaurant. By doing so, the touristic service can be performed (*uno-actu principle*).

For destinations, it is mission and challenge alike to create touristic space. It forms part of the presentation of the region. The valorization of space for tourists is also regarded as a form of production of space. Destination marketing organizations attempt to attract the interest and catch the eye of the tourist: information offers before the journey (website, flyer, and pictures in google maps), information about sites to be seen, places to cater to one's needs, and special insider tips are staged and promoted. Urry and Larsen [5] therefore coined the term "the touristic gaze." In managing that touristic view of the region, the two driving forces, digitization and spatial development mentioned above, have impacts on the work of destination marketing organizations in the Fehmarn-Belt region. To analyze the potential effects the planned link across the Baltic Sea will have, Porter's Five Forces analysis [6] will be applied in the following paragraphs on the touristic sector in the region. How will the intensity of rivalry between competitors be affected? What are the threats of new entrants due to the changes in the region? What are possible substitutes for the touristic product in the region? How will the power of the buyers change? What are the possible changes in the touristic supply of the market?

Regarding *industry rivalry*, the new connection offers access for international competitors. This might increase rivalry in the area. Likewise, it creates opportunities for cross-border cooperation.² New partnerships of Baltic Sea regions in Denmark and Germany might form new marketing cooperation to offer new touristic products or bundles (for instance, forming an itinerary to highlight lesser-known Viking sites with the same history in the Baltic Sea area).

As this is a chance for cooperation on the one hand, it poses a *threat of new entrants* to the market on the other hand. Touristic regions in Denmark and southern Sweden that so far have been a 'long haul destination' will be closely linked to Germany's East Coast. Baltic Sea tourists have easy access to these destinations. Incoming agencies from Scandinavia might like to attract day-trippers from the German side of the tunnel and vice versa. Suppliers of restaurants and hotels from Scandinavia might like to sell the product to the German food and hotel industry and vice versa, due to an easier connection via the tunnel.

Touristic carriers such as ferries and cruise ships will especially face the *threat of substitutes*. All the new options for cross-border carriers that use the fixed link, such as buses and taxis, are new entrants to the touristic carrier market.

Regarding the better reachability of Denmark and southern Sweden, it is likely that potential tourists of the German Baltic Sea region will start to compare prices for their holiday with these alternatives as well. The quick link to Scandinavia makes traveling more comfortable and the decision to do so much easier. Besides, taking their own car through the tunnel

² Göttel [7] examined how and why cross-border cooperation in borderland destinations could be a way to intensify competition and development of the border destinations. One of the key findings of her literature review was that building trust is a critical success factor for corporations [7, p. 69]. Further aspects for successful cooperation were communication, mutual learning routines, inter-organizational learning, exchange of knowledge and successful conflict management [7, p. 71].

increases mobility for tourists in the travel destination. The *bargaining power of customers* increases. Day trips from and to Scandinavia are easy to arrange using the tunnel. Buying power might shift between these regions.

The *bargaining power of suppliers* can be viewed from different perspectives in the tourism industry. Suppliers can be seen as food and material suppliers for touristic core services such as hotels or restaurants. They might expand their clients to hotels and restaurants on the other side of the tunnel, increase their existing portfolio, and supply more or different clients. Broadening the concept of suppliers to the carriers, we might then speak of the same suppliers, which the logistic branch is dealing with (see Section 3.1). These are for instance the fuel delivering industry facilitating travel, the garages alongside the new transport axis ensuring repair services, as well as further services such as car washes (**Figure 3**).

3.3. Deduction of competences

New competences are required to manage tourism and logistics in the region. On the basis of the fixed link, tourists and companies have easier access to the new markets. Due to touristic actions (day trips and entire holidays) and new business relations between firms, buying power that would have stayed in the region could move across the border.

In this sense, growing mobility is understood both as an opportunity and as a threat. The intensified competition and (among other things in the course of digitization) more enlightened customers require actors to be thoroughly prepared for the new challenges.

For both the tourism sector and the logistics sector (for which mobility is a key factor), specific competences in need of development can be derived.

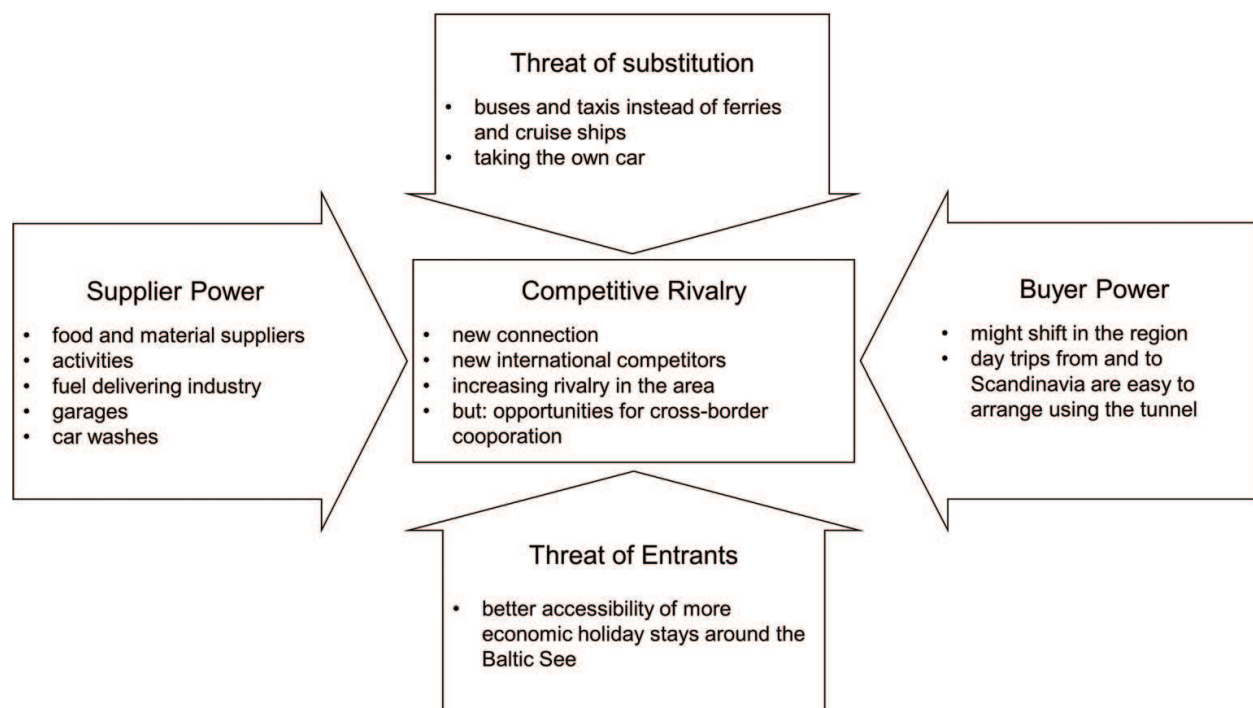


Figure 3. Porter's Five Forces applied to the tourism sector in the Fehmarn-Belt Area.

In a classical sense, educational institutions, such as universities, first assume the function of knowledge transfer. Thus, it is necessary to make *market knowledge and market competences* accessible to economic actors. It is therefore all the more important to have a sound knowledge of trade and traffic flows, economic and social policy, and the legal framework, especially as a result of the clearly no longer delimited economic boundaries. The knowledge of the macroeconomic environment has put the players in a position to critically develop, implement, and evaluate company strategies.

Another essential element is the ability to *work and cooperate internationally*. Numerous nations would participate in the newly emerging or strengthened markets by means of a Fehmarn-Belt Fixed Link, which particularly in industries such as logistics and tourism requires appropriate competences.

To achieve this, *intercultural competencies* are of the essence. Even in seemingly comparatively homogeneous spaces such as the Fehmarn-Belt region, there are clear cultural differences that affect business life and can be a key factor in determining the success or failure of economic relations.

In a fundamental sense, *language skills* are also necessary. In addition to English as a lingua franca, the importance of German and Scandinavian languages is obvious. Due to the numerous customer relationships among the industries under investigation, it is clear that profound knowledge is indispensable here.

Another important aspect is *networking skills*. This is true in both digital and analogue respects. While the importance of communication will not decline on a personal level, an additional intensification of digital networks will be indispensable. Accordingly, economic actors must be prepared to use them sensibly and avail trends.

In this context, *digital literacy* is also to be mentioned. Today, it is impossible to imagine working without information technology in everyday life. However, since the use of the resulting possibilities is always limited by the human factor, competence development in this area is highly promising in order to gain competitive advantages.

In general, in the face of increasing complexity and growing interdependencies, the training and honing of *critical and analytical thinking* are indispensable. As stated above, it is still the human being that—regardless of digital possibilities and developments—defines basic goals and strategies.

In summary, it can be said that education institutions in the future will still be concerned with the transfer of knowledge, but more and more specific competencies and skills will come to the fore. It is only in this way that it is possible to master the challenges arising from new (physical or digital) spaces.

4. Discussion of the results

On the one hand, the previous section have shown influencing developments, digitally and spatially. On the other hand, Porter's Five Forces have been used to analyze the threats and potentials of the new mobility of commodities and tourists in the area.

To sum up, the lack of digital culture and training is the biggest challenge companies are facing regarding digitization. Literature has shown that cross-border cooperation in borderland destinations could be a way to intensify competition and development of the border destinations. Mutual learning routines, interorganizational learning, and the exchange of knowledge are key factors for prosperous companies and their cross-border cooperation [7, pp. 69–71].

Thus, the task for educational institutions is clearly set out: build these much-needed competences (see Section 3.3) in a timely fashion, so that future employees, especially in the above-mentioned areas of logistics and tourism, are well prepared for managing companies in the region. How can higher educational institutions contribute to that task? What do they have to do to qualify and train future graduates in this specific area? Which modules will lead to the desired profile of the alumni? Which courses need to be created, developed, and reviewed?

The following paragraphs suggest a couple of specific modules and skill sets that the future managers along the Fehmarn-Belt Fixed Link Area are likely to need in the areas of logistics and tourism. Apart from modules regarding the economic sector of logistics and/or tourism itself, this field requires advanced knowledge of economic and social policy in Northern Europe and about flows of trade and traffic in Scandinavia and Europe. International Marketing Management with a focus on the Baltic Sea markets rounds off these hard skills for ‘Nordic’ managers.

Equally, soft skills are mandatory in intercultural management, conflict management, project management, presentations, and negotiations. Furthermore, language skills are required in the Scandinavian languages, German and English.

To practice intercultural learning routines, interorganizational learning and the exchange of knowledge (see above), web- or cloud-based learning might be a fitting way to build up digital literacy, exchange knowledge, document (organizational) learning processes (*e-portfolio*), and practice and elaborate the use of technology such as advanced web conference systems, for instance, Adobe Connect. Learning online in a cross-border cooperation, with students from foreign universities in the Baltic Sea area, is the harbinger of the future cross-border market that will emerge in the Fehmarn Belt Fixed Link Area.

At first glance, it might have appeared paradoxical that an online course offer—independent of place and time—can create a new space. However, it becomes more understandable on a closer inspection. An exchange of modules with other universities in the specialization *tourism* and *logistics* could be made possible precisely by digitizing the modules. In the online or blended learning format, the students of the participating universities (e.g. from Sweden, Denmark, and Germany) are in a mutual learning process; they exchange knowledge and learn something about themselves and about each other; and they work together on case studies and research projects. In addition to intercultural, social, and media competences, the students build up a personal contact network they have learned to cooperate and will do this later in their professional international context. That means the real mobility via the Fehmarn-Belt Fixed Link follows the digital interlinking.

4.1. Critique of methodology

In this article, the industry structure analysis is used to paint a picture of future competences in the new emerging market of the Fehmarn Belt Fixed Link Area. So the competences

listed in this article (see Section 3.3) were deduced from this analysis, theories of spatial development, and trends in digitization.

To verify/falsify and thereby clarify the suggested profiles of future managers in the areas of logistics and tourism in the future Fehmarn-Belt Fixed Link region, deeper analysis is required. For instance, job advertisements for companies in the area could be analyzed to survey required competences quantitatively. Managers of companies in the region could be interviewed qualitatively about their view as experts who already conduct business in the area before the fixed link is built. What are their expectations, concerns, and ideas for future development of their company regarding the change caused by the fixed link? Coming from this analytic point of view, this article offers opportunities for further investigation.

4.2. Recommendations for action

This present research has examined which portfolios of spatial- and content-related courses and modules are necessary for shaping these future competences in the area.

Reasonable further steps for universities interested in creating a cross-border study program could be the formation of the network to foster cross-border collaboration and share and refine the portfolio of modules together. An exchange of modules with other universities in the specialization areas of tourism, knowledge management, and logistics could be made possible, precisely by digitizing the modules. A resulting challenge for higher educational institutions will be finding the right higher education partner for cooperation and coproduction of intercultural and mutually creditable modules and curricula.³

As the potential network of universities needs to address international target groups and prospective international students, their joined forces approach of cross-border cooperation might have positive effects on marketing and offers like this. Therefore, it is an example for cross-border cooperation itself. Another target group is the employers in the area. They need to be informed about the new educational offers and the advantages digitalized learning formats have for intercultural training and education in the economic area of the Fehmarn-Belt Fixed Link.

Overall, this current research has provided some ideas on which portfolios of spatial- and content-related courses and modules are necessary for shaping future competences in the area. The suggestions are based on theoretical approaches to spatial development, trends in digitization, and an industry structure analysis (Porter's Five Forces) for two economic sectors largely affected by the fixed link across the Baltic Sea. In creating a cross-border online study program, sharing modules, and refining them together, universities might be able to build up the competences now that future managers in the area will need when the Fehmarn-Belt Fixed Link opens up.

³To start a course offer based on the ideas discussed above in a pragmatic, hands-on way of doing, in a first step, modules from the specializations Nordic Management, Tourism, and Logistics from the West Coast University of Applied Sciences in Heide, Germany, for instance, could be made available for an international target group. They could be shared, translated, and refined together as online courses with other universities in the context of this emerging economic area of the planned Fehmarn-Belt Fixed Link.

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