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The intermediary as an institutional entrepreneur: institutional change and stability in triple-helix cooperation

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Abstract

This paper aims to illustrate how the triple-helix concept can be implemented on a city level by establishing an intermediary among the scientific, economic, and public administration spheres and civil society. By using the example of Bielefeld 2000plus, an initiative founded for this particular purpose, this paper shows that in today's knowledge society, certain inter-organizational conflicts and challenges regarding cooperation may arise that an intermediary actor can channel efficiently. Furthermore, Bielefeld 2000plus serves as a prototypical example and is used to derive a theoretical model of such an intermediary actor as both the product of and platform for institutional entrepreneurs who try to elicit institutional change. Drawing on extant literature that examines intermediaries with the triple-helix concept, as well as institutional entrepreneurs, this paper discusses how an intermediary can act as an institutional entrepreneur by adopting a bifunctional framework, with all the advantages and disadvantages that this entails. This framework is condensed into the Bifunctional Intermediary (BFI) Model, which may benefit researchers studying triple-helix processes and practitioners seeking to establish an intermediary.

Keywords: Intermediary, Triple helix, Urban development, Cooperation, Knowledge society

摘 要

本文旨在通过建立科学、经济、公共管理和公民社会之间的中介机构说明如何在城市层次上实现三螺旋概念。利用Bielefeld 2000plus 案例,即为这个特定目的而建立的行动方案,研究表明:在知识社会中,在合作过程中可能会出现某些组织间的冲突和挑战,它们可能由中间行动者有效地引导。此外,作为一个典型案例,Bielefeld 2000plus 既是试图实现机构变革的制度创业者们的产品,也是他们的平台,又被用来推导出这样一个中间行动者的理论模型。本文考察了三螺旋概念中的中介以及机构创业者的文献,讨论中介本身如何作为机构创业者通过采用一个具有所需的所有优缺点的多功能框架起作用。这个框架被浓缩为多功能中介(MFI)模型,它可以使研究三螺旋过程的研究人员和寻求建立中介的实践者都受益。

关键词: 中介, 三螺旋, 城市发展, 合作, 知识社会

Résumé

Cet article vise à illustrer la mise en œuvre du concept de Triple Hélice au niveau d'une ville par l'établissement d'un intermédiaire entre la science, l'économie, l'administration publique et la société civile. En prenant l'exemple de Bielefeld 2000plus, une initiative mise en place pour les besoins de la cause, l'article montre que dans la société du savoir, certains conflits et défis inter-organisationnels pouvant survenir en matière de coopération peuvent être efficacement canalisés par un acteur intermédiaire. En outre, Bielefeld 2000plus sert de prototype dans l'élaboration du modèle théorique d'un tel. acteur intermédiaire en étant à la fois le produit et la plate-forme des entrepreneurs institutionnels qui tentent de provoquer un changement institutionnel. S'appuyant sur une littérature examinant les intermédiaires et les entrepreneurs institutionnels dans le concept de la Triple Hélice, cet article explique comment un intermédiaire peut agir lui-même en tant qu'entrepreneur institutionnel par l'adoption d'un cadre multifonctionnel, avec ses avantages et inconvénients. Ce cadre est. condensé dans le modèle d'intermédiaire multifonctionnel (IMF) qui pourrait profiter aux chercheurs qui étudient les processus de la Triple Hélice et aux praticiens cherchant à établir un intermédiaire.

Mots-clés: Intermédiaire, Triple Hélice, Développement urbain, coopération, Société du savoir

Resumo

Este artigo almeja ilustrar como o conceito de Hélice-Tríplice pode ser implementado em nível municipal ao se estabelecer um mediador entre ciência, economia, administração pública e a sociedade civil. Ao usar o exemplo de "Bielefeld 2000plus", uma iniciativa fundada com este propósito em particular, o artigo mostra que a sociedade baseada no conhecimento, certos conflitos interorganizacionais e desafios a respeito de cooperação podem surgir e ser eficientemente canalizados por um ator intermediário. Além disso, "Bielefeld 2000plus" serve como um exemplo prototípico e é usado para obter um modelo teórico de um ator intermediário ao ser o produto de e uma plataforma para empreendedores institucionais, que visam promover mudanças institucionais.

Aproveitando-se dos mediadores examinadores de publicações no conceito de Hélice-Tríplice, bem como de empreendedores institucionais, este artigo discute de que forma um mediador pode agir como empreendedor institucional em si ao adotar um framework institucional com todas as vantagens e desvantagens que lhe são implicadas.

Este framework é consolidado no Modelo Intermediário Multifuncional que pode beneficiar pesquisadores ao estudar os processos e os praticantes de Hélice-Tríplice, visando estabelecer um mediador.

Аннотация

Настоящая статья посвящена использованию концепции тройной спирали в развитии городов путем установления взаимосвязей между наукой, экономикой, местной администрацией и гражданским обществом. На примере инициативы Bielefeld 2000plus, принятой для решения такой практической задачи, в данной статье показано, что в обществе знания ряд возникающих внутренних конфликтов и вызовов, связанных с кооперацией, могут быть эффективно

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разрешены благодаря привлечению промежуточных участников. Кроме того, Bielefeld 2000plus используется в качестве прототипа для создания теоретической модели для описания деятельности посредников и выступает в качестве модели и платформы внедрения институционального предпринимательства и институциональных изменений. В настоящей статье представлен обзор публикаций, посвященных деятельности посредников в рамках теории тройной спирали и институциональным предпринимателям; в частности, здесь рассматривается возможность принятия посредниками роли институциональных предпринимателей и реализации многофункциональной модели со всеми опосредованно связанными достоинствами и недостатками. Данный подход определен как Модель многофункционального посредничества и может быть полезен как исследователям, изучающим свойственные трехспиральной модели процессы, так и практикам, занимающимся привлечением посредников.

Ключевые слова: посредниктройная, спиральгородское, развитиекооперацияобщество, знания

Resumen

Ilustramos aquí cómo se puede implementar el concepto de Triple Hélice a nivel municipal estableciendo un intermediario entre la ciencia, la economía, la administración pública, y la sociedad civil. Estudiamos aquí el caso de Bielefeld 2000plus, una iniciativa fundada para tal propósito, que revela la manera en que ciertos conflictos y desafíos inter-organizativos pueden canalizarse de manera eficiente por un actor intermediario. Además, Bielefeld 2000plus sirve como un prototipo que utilizamos para derivar un modelo teórico de un intermediario que es, a la vez, producto y plataforma de empresarios institucionales.

A partir de las literaturas que examinan intermediarios en la Triple Hélice, así como emprendedores institucionales, presentamos aquí un Modelo de Intermediario Multifuncional (IMf) que actúa como un emprendedor institucional, con todas las ventajas y desventajas de tener múltiples funciones. Este modelo IMf es nuestra contribución para los investigadores de los procesos de la Triple Hélice así como para los profesionales que buscan establecer intermediación efectiva en ecosistemas de innovación.

Palabras Clave: Intermediario, Triple Hélice, desarrollo urbano, cooperación, sociedad del conocimiento

Multilingual abstract

Please see Additional file 1 for translation of the abstract into Arabic.

Introduction

The growing importance of scientific knowledge and the subsequent increased cooperation between universities and corporations means that the boundaries between science and the social environment are being crossed at a higher rate than before (Leydesdorff 2000; Leydesdorff et al. 2015; Leydesdorff and Fritsch 2006). Many areas of society,

including organizations, are more and more dependent on scientific knowledge, so they have been trying to influence scientific knowledge production according to their specific needs. For organizations based in the scientific system, this also means rapid change as the possibilities for allocating financial resources incentivize them to broaden their scientific activity and shift their focus toward producing applicable knowledge (Fisher and Atkinson-Grosjean 2002). These developments have led social scientists to call modern society a knowledge society (Karpov 2016; Stehr 2001).

The advancement of knowledge also affects cities and regions in their efforts to be competitive and adapt to this new global knowledge society's requirements. Higher education institutions (HEIs) and their successful utilization in regional development have become a key factor for economic growth and social development. However, modern society remains a differentiated society; therefore, the scientific, economic, political, and educational spheres operate fairly independently of each other and select for themselves—and according to their operations—which elements of the social environment affect them (Luhmann 1977). This makes building networks and embedding science in the broader social context a challenge. Furthermore, most of these activities take place within organizations that have a strictly formalized way of dealing with their environments, making change and external influence nearly impossible. Here, the concept of the triple helix can shed some light on the possibilities and recent evolution of cooperation among scientific, political, and economic spheres (Etzkowitz 2008; Etzkowitz and Leydesdorff 1995). To optimize this cooperation, to ensure that the dialogue is as open as possible, and to minimize conflict, an intermediary among these spheres can be useful (Bellgardt et al. 2014; Caloffi et al. 2015; Cantner et al. 2011; Howells 2006). This role can either be performed by an individual (Frølund and Ziethen 2016) or by an organization that provides services and counseling (Howells 2006).

In a knowledge society, societal fields face new challenges that force them to change. For instance, scientific studies often are needed to inform political decisions, and companies need strong research and development (R&D) departments or must cooperate with universities to keep up with competitors in terms of technological innovation. However, institutions and organizations tend to be relatively stable, so some disruptive force or "creative destruction" (Schumpeter 2010 [1942]) is necessary to facilitate change.[1] Hence, actors who envision and enact such change are needed—actors who, in neo-institutionalist theory, are called "institutional entrepreneurs" (Fligstein 1997; Garud et al. 2007). This paper explores the relationship between intermediaries and institutional entrepreneurs in triple-helix relationships, focusing on urban and regional development and on whether it is beneficial if one actor assumes both these roles. This actor would need to adopt certain characteristics, including a degree of independence from special interests and political affiliations. The actor's principal goal would be to establish long-lasting networks with different organizations, adapting to societal developments that require knowledge. This alone requires institutional entrepreneurship.

To conceptualize such an intermediary's work, illustrate benefits, and reflect on shortcomings and risks, this paper presents a prototypical example of a regional initiative, Bielefeld 2000plus. Since 1997, Bielefeld 2000plus has developed into an intermediary that brings together educated and motivated citizens from the higher-education, economic, and political spheres and civil society to generate and transfer knowledge that benefits the city and region of Bielefeld, Germany, as a whole. Thus, Bielefeld 2000plus' intermediary

work can serve as an example of institutional entrepreneurs' functionality and effects in three ways: first, it is the work product of several individuals who were willing to change the university's orientation toward society, as well as the public administration's relationship with knowledge-producing organizations. Second, it acts as an institutional entrepreneur itself, in that it builds working groups across organizational boundaries that find innovative solutions to pressing problems in the region. Third, it creates room for discussions and cooperation, providing individual institutional entrepreneurs with the possibility to influence existing structures and norms.

Accordingly, this article is structured as follows: first, a brief introduction to the analysis of the modern knowledge society is provided, including its implications for regional and urban development and competition. Second, the concepts of the triple helix and its intermediaries as institutional entrepreneurs being a means for innovation and efficient cooperation among economic, political, and HEI spheres are introduced. These theoretical outlines will frame Bielefeld 2000plus as an actor that manages, overlooks, and mediates the triple helix's work to support successful cooperation and elicit change. Some of Bielefeld 2000plus' principal characteristics are considered from a more theoretical perspective and condensed into an intermediary model that allows for generalization and implementation. This model is called a Bifunctional Intermediary (BFI) model because it combines traditional intermediary functions. To illustrate and discuss the model's strengths and weaknesses, this paper showcases some exemplary projects that Bielefeld 2000plus has organized and managed over the past 20 years and reflects on their regional impact and how to improve cooperation. The paper concludes with a critical reflection on problems and possible flaws and presents recommendations for actors who want to implement the BFI model in other regions and cities. Finally, some topics for future research are presented.

From industrial to knowledge society in regional development

Since the 1960s and 1970s, examining modern society as a knowledge society has been an important topic in the social sciences (Cerroni 2018; see Stehr 2001). During the Industrial Revolution, the crucial factors for production and development became natural resources and manual labor, but in the second half of the twentieth century, scientific knowledge took over, culminating in the "knowledge economy" (Williams 2010, Chapter 1). Thus, the importance and production of, as well as the interest in, scientific knowledge have gone beyond the scientific realm, and the most important reason why is the advancement of information and communication technology (Kahin and Foray 2006). Technological development has given rise to the need for more knowledge-based production, with scientific knowledge being one of the most important resources for the economic sector (Williams 2010). More frequently, companies produce scientific knowledge and need scientifically trained personnel for their production (Karpov 2016). Therefore, the connection between science and the economy becomes a determining factor for success in both areas. Thus, the transfer and utilization of knowledge in other fields must be organized and optimized by building cooperation networks, a process that has led to knowledge transfer becoming the third mission of universities, after research and teaching (Vorley and Nelles 2008).

Additionally, scientifically produced knowledge has become the basis for decision-making processes in politics and public administration (see Stehr 2001). In a knowledge society, development at all levels depends on the successful application of scientific knowledge, and several specific challenges—as well as opportunities—arise for urban and

regional planning (Holley and Harris 2018; Kronberga et al. 2010). Studies show that in the twentieth century, scientific organizations have grown and become one of the most important factors for companies to invest in specific regions (Harrison and Turok 2017). Therefore, the prospect of cooperation between companies and universities is viewed as beneficial, particularly in knowledge-based industries. In addition, universities also elicit positive social and cultural change in cities or regions, motivating people to relocate to these areas to start their own businesses or become part of the available workforce. The integration of universities—and, thus, scientific-knowledge production—into urban planning and development processes carries quasi-political implications that have proven advantageous. Citizens have the opportunity to participate in these processes on a level beyond ordinary dialogue-oriented participation formats. Concepts such as "citizen science" (Mueller et al. 2012) allow citizens without scientific backgrounds to participate in active knowledge production and empirical research. Using this research to inform and affect planning processes can enable citizens to partake in political decisions that impact them directly. Thus, the transformation of modern society into a knowledge society can mean strengthening the local democratic process and expanding scientific knowledge.

All these factors point to the connection between space and knowledge becoming increasingly relevant. Though seemingly contradictory, the use of new technology and more virtual communication has not led to a delocalization of political planning. Instead, face-to-face communication and the maintenance of regional networks and structures often are key to successful urban planning and innovation (Howells 2002; Howells 2012; Howells and Bessant 2012). In light of the knowledge society also being an increasingly globalized society, this is a surprising development. However, changing local structures that help adapt to global developments—in this case, intensifying local face-to-face communication to deal with the demands of a globalizing knowledge society—is to be expected. Thus, regional and urban levels can be viewed as reflections of the global level. The reason for this development lies in the importance of tacit knowledge, i.e., knowledge that "has not or cannot be made explicit" (Collins 2010; see also Polanyi 2013 [1966]). To combine scientific knowledge production with urban and regional planning activities, it can be useful to be aware of the need to initiate communication between explicit (i.e., formalized) and tacit (i.e., informal, [inter-]personal) knowledge forms.[2] Tacit knowledge is connected to the individuals involved in processes and in informal organizational structures that function, but are not formalized, through laws, rules, or hierarchies. Therefore, building networks of individuals who can contribute not only their technical expertise, but also their tacit knowledge of processes and informal structures, as well as their ability to deal with specific people, creates the possibility of realizing a knowledge society on regional and urban levels. If such individuals feel personal loyalty toward a cooperation project or network, their "knowing what" can be utilized as much as their "knowing how" (Polanyi 2013 [1966]). This tacit knowledge is needed to ensure that scientific knowledge is being implemented pragmatically and with a long-term perspective. If the particular cooperation works, a new societal arrangement develops that can be theorized using the triple-helix approach.

The triple helix and intermediaries as institutional entrepreneurs

Initially focused on technological innovation that benefits economic development (Leydesdorff 2000), the triple-helix concept is a useful illustration of the cooperative

dimensions of a knowledge society (Etzkowitz 2008; Etzkowitz and Leydesdorff 1995), describing the interconnectedness among universities, industry, and government and the developmental potential it holds for states, regions, and cities. It grows out of an already existing bilateral relationship between HEIs and industry (Metcalfe 2006). HEIs have initiated their own economic activities, trained personnel, and started working on the local economy's problems, while companies have shown interest in research activities. Several successful examples in these two spheres have shown that cooperation has become more necessary and increasingly valuable due to technological development and that the third sphere, government, was only involved afterward as a problem-solver (Etzkowitz 2008). The government stepped in when regulation was needed or changes to existing laws were deemed necessary. In the further evolution of the triple-helix process, cooperation became more frequent and long-lasting, as projects were initiated and councils were created. Therefore, the government became a vital part at an earlier stage of these processes and started initiating research projects and cooperation with HEIs (Bielak et al. 2008).

As previously mentioned, the three spheres intertwined in stable networks with the goal of successful development that can provide the most benefits for a region (see Etzkowitz and Leydesdorff 2000). However, such a cooperation does not necessarily exist without tension. Since all areas of society, particularly formalized organizations (Blau and Scott 1963), still operate on an independent basis and with their own ends being the primary motivation, conflicts of interest are likely to arise. As seen in the political system, a shared goal does not lead necessarily to a shared vision of how to achieve it, and what is deemed important in one area may not have as high of a priority in another.

The most promising solutions to such problems are an open dialogue and intensified cooperation. Accordingly, this paper proposes a model for long-lasting working groups and structures to focus on certain general topics and keep them open to individuals who may act as boundary spanners and multipliers in their respective activity fields. All organizations have formalized boundary-spanning positions that manage the organization's relationship with its environment (Aldrich and Herker 1977; see also Luhmann 1977). However, this formalization is a limitation that must be challenged if cooperation activities are intended to take on a new form. Hence, boundary-spanning personnel must partake in communication that has not been formalized as part of their official organizational role. This process is necessary to establish cooperation with new goals and new content; however, it must be handled carefully. The potential exists for intra-organizational conflict when personnel assume new roles outside their formalized positions. This risk is particularly present when it comes to governance and public administration. Here, processes often follow strict bureaucratic rules and laws, severely limiting the chances for the organization's members to get involved in institutional change. Interfering with ongoing bureaucratic processes from the outside is, therefore, difficult, and personnel are put at risk if they accept to cooperate with an external entity that tries to change structures. Van Meerkerk and Edelenbos (2017) show that certain conditions must be met for organizations to engage in new boundary-spanning activities that involve organizational leaders' actions; thus, internal processes determine how an organization can shape its boundary-spanning positions. This is problematic for any actor who tries to influence them from the outside. An actor who exists among the triple helix's spheres and acts as an impartial facilitator of network-based cooperation can support this process. Scholars who focus on building triple-helix

relationships have called this type of actor an intermediary (Frølund and Ziethen 2016; Howells 2006; Metcalfe 2010; Todeva 2013). This approach has several advantages over models of direct cooperation that only organizations' representatives organize: First, it does not exclude knowledgeable members of civil society who do not represent a triple-helix actor. Second, the networks typically are being kept active for a long time and, thus, are more open to new ideas. Third, it leads to individuals being able to act as institutional entrepreneurs by freeing them from institutional constraints to some extent. Fourth, it diminishes the potential for conflict by standing between possibly opposing interests. Fifth, it manages the complex trilateral relationships that are more demanding than bilateral university-industry cooperation (see Metcalfe 2010).

These networks must manage the ambivalence of self-referential knowledge production in science (Riviera 2013) and the growing need and importance of scientific knowledge in other societal spheres. Thus, following Frølund and Ziethen's (2016) analysis, to act as an institutional entrepreneur, this intermediary combines, at the very least, boundary-spanning and knowledge-brokering functions, making bifunctionality its most important feature.[3] This paper aims to analyze and illustrate this bifunctionality in an intermediary between conflicting interests that provides a forum for open communication and initiates, as well as supports and even partly manages, projects. To open up organizations and institutions to dialogue and cooperation, change must happen. Organizations need to adapt their boundary-spanning activities so that they are open to knowledge transfer from new sources. Setting up an intermediary for knowledge transfer is a change in the university's boundary structure, thereby constituting institutional change. Thus, this intermediary both originates from and acts as an institutional entrepreneur.

The concept of institutional entrepreneurship stems from the confrontation between actor-based theories of change and institutionalist and neo-institutionalist theories that stress the stability of structures and the difficulties of change. Institutional entrepreneurship is a way to bring actors "back into institutional theory" (Fligstein 1997). Institutions, according to institutionalist theories, are "societal values, norms and rules" (Cooney 2016) or "the humanly devised constraints that shape human interaction" (North 1992) that are not identical with organizations, but are part of their behavior and structures (Meyer and Rowan 1977). Some institutions are formalized (e.g., laws), while others are informal (e.g., behavioral expectations) in certain settings (North 1991, 1992). An example of an institution that is part of an organization is its boundary-spanning policy. Changing these complex social arrangements with many different actors involved is challenging and increases their vulnerability. Therefore, an intermediary that acts as an institutional entrepreneur must be cautious of the balance between necessary disruption and concern for important constraints that should not be changed.

Another balancing act that an intermediary working with long-lasting networks must be aware of is the attempt to initiate institutional change juxtaposed with its own level of influence to do so. As an actor, the intermediary is dependent on partners who are willing to cooperate. However, institutional change can be difficult and costly to realize (Bellgardt et al. 2014). Thus, in some cases, an organization must be convinced that change is necessary. Due to dependence on others, the intermediary can only use cooperative means to influence the direction of cooperation projects and usually wields less power than its partners. However, the intermediary can produce dependencies due

to information advantages and its networks. In this kind of mutual dependence, the intermediary must make itself familiar with the partners and address their concerns to understand how change can benefit all parties involved and, therefore, the city.

Methods and material

To present and analyze Bielefeld 2000plus as a prototypical intermediary in triple-helix relationships, we examined comprehensive empirical material, particularly protocols from sessions, correspondences, and published work. Some of these internal documents, especially protocols, were incomplete and needed to be complemented by others. Therefore, different types of documents needed to be analyzed together. As a standard part of scientific document analysis (Bowen 2009; Prior 2011), we reviewed this data and condensed it into three typical case studies of projects in which general themes and structures from Bielefeld 2000plus' work can be examined and explained. Up until now, Bielefeld 2000plus has published more than 60 discussion papers in which project results are presented.[4] In some of these projects, the results were printed as brochures in which the working process also was discussed. These particular documents needed to be handled carefully as sources of information because they were not necessarily accurate scientific descriptions of processes, but partly also showed tendencies to ignore or hide existing problems and conflicts. If an initiative is financially dependent on third parties, it may become necessary to maintain an image of success that can mislead the authors into hiding failures or obstacles in the process (Prior 2011).[5] The same problem exists with correspondences between Bielefeld 2000plus and external actors. Nevertheless, the publications and correspondences contain rich descriptions of the projects' goals, the people and organizations involved, and the data that have been generated and/or used.

The personal involvement of the authors in Bielefeld 2000plus can be used as a tool to remedy some of these problems. The first author holds the position of an executive director and is responsible for the initiation and management of projects, granting insights into working processes. The co-author has been scientific chair for more than 10 years and, therefore, was involved in all the projects described below and was acting between the realms of science and its environment. This experience is a source of information that holds potential, as well as risk. It grants an inside view of processes and structures that are not represented in public documents, but personal memories also contain misrepresentations of reality and, thus, cannot be used automatically as objective representations of events. However, confronting memory with written protocols and documentation of processes is a means to control for biased perceptions.

Intermediaries as institutional entrepreneurs: from Bielefeld 2000plus to BFI model

Initially founded in 1997 by a small group of individuals from the university, public administration, and local nongovernmental organizations (NGOs),[6] Bielefeld 2000plus was meant to be a project that focuses on perspectives for the city of Bielefeld at the dawn of the new millennium. Bielefeld is a medium-size German city with a population of about 335,000. In 1968, the University of Bielefeld was founded, and since then, six HEIs have followed. Bielefeld is the largest city in a region inside North Rhine-Westphalia, with many medium-size, technology-driven enterprises significantly impacting surrounding

towns and cities. In cooperation with the association Pro Bielefeld e.V., which focuses on promoting the city's image and brand, the project worked out a vision for the city with public educational events and excursions to specific areas of the region with interested citizens "on the ground." Thus, the project was not designed intentionally to be an inter-mediary in triple-helix cooperation, but turned out to be one by trying to start communi-cation and cooperation processes that extended the usual patterns. Consequently, after some time, it was not considered a project with a pre-determined ending point anymore, but rather an initiative working in long time frames, with long-lasting cooperation as a goal. Since Bielefeld previously had been involved in projects that tried to improve com-munication in the city, it financially supported the venture in cooperation with the univer-sity. At that point, Bielefeld 2000plus became an organizational entity with a well-defined structure and permanent members. One position that was deemed necessary to combine knowledge brokering with boundary spanning was a professorial scientific chair to man-age the strategic orientation and maintain relationships with the city's administration. On the one hand, this position functions as a multiplier and gatekeeper in the university context, e.g., to establish contact with the university's leadership and support boundary-spanning activity in the university's departments. On the other hand, it aids the allocation of financial resources by maintaining a sustainable relationship with the lord mayor—regardless of political affiliations or relationships. To achieve this, this position—and the initiative in general—maintains a politically neutral position. In addition to the scientific chair, an office with an executive director was established at the university to co-ordinate and initiate projects and cooperation meetings. Thus, the first official Bielefeld 2000plus employee was hired, plus a student assistant who helped with everyday bureau-cratic work. A strategic council comprising the city's lord mayor, several members of the university's rectorate and the city's administration, as well as citizens in high-level posi-tions of local NGOs, started to meet once a year to discuss Bielefeld 2000plus' work and future direction from a strategic perspective. From that point on, Bielefeld 2000plus' prin-cipal purpose was to facilitate dialogue and cooperation across organizational and institu-tional boundaries. During its 20 years of operation, it has tried to do so in different ways, ranging from public events to research on city-specific topics and regular meetings of working groups as a forum for exchange. These working groups were set up, again, by small groups of individuals who were invested personally or vocationally in specific topics and found it important to communicate across boundaries. They focused on different topics (e.g., urban development, environmental issues, culture, or sustainability) and became the basis for most of Bielefeld 2000plus' activities, although independent projects always have been conducted as well. However, it can be argued that these projects were only made possible through successful networking and maintaining relationships and on-going credibility as an actor. Thus, maintaining functioning networks and upholding good standing as a legitimate actor are the foundations upon which all activities are based. These activities combined several intermediary functions that can be boiled down to knowledge-brokering and boundary-spanning activities (Frølund and Ziethen 2016). By establishing Bielefeld 2000plus as a permanent actor, the university installed a new boundary-spanning position to enable cooperation with industry, public administration, and civil society. These boundary-spanning activities often include initiating or changing other organizations' boundary-spanning activities. This can work only when trust is in-volved, and such trust must grow over time (see Möllering 2008) and strengthen through
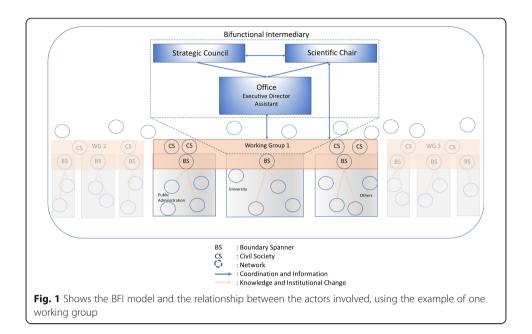
official university support. Bielefeld 2000plus established that trust over a 20-year period, which meant remaining in contact with people in important boundary-spanning positions, opening new communication pathways to other actors, and patiently building stable and reliable networks. This long-term perspective, which is meant to guarantee trust and an established name or even brand,[7] must be contrasted with the need for a certain degree of flexibility to be able to allow for the aforementioned disruption that is considered necessary for innovation. If a knowledge society is a development of society as a whole, it is not pre-determined what topic will need attention next to adapt to it. Thus, Bielefeld 2000plus does not fundamentally exclude any topics from its range of activities.[8] Aside from boundary spanning, knowledge brokering is Bielefeld 2000plus' second focus. Triple-helix relationships and networks can be viewed as a response to the development of the knowledge society, leading to a growing need for scientific knowledge outside the boundaries of science. An intermediary can help distribute existing knowledge and produce knowledge that other actors can build upon. Since Bielefeld 2000plus' principal focus was not to gather economically useful innovation, but rather to find innovative solutions to problems concerning the whole city, all actors have an interest in receiving that knowledge and applying it to their own activities. Thus, while boundary spanning is the *form* of this intermediary's activity, the knowledge brokering provides its *content*.

The idea of an intermediary acting as an institutional entrepreneur aims to produce innovative solutions to the city and region's problems, whether in the environmental, economic, or urban-planning spheres. To react accordingly, the networks must be spread widely and adaptable to new concepts. Thus, the intermediary always must balance stability and change.

Bielefeld 2000plus contains certain important characteristics that can be extrapolated into a model of an intermediary when confronted with the theoretical outlines above (see Fig. 1). Bielefeld 2000plus' generic structure has been developing into this model-like or prototypical structure over time due to its functionality. However, it also holds the risk of conflict and dysfunctionalities, the reflection of which is part of the following presentation and discussion of cases. These problems are not problems that occur during everyday working processes, such as communication difficulties or missing deadlines, but rather those that arise from the constitution of the model itself.

The first characteristic is the *formal structure*: a scientific chair, being a member of the university's professorial personnel, is a gatekeeper and multiplier in the university context. Beyond that, this position can be used to build bridges between the university and high-ranking personnel from public administration, politics, and industry. On a scientific level, the scientific chair's function is to evaluate project proposals and steer them so that they are manageable and viable. Thus, the position of the scientific chair combines the initiative's knowledge-brokering and boundary-spanning functions. The executive director, a position held by a scientifically trained, mid-level university employee, develops project ideas or organizes working groups and takes managerial steps toward realizing them. A strategic council—comprising members of different organizations from the scientific, public administration, economic, and civil-society spheres—meets regularly, currently once a year, to discuss strategy questions for the following year. The scientific chair, the executive director, and the strategic council coordinate Bielefeld 2000plus' activities and inform each other on ongoing processes. The division of labor among these positions allows the executive director to work independently with some experienced oversight. He or she is the

Fig. 1 Shows the BFI model and the relationship between the actors involved, using the example of one working group

most actively employed part of the intermediary, eliciting new ideas and managing the maintenance of running ones with the support of a secretary or a (student) assistant. This structure's long-term functionality is highly dependent on the people holding relevant positions as individuals. The success of the scientific-chair position is particularly dependent on the ability to maintain sustainable relationships with people in leading positions, both in the university and in the city in general. These must be developed over time, which makes formalization of the processes involved, including replacement, challenging. Furthermore, this structure can be dependent on the personal motivations of the individual holding the position, if he or she is not formally employed as a scientific chair of the initiative, but as a university professor.

The second characteristic is the intermediary's *networks*. Apart from finances, an intermediary's most important resources are trust and credibility, which are the basis for building networks. The networks are the basis for active working groups, which are responsible for carrying out projects, such as the cases described below, and passive contacts that can be reactivated for future projects. They are acquired either through the scientific chair and executive director's professional relationships, or have been part of a project in the past and might be interested in participating in another one. Basing the initiative at the university is a functional starting point to build networks. The university, as an organization with a certain reputation, grants credibility toward people who are unfamiliar with the intermediary and already are part of the city's networks that exist for other purposes. As can be seen in the case of the "Inner City Conference" (see below), being part of networks of this kind alone provides actors with legitimacy, which can stifle the efficacy of the work done by others, especially when powerful actors from public administration or political spheres are involved.

The third characteristic is the *working procedures* in working groups, built on networks in the city and/or within the university. The working groups typically comprise citizens from different backgrounds who represent scientific, public-administration, and local economic spheres. Members of working groups can be divided into two

subcategories: boundary spanners and members of civil society, i.e., members who participate in their boundary-spanning functions as assigned to them by an organization associated with the triple helix and those who have no formal role to play but participate primarily as citizens or as members of NGOs.[9] Those members are the minority in most working groups, but through their extraordinary commitment to solving the issues at hand and their experience, they exert a large impact on working processes. Members of the civil society may be former employees of one of the helices or may be organized in NGOs. They can, for instance, be retired scientific personnel from the university who are familiar with scientific working procedures and the university's structure yet still maintain valuable and purposeful relationships with current scientific personnel. Thus, members of civil society either are former members of organizations from the political, economic, or scientific sphere or are involved in NGO activities. Since the working groups are not visible to the general public, an individual will not be able to participate without some connection to a relevant organization. Typically, people in the working groups display personal engagement and motivation to participate in the city in their areas of expertise. They identify with their city and, therefore, are willing to sacrifice some of their free time to support the intermediary's projects. This dependence on personal motivation also holds risks. Like the scientific chair, personal motivation cannot be formalized and, therefore, tends to be unpredictable and difficult to control. Depending on the working group and its members, after some time, they ideally run independently, assign a speaker, and develop their own projects.

The following three projects will show how and under what conditions the BFI model can be realized. These examples can help evaluate the model regarding its strengths and weaknesses. The first project demonstrates the challenges of keeping many people included in a project without yielding immediate visible results. It worked with a long-ranging time frame and was meant to produce a vision and guidelines for the long term. Thus, cooperation and motivation could not be taken for granted because of expected beneficial outcomes. However, it did elicit a long-term effect in building networks and institutionalizing exchange that had happened only sporadically before. In that sense, it can serve as an example of boundary spanning and knowledge brokering because the boundary-spanning activities of all organizations involved were transformed into meeting regularly to exchange knowledge about the issues at hand. The second project attempted to specify challenges and apply recommendations in practice. Here, the possible problems of institutional change are shown when concrete results are expected beyond boundary spanning and knowledge brokering. However, it can serve as an indicator for the developments of knowledge society, as it temporarily resulted in a politically established think tank whose sole purpose was knowledge production for the city. For the third project, we present a research project conducted by following purely scientific standards; thus, it is the clearest example of knowledge production and brokering because its only goal was to generate data and spread empirical results to support strategic decision-making processes. Nevertheless, it was a product of cooperation and was useful for many actors involved. Here, we demonstrate the possibilities and limitations of an independent project that an intermediary carried out.

Bielefeld 2050

From 2004 through 2007, 40 experts held approximately 40 sessions to develop and formulate a vision for the city of Bielefeld that thoroughly analyzed current trends and developments. The experts came from different professional spheres, i.e., science, economics, local government, regional planning, and management consulting. Eighteen organizations from the Bielefeld region were represented, including several companies, the regional Chamber of Industry and Commerce, a number of NGOs and housing associations, as well as the city of Bielefeld. In a process that spanned roughly 3 years, the Bielefeld 2050 project emerged from an already-existing working group initiated by Bielefeld 2000plus that is dedicated to urban development. The plan was to analyze existing data and interview experts to see where current developments are taking the city in the next few decades and how the city can adapt to them.

The group organized workshops focusing on the topics of "demographics, regional structure, and communal finances," "housing, urban districts, integration, and environment," "social issues and health," "economy and work," "consumption and leisure time," and "education, science, and culture." To accentuate a far-reaching perspective, the year 2050 was set as the project's point of reference.

Several mega-trends were identified in the process, along with suggestions on how to address them. These mega-trends came with a warning that the long time-line should not deter decision makers from taking immediate action. The mega-trends considered were (1) decline of the city's population size; (2) aging of the population; (3) increasing ethnic and cultural diversity; (4) individualization of life challenges and risks; (5) growing importance of environmental provisions; (6) scarcity of fossil-energy sources; (7) globalization of economic relationships; and (8) flexibilization of labor relations.

Possible ways to deal with these mega-trends were formulated while stressing that they do not represent the positions of the organizations involved, but stood for themselves and could be used as a starting point for further discussions, if accepted. This step was important to free the individuals involved of organizational loyalties and vocational restrictions. The independence of the process was crucial in this intermediary work to circumvent problems that arise from bringing society's independently functioning spheres together. This is a practical example of how boundary spanning can work. The individuals represented their organizations, and by engaging in the process, they changed these organizations' boundary-spanning activities. However, they also acted as individual citizens of the city and had no specific agenda to which they needed to adhere. This freedom was a means to circumvent conflicts of interest that these organizations may have in other contexts.[10] While knowledge production is uprooted from its traditional university context in these cooperative activities, it keeps a degree of independence that an impartial intermediary partially grants. The project's results were published in various formats and became an important input for subsequent projects, e.g., a plan for housing development in the city. In addition, several individuals were appointed to oversee the implementation of the project's recommendations in different fields of activity. However, instead of focusing solely on their specific fields, the following quote from meeting minutes shows how scientifically guided cooperation among individuals was the preferred working mode:

> "*Prof. Fischer*[11] *suggests building on the working principles and goals of the* "*Bielefeld 2050*"
> *project and not to work separately on the issues of interest. Instead, it should be tried to*
> *implement an interdisciplinary project that shows how the project develops if all appointed*
> *people of all fields work on them* [the issues] *together. Such a project that includes all fields*
> *would correspond with the spirit of the* "*Bielefeld 2050*" *project to a significant degree.*"

Donations from regional companies financed publication of the results. The executive director and members of the working group presented the project to these companies and collected the donations. The findings also were reviewed positively in regional and national news media.

Bielefeld 2050 shows that long-lasting cooperation can lead to productive projects that make a political impact without needing to adhere to specific political or other agendas. As an intermediary, Bielefeld 2000plus provided room (both literally and figuratively) for open discussions and inquiry, managed the project, and published the results. Thus, Bielefeld 2000plus helped the triple-helix actors to produce knowledge about the city and region that could serve as a basis for making future decisions on policy and business. This transformation of organizations institutionalizing their cooperation and committing to joint knowledge production is the result of Bielefeld 2000plus and all actors involved acting as institutional entrepreneurs.

Future Inner City/Inner City Conference

In 2008, the aforementioned working group for urban development initiated another project that aimed to outline a concept for Bielefeld's inner city. The project was meant, among other things, to be a focused continuation of the work done in the Bielefeld 2050 project. The goal was to balance conflicting interests and consider all factors affecting the positive development of the inner city and to avoid focusing on, for instance, isolated architectural issues. In that vein, the important variables were image and self-conception; appearance and architecture; urban green spaces and public spaces; education, research, and science; industry, trade, business, and services; population and social issues; housing; culture; leisure time, sports, and recreation; infrastructure and traffic; environment and resources; and politics, administration, and citizens. The working group, comprising 18 people from the city administration and the university, as well as companies and economic interest groups, met during an 18-month period. The following quote, taken from minutes of a planning meeting for this new project, illustrates the degree of cooperation from different areas of society and how knowledge transfer and boundary spanning are put into practice within one exchange:

> "*Mr. Meier* [from Housing Association A] *points out that this topic* [the development
> of the inner city] *has partially been elaborated in the context of the* "*Bielefeld 2050*"
> *project and asks about the work of the appointed people responsible for establishing the*
> *implementation of its suggestions. Professor Schulz* [from Bielefeld University] *suggests*
> *that these people should report on their work in the first meeting of the new project and*
> *that material from ongoing projects on inner-city development should be presented. Mr.*
> *Schneider* [Construction Company A] *offers to provide material on construction plans*
> *for Public Place A and transfer it to Bielefeld 2000plus in March. Mr. Schulz* [Housing
> Association B] *offers to use the premises of Housing Association B for the meeting.*"

In three working phases, they (1) analyzed the city as a whole, hearing experts and comparing city rankings; (2) defined the area of interest, including what factors should be used to determine the quality of the inner city, and identified the inner city's weaknesses and potentials, with the support of expert workshops; (3) defined areas of activity with a specific focus and fleshed out respective problems, goals, and measures to improve the current situation. Bielefeld 2000plus published the results.

To address the issues that the project raised, the lord mayor of Bielefeld invited members of the city parliament and members of the working group to act as a recurring "Inner City Conference." The venture received significant attention from local news media. The conference was held about 40 times in subsequent years and became a respected actor that continually published expert opinions and recommendations on how to develop the inner city. This can be viewed as a response to the knowledge society's changing landscape, impacting urban development in the process. However, in 2017, the conference stopped meeting due to a lack of practical responses from the public administration. In particular, the difficulty of changing administrative structures and processes could not be overcome to a significant degree. This points to a conflict between societal spheres that is systematic: Actors from the scientific and economic spheres analyzed different ways in which the city needs to change, while the public-administration and political spheres were satisfied with maintaining the appearance of being open to change without actually implementing it (Bailey et al. 2011). Thus, while institutional change at first existed in initiating the conference and installing a knowledge-producing think tank that involved many different organizations, the change seems to have been superficial. The outcome showed that powerful organizations and institutions can support projects that appear to elicit institutional change without being able to implement the recommendations. In neo-institutional terms, this is an example of decoupling, in which the organizational reality is decoupled from its outward appearance (Meyer and Rowan 1977). This can be viewed as a possible side effect of the knowledge society constituting a new institutional arrangement with new expectations for organizations to gain legitimacy. When cooperation across organizational and institutional boundaries is the condition for an organization to claim legitimacy, yet organizational change is difficult to achieve, a change in appearance is more likely than a change in structure. However, this poses a dilemma for the intermediary because public attention is a medium through which the intermediary can present itself as a legitimate, competent actor worthy of (financial) support and cooperation. Thus, this project's course points to a more general problem that an intermediary like Bielefeld 2000plus itself might encounter. The analysis of modern society as being a knowledge society and all the institutional changes necessary to adapt to this development hold the risk of initiatives and organizations being founded only to show outwardly that the adaptation is happening. Organizations may see this as a "trend" that they need to follow if they want to maintain their legitimacy as actors. This development affects universities in the context of increasing competition. When rankings are published that rate universities on their knowledge-transfer activities, among other criteria, installing an initiative for knowledge transfer may only be window-dressing that does not accomplish much in reality. This project can serve as an example of how public attention can be the source of both legitimacy and failure. A more promising approach may be to work on specific topics without drawing much public attention, including from news media, and only "going public" when concrete results can be provided.

Survey on refugees' educational and vocational background and future aspirations in Bielefeld

In 2015, as a result of the civil war in Syria, numerous refugees migrated to Germany, and many ended up in the Bielefeld region. A Bielefeld 2000plus working group that focused on matters of intercultural living in Bielefeld decided to address this matter. The working group comprised social scientists and members of the public administration, as well as members of advocacy organizations for refugee and migrant interests. A research project was started that interviewed refugees about their job qualifications, educational backgrounds, and aspirations in Germany. The executive director and the corresponding working group constructed a survey. The questionnaire was translated into six languages and conducted online, a decision designed to deal with interviewees' high degree of reluctance to reveal personal information, which was expected because of their precarious legal status in Germany. Furthermore, many refugees were expected to possess smartphones with Internet access to organize their migrations. The survey then was promoted through leaflets and posters handed out in refugee shelters in the Bielefeld region. This process required extensive communication with the shelters' administrations, which welfare organizations concerned with this issue managed for the most part. Bielefeld 2000plus had to carefully handle the subject matter's sensitivity and these residents' vulnerable states to gain their trust and conduct the research according to ethical scientific standards. The executive director and working group members personally met with the shelters' management personnel to explain the process and assure them of Bielefeld 2000plus' credibility and trustworthiness, as well as the legitimacy of the working process. In the end, 312 people participated in the study, leading to interesting results for the university regarding their interest in pursuing or continuing academic careers, or in seeking jobs with the city's labor departments and agencies.

This project approximated a purely scientific study, with the principal difference being the creation of a working group of various organizations. The university supported the project financially, covering printing costs and paying for a research assistant who programmed the online survey and helped with the evaluation. Without additional financial support from the university, it would not have been possible to conduct the project, indicating the aforementioned ideal/typical independence limits. However, the project is a significant example of an intermediary assuming a knowledge-brokering function, as it generated data and published an analysis that was of interest for many actors in the region, including the university itself and companies interested in the potential workforce that the newly arrived migrants represented.

These cases were meant to highlight some of the factors that go into intermediary work and that determine a project's success or failure. These factors can be found at all stages of the process, from the initiating network to the individuals who participate in the working group, the project's circumstances, and media attention. The cases show how intermediary Bielefeld 2000plus engaged in boundary-spanning and knowledge-brokering activities through building and maintaining networks, generating and analyzing data, and publishing the results. Therefore, it is an example of an intermediary acting as an institutional entrepreneur that challenges and changes existing structures on both organizational and knowledge levels. However, the cases also show limitations and risks, e.g., limited financial resources put restrictions on necessary independence, and the legitimizing effect that engaging in cooperative activities holds for organizations in a knowledge society carries the risk of window-dressing.

Results and discussion

The growing importance of knowledge in modern society confronts all societal realms with the need to adapt by intensifying cooperation across boundaries. The idea of the triple helix addresses that challenge by focusing on cooperation among the scientific, governmental, and economic spheres. This paper theoretically derived an intermediary model as an institutional entrepreneur between these triple-helix relationships. By identifying both the need for intermediation, as well as institutional entrepreneurship to establish successful triple-helix cooperation, the paper considered in how far these two roles could be assumed by the same actor. This was particularly promising when focusing not only on technological innovation, but also on urban and regional development, in which planning processes and public administration, as well as civil society, play important roles. A profound evaluation of extant literature led to the conclusion that this actor would need to assume a bifunctional framework that combines boundary-spanning and knowledge-brokering activities. To achieve institutional change, the actor must change other organizations' boundary-spanning activities, produce knowledge, and build network structures that are both stable and flexible simultaneously. The article then confronted these theoretical assumptions with an empirical example of an actor that aims to realize these requirements.

Bielefeld 2000plus is a university-based intermediary with ties to many organizations and individuals from the scientific, public administration, political, and economic spheres. Over the past 20 years, Bielefeld 2000plus worked to establish and maintain triple-helix relationships and has done so in a variety of ways, including building long-lasting networks, conducting research projects, and recommending ways for the city to respond to societal and environmental challenges. The description of this intermediary made it possible to identify three characteristics: a specific structure of division of labor, maintaining a wide network of sustainable relationships, and structuring work processes in working groups with a high degree of independence. These then were arranged into the Bifunctional Intermediary (BFI) model. To demonstrate the conditions under which this model can be implemented and what problems might occur during that process, three projects were presented, each of which shed light on a different aspect of intermediary work. The first project was a cooperative knowledge production regarding the future of Bielefeld that required both boundary spanning and knowledge brokering from Bielefeld 2000plus and that showed the way that all aforementioned characteristics can be observed in a practical example. The second project provides insight into legitimacy as both a requirement and a source of failure for intermediary work. The third project sheds light on the financial dependence of intermediary work in this context and the possibilities of an intermediary's independent knowledge production.

Conclusion

By showcasing three projects in detail, this paper showed what this model's implementation might look like and reflected on the problems that might occur. These analyses' results can be generalized to articulate several problems to address when establishing an intermediary based on the model presented here.

To assure a high degree of flexibility when reacting to societal developments, *a wide range of relationships and networks should be maintained.* These relationships should involve a significant degree of trust built through personal communication and visible support from trustworthy organizations and institutions (e.g., universities, political groups).

To generate and ensure trust, the intermediary must *establish its name as a well-known and trusted brand in the city*. For this purpose, media attention is a useful tool to present results to the public. One risk of too much media attention, however, is the legitimizing effect participation in these projects can promise organizations (as seen in the example of the Inner City Conference). Thus, the intermediary should try to generate a sense of obligation among the cooperation partners, not only to be part of a network pro forma, but also to work and contribute to the process actively.

Since intermediary work largely is built on networks, cooperation, and individuals' engagement, the intermediary sometimes faces a certain powerlessness. It can try to steer the work in different directions and exert influence through know-how and by proposing ideas, but it is always dependent on its cooperation partners. This underlines the importance of open communication when different interests are involved and need to be mediated without the use of power. *The disruptive force necessary for bringing about change thus has to be applied by cooperative means.*

When public administration is involved, the risks of violating boundary-spanning roles and rules are greater than in other organizations. Decision processes are regulated strictly and are difficult, or even impossible, to change from the outside for obvious reasons. Therefore, personnel from *public administration can most effectively be involved from the beginning of a project or in conceptual work in adapting to large-scale societal developments so that no interference with ongoing decision processes exists.*

Therefore, political neutrality is crucial in intermediary work. Sustainable relationships should be maintained to both individuals and to the positions they hold (e.g., the city's mayor). *To establish long-lasting networks, cooperation must be continued in–and independent from—a changing political landscape—*e.g., *a new lord mayor from a different party taking office.* However, this also means avoiding politically controversial topics and projects as often as possible.

For an intermediary to exist over a long period of time, *a scientific chair who oversees long-term development and maintains relationships is important.* Most of the intermediary's work depends on experience, personal ties, and presenting an image of stability. Transferring these attributes to new personnel takes time and resources, and cannot be done too frequently.

Finally, future research could focus on identifying success factors in intermediary work. In this paper, we presented one example of intermediary work that can point toward problems that need to be addressed. A systematic comparison on the basis of empirical research on intermediary practitioners can help generalize what is necessary for successful triple-helix intermediation.

Following Todeva (2013), further insights into the different roles that an intermediary must fill can be useful. As this paper has identified different functions that an intermediary must assume, the possible conflicts between them are an interesting point of inquiry with which to analyze the inner conflicts of intermediary work.

In analyzing intermediary work done by individuals, Frølund and Ziethen (2016) have focused on the wisdom that this work requires. Intermediaries, as organizational actors, need a higher degree of formalization to establish a working cooperation, as well as wisdom to function properly. Research on intermediaries can focus on the possibilities of institutionalizing this wisdom in an organizational context.

Endnotes

[1]This term is relevant in this context because it describes economic innovation that resembles innovation and change in other social contexts. *Destruction*, albeit a dramatic term, refers to the need for a changing system to leave elements behind to establish new ones. In the context of institutions and organizations, and their relationship with knowledge in general, this phenomenon ranges from installing new departments and hiring new personnel, to confronting existing personnel with challenges to their traditional ways of fulfilling their roles.

[2]The terms explicit and tacit do not refer to knowledge forms that different people hold, or knowledge forms that can be associated with different social spheres, but rather different layers of knowledge that can go beyond what an organization formally recognizes.

[3]See also Caloffi et al. (2015), who similarly identify different "features of intermediaries," including "facilitating relationships between organizations" and "facilitat[ing] and coordinat[ing] information flows between them."

[4]The discussion papers primarily serve as an opportunity for local scientists to present scientific work with a focus on Bielefeld and the region.

[5]See the discussion section for a detailed reflection on possible problems and conflicts.

[6]Industry became involved later through the regional Chamber of Industry and Commerce's participation in several projects and individual companies' financial donations to support publication or the temporary hiring of personnel for specific nonprofit projects. See the presented case studies for more details.

[7]For an entity to become a brand, certain criteria must be met that are difficult to achieve for a non-commercial institution (see Sesselmann 2016; Aaker 1992; Keller 1993)

[8]However, it does check for ethical tenability and other necessary restrictions on scientific freedom.

[9]Here, we follow the definition of Arato and Cohen (1997; emphasis added), who define civil society as "a sphere of social interaction between economy and state, composed, above all, of the intimate sphere (especially the family), *the sphere of associations (especially voluntary associations), social movements, and forms of public communication.*"

[10]Perrone et al. (2003) show that trust put in boundary-spanning personnel depends on the degree of autonomy that the organization grants these personnel to fulfill their roles.

[11]All the names used in the cited minutes have been changed to guarantee participants'anonymity.

Additional file

> **Additional file 1:** Translation of the abstract into Arabic. (PDF 47 kb)

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