

KEY INSIGHTS



BIOTEXFUTURE⁷
TRANSITION LAB

COLLABORATION IN THE INNOVATION SPACE: INSIGHTS FROM BIOTEXFUTURE AND BIOBALL

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SONA – 05.2024

1. BIOTEXFUTURE & BIOBALL

Aim and structure

2. INNOVATION COLLABORATION

Knowledge exchange across project boundaries

3. SIMILARITIES AND DIFFERENCES

What the innovation spaces can learn from each other

BIOTEXFUTURE

Vision and aim

BIOTEXFUTURE⁷

- **Vision.** Transform the textile value chain from petroleum-based to bio-based.
- **Aim.** Driving innovation to convert the textile value chain from petroleum-based to bio-based. To enable radical and lasting change, BIOTEXFUTURE focuses on interdisciplinary research alongside the whole textile value chain.
- **Projects.** The projects pursue, among other things algae-derived biopolymers, bio-based textile finishes, chemical recycling of bio-based polyamides, commercially viable elastic filament yarns made from CO₂-containing TPU or bio-based and biodegradable nonwovens for agricultural applications.

BIOBALL

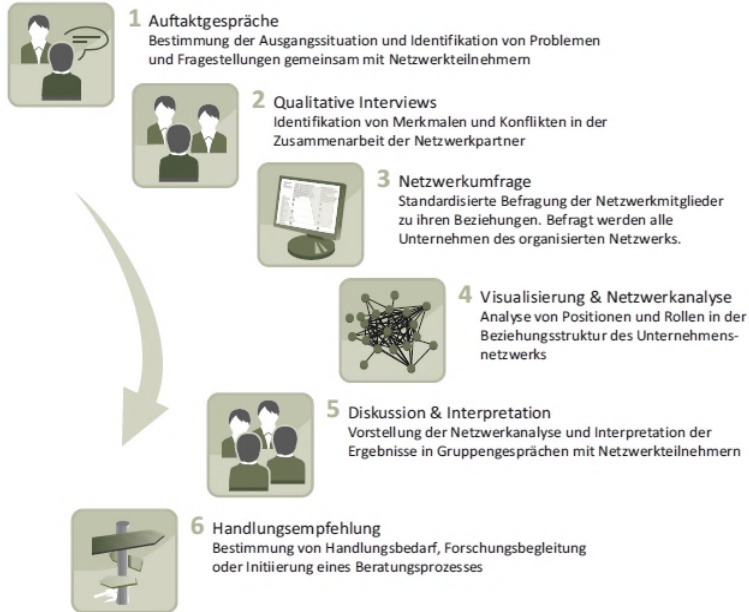
Vision and aim



- **Vision.** Structural change towards a sustainable, bio-based economy under the special conditions of a densely populated and industrialized metropolitan region.
- **Aim.** To develop and establish new recycling routes for biogenic residual and waste materials, and thus create a model region for a sustainable, bio-based economy.
- **Projects.** The projects pursue, among other things insect-based sustainable aquaculture, PHA biopolymers from CO₂ for packaging materials, customized animal feed for sustainable nutrition, utilizing agricultural residues and side streams from viticulture and other regional agricultural processes.

SONA SURVEY

Aims and methods



- **Aims.** We aim to capture and analyze the network and quality of innovation collaboration in the Bioeconomy innovation spaces.
- **Methods.** SONA is a mixed-methods approach to studying innovation collaboration in organizational networks (Glückler & Hammer, 2011).
- SONA contributes to enhancing collaboration (Glückler et al., 2020):
 - **Sensitization and activation**
 - **Diagnosis and opportunities**
 - **Theory and recommendations**

SONA SURVEY

Aims and methods

BIOTEXFUTURE

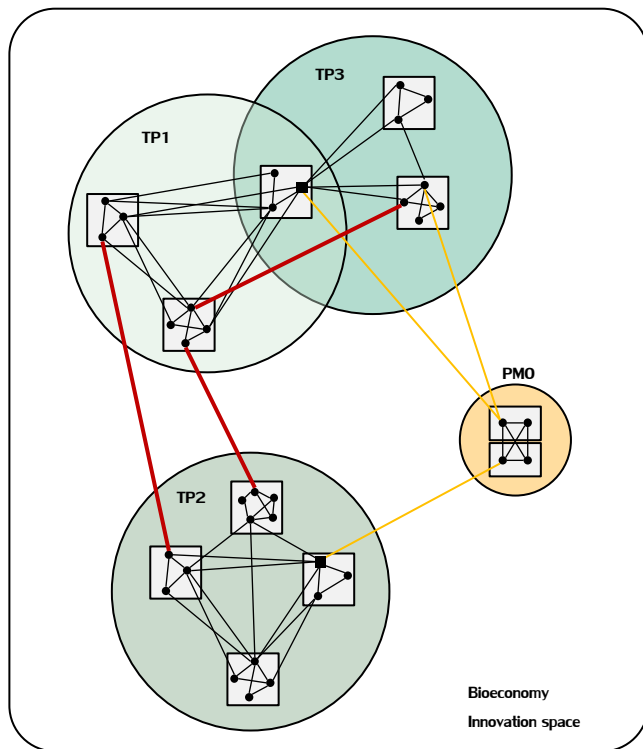
- **Interviews.** We conducted 14 semi-structured interviews with project leaders from all projects (Dec 2022) and all PMO members as part of the first SONA panel. These interviews helped devise the questionnaire for the network survey.
- **Survey.** We invited all members of the innovation space via email to respond to the survey during the time between 09 Dec 2022 and 28 Feb 2023.
- The questionnaire contained 7 sets of items with a total of 17 questions. 64 members (response rate: 86%) completed the questionnaire.

BioBall

- **Interviews.** We conducted 7 semi-structured interviews with project leaders (Oct - Nov 2023) and members of the coordination as part of the first SONA panel. These interviews helped devise the questionnaire for the network survey.
- **Survey.** We invited all members of the innovation space via email to respond to the survey during the time between 14 Mar 2024 and 02 May 2024.
- The questionnaire contained 8 sets of items with a total of 16 questions. 48 members (response rate: 70%) completed the questionnaire.

INNOVATION COLLABORATION

A generic model of network relations in a Bioeconomy Innovation space



We distinguish three types of ties:

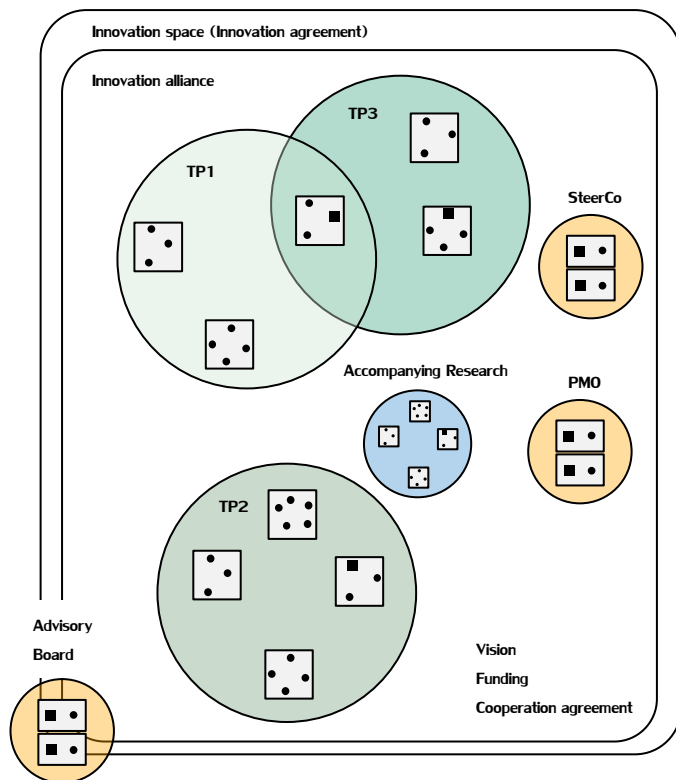
- Type-1: Intra-project relations
- **Type-2:** PMO-project relations (e.g., SPOC)
- **Type-3:** Inter-project relations

Research questions:

- **Magnitude** and **structure** of type-3 ties?
- **Effects** of type-3 ties
- **Drivers** of type-3 ties, including
 - (i) *endogenous*, e.g. work, referrals by peers
 - (ii) *events*, e.g. organized serendipity, cross-project events (Members Day, Forum, etc.)
 - (iii) *governance*, e.g. PMO induced contacts

INNOVATION COLLABORATION

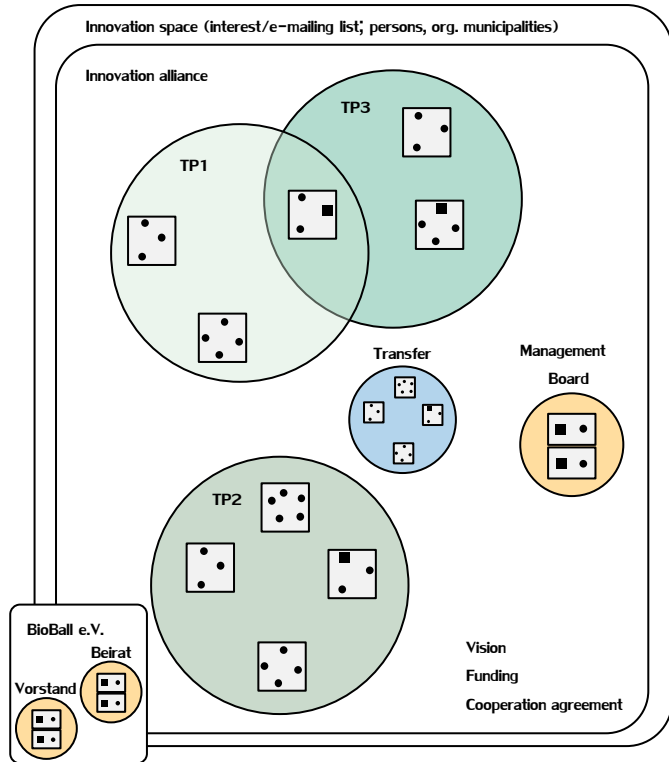
Structural components of the BIOTEXFUTREE innovation space



- **Legal Framework.** Innovation agreement (complete innovation space) & cooperation agreement (each project)
- **Number of projects.** At the time of the survey, 9 projects were active in the innovation area.
- **Structural components.** Technical projects; Project Management Office; accompanying research; Steering Committee; Advisory Board.
- **Accompanying Research.** A project made up of social scientists; each organization has its own goals and relies on interaction with the technical projects.
- The projects and their organizations must be based in Germany; the project language is English.

INNOVATION COLLABORATION

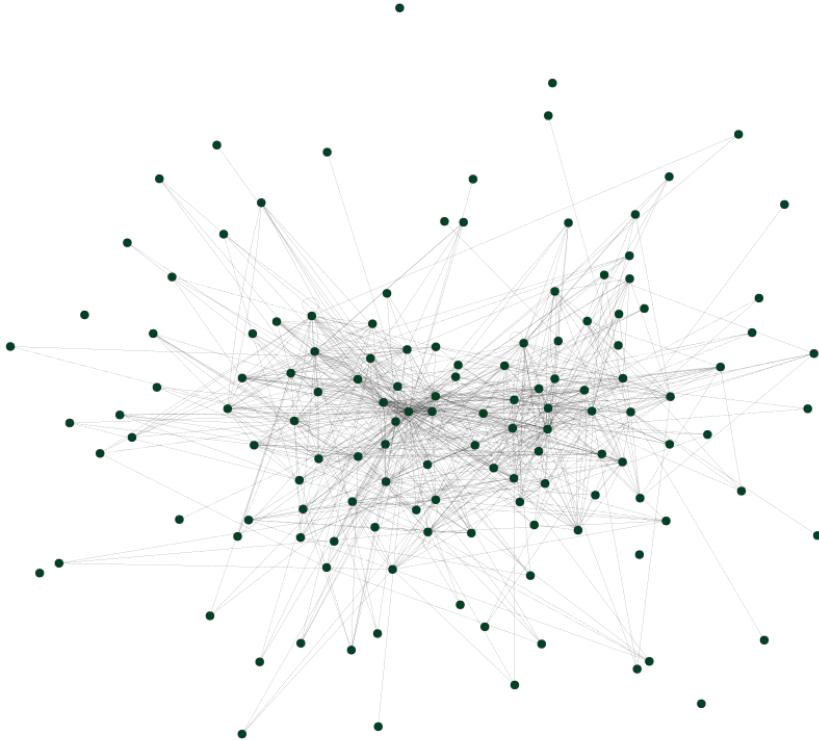
Structural components of the BioBall innovation space



- **Legal Framework.** Cooperation agreement (each project)
- **Number of projects.** At the time of the survey, 13 projects were active in the innovation area.
- **Structural components.** Technical projects; Board; project for technological transfer; BioBall e.V. Management Board & Advisory Board.
- **Accompanying Research.** A project without social scientists; deals for example with technological transfer via LCA.
- Value creation must be realized in the Frankfurt/Rhein-Main-Metropolitan; German is project language.

BIOTEXFUTURE: WHO YOU HAVE LEARNED FROM

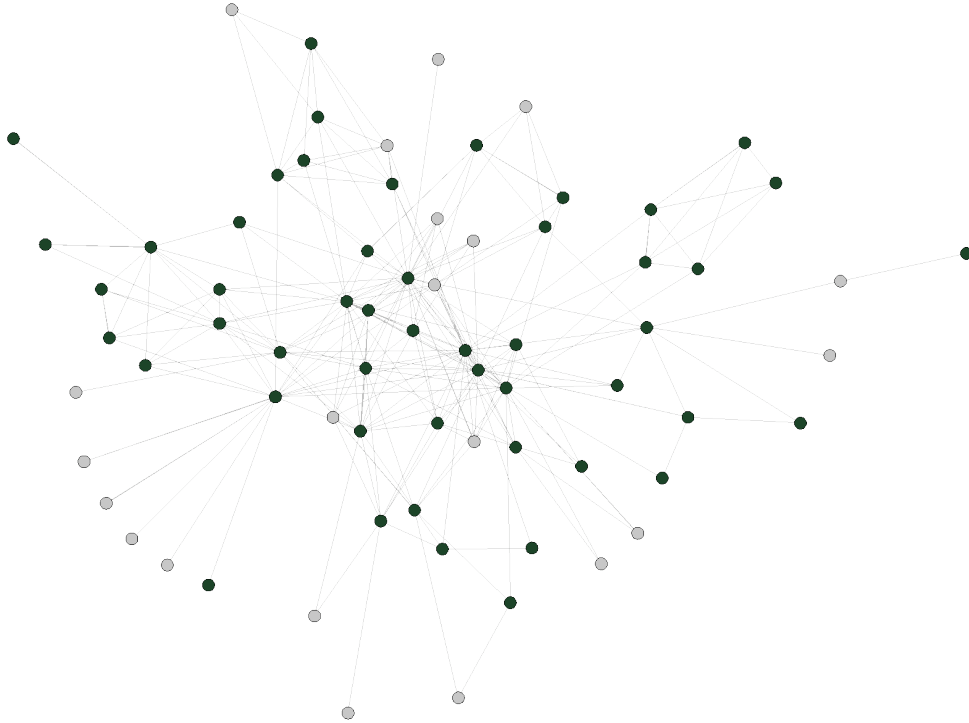
Who are the individuals who have helped you solve problems or build new knowledge and understanding in your project?



- The 65 respondents reported 800 learning relations, with 8 members being disconnected from the learning network (isolates).
- We found 531 ties among the respondents (density = .126).
- The number of people that a member acknowledged for receiving help ranges from 0 to 79, with an average degree of 6.20.
- The number of acknowledgements that a person received for providing help ranges from 0 to 26, with an average degree of 6.20.

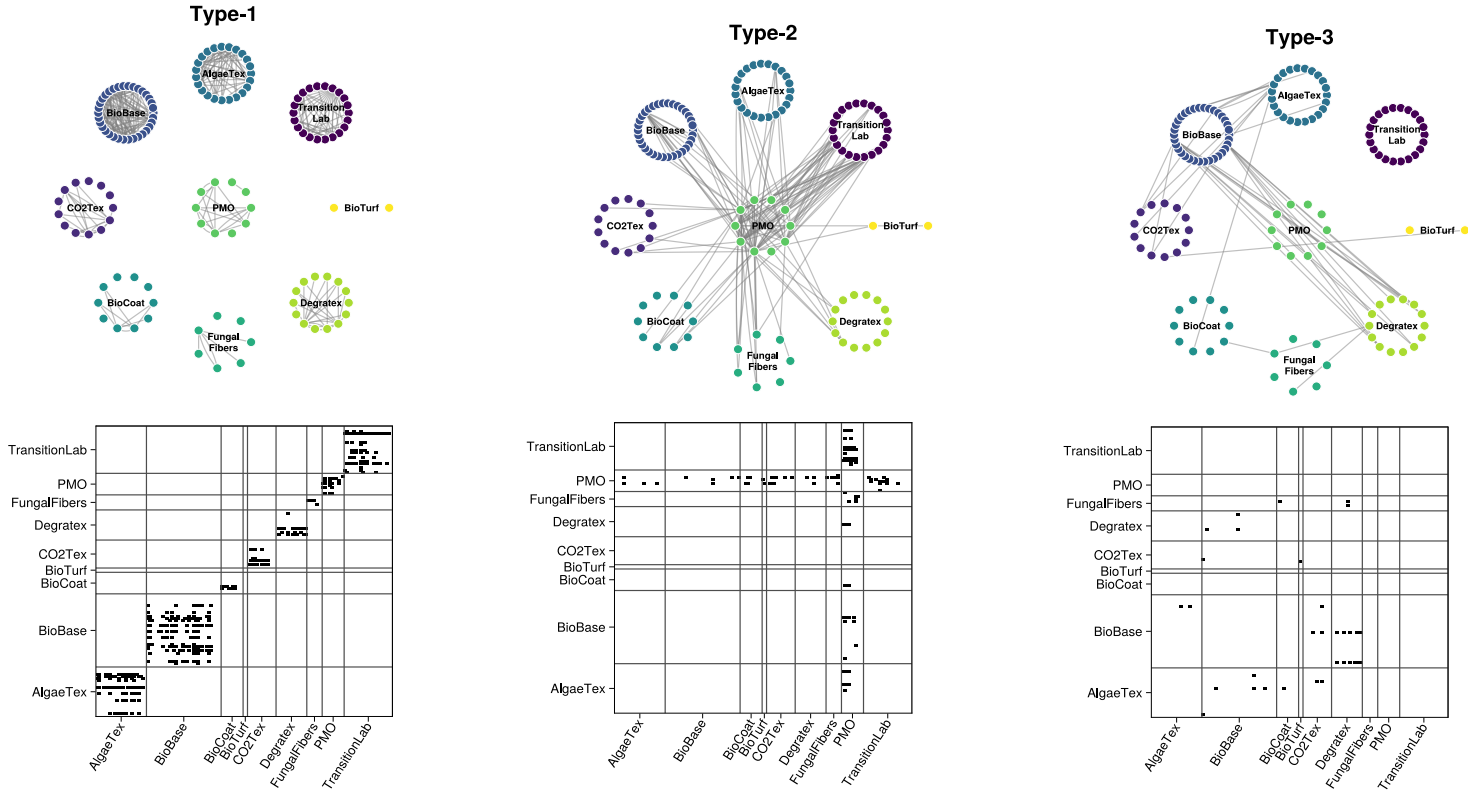
BIOBALL: WHO YOU HAVE LEARNED FROM

Who are the individuals who have helped you solve problems or build new knowledge and understanding in your project?

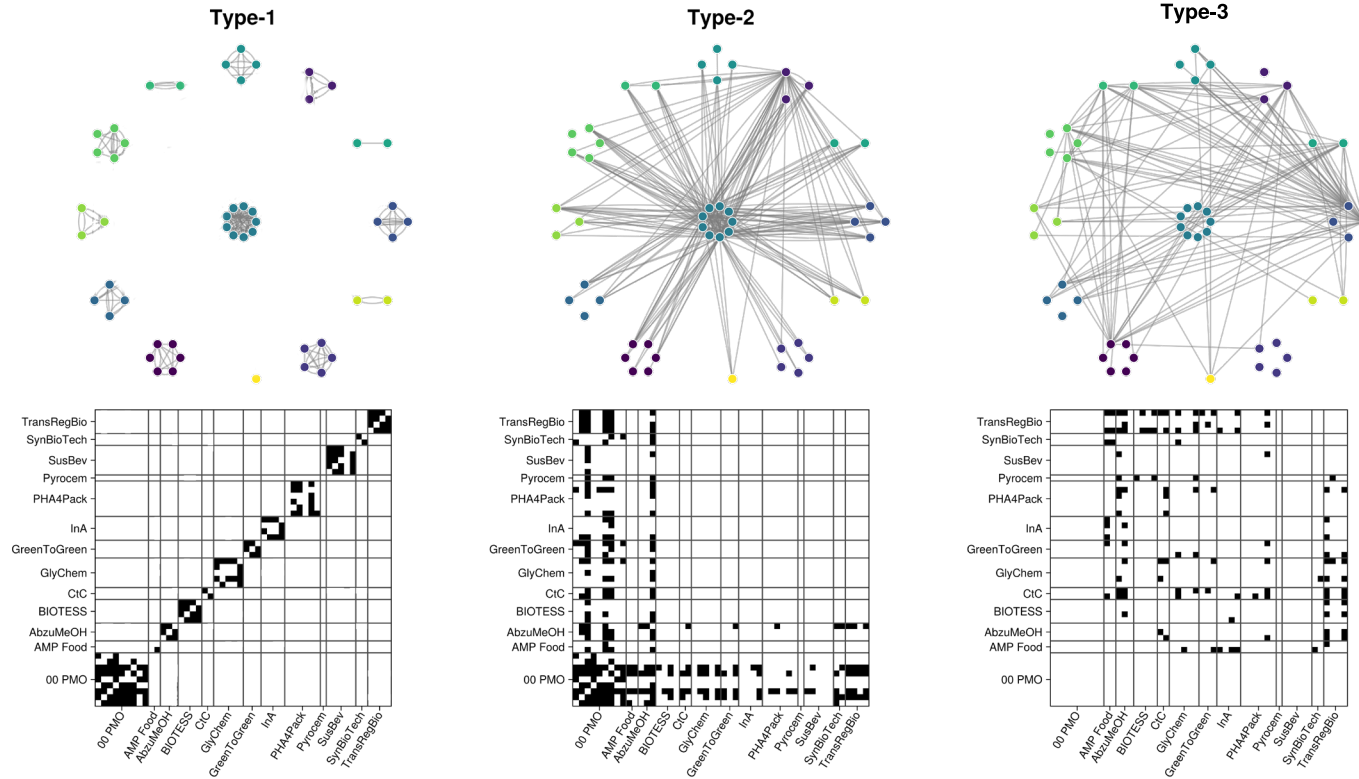


- The 50 respondents reported 291 learning relations, with 0 members being disconnected from the learning network (isolates).
- We found 214 ties among the respondents (density = .11).
- The number of people that a member acknowledged for receiving help ranges from 2 to 33, with an average degree of 9.84.
- The number of acknowledgements that a person received for providing help ranges from 0 to 18, with an average degree of 9.84.

KNOWLEDGE SHARING NETWORK: BIOTEXFUTURE

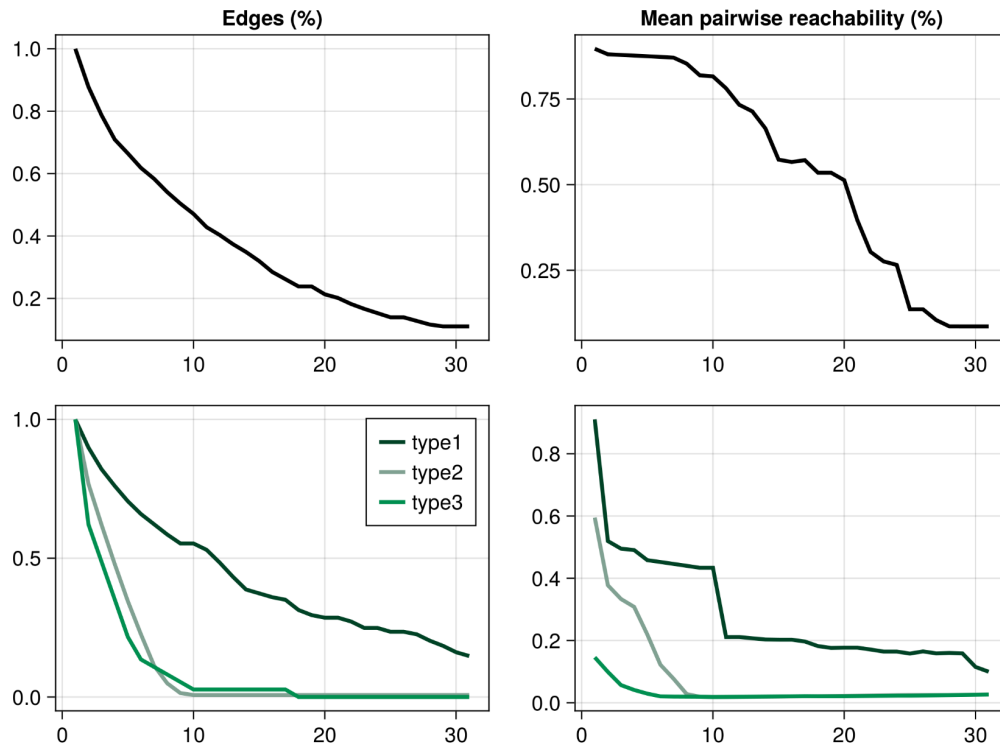


KNOWLEDGE SHARING NETWORK: BIOBALL



ROBUSTNESS

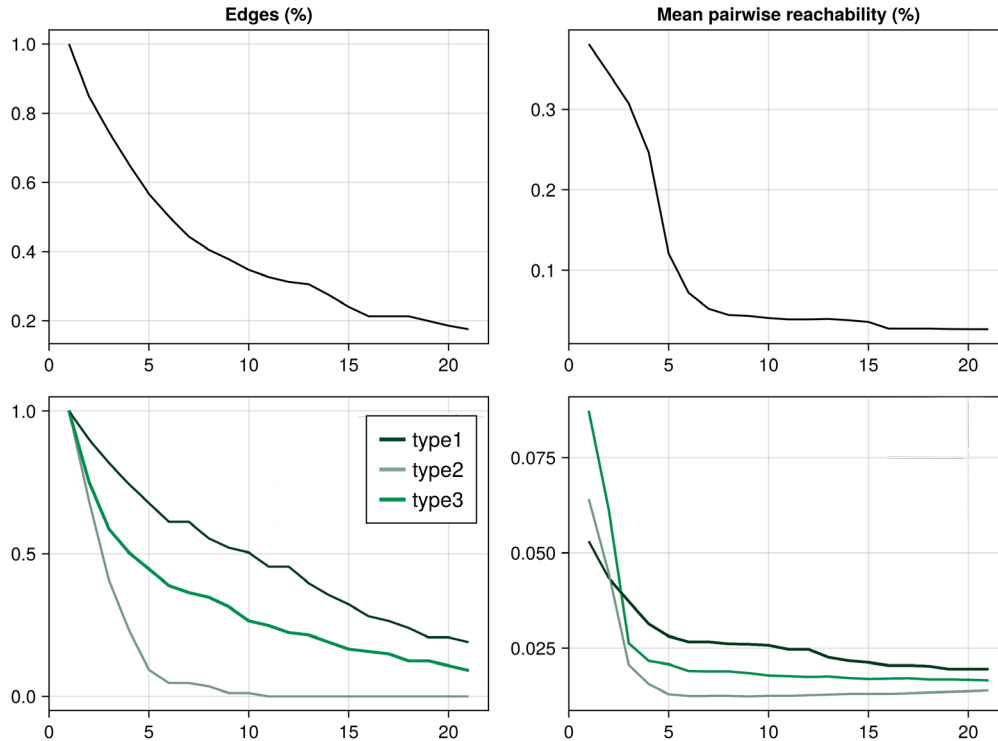
BIOTEXFUTURE



- Taking into account all relationships, it appears as if despite the disappearance of 10 people the network is still strongly connected.
- However, after removing the 8 nodes with the largest network (degree), neither type 2 nor type 3 relationships remain.

ROBUSTNESS

BioBall



- Taking into account all relationships, it appears as if despite the disappearance of 7 people the network is still strongly connected.
- However, after removing the 15 nodes with the largest network (degree), both type 2 and type 3 relationships remain.

MULTIPLE AFFILIATION

Average Degree centrality of the Knowledge Sharing Network

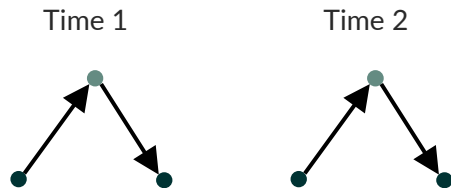
∅ Degree centralities	Works in one project	Works in several projects
BIOTEXFUTURE		
Degree	12,10	14,02
In-degree	6,20	6,15
Out-degree	5,80	7,89
BioBall		
Degree	7,44	11,91
In-degree	3,38	7,58
Out-degree	4,05	4,33

- 19 people in BIOTEXFUTURE work on several projects (2-5) at the same time. 2 people are in both the PMO and other projects.
- 17 people in BioBall work in several projects (2-4) at the same time. 3 people are simultaneously in technical projects and part of the coordination.
- On average, people working in several projects have more knowledge exchange.
- In BIOTEXFUTURE, people in several projects share more knowledge (reference to representative brokerage)
- In BioBall, people in several projects receive more knowledge than they pass on (indication of gatekeeper brokerage)

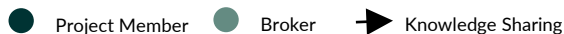
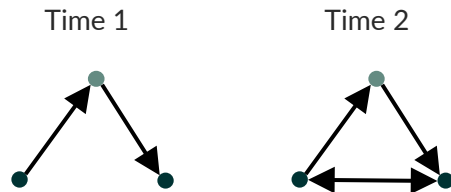
BROKER BEHAVIOR

Tertius gaudens vs. tertius iungens

Tertius gaudens



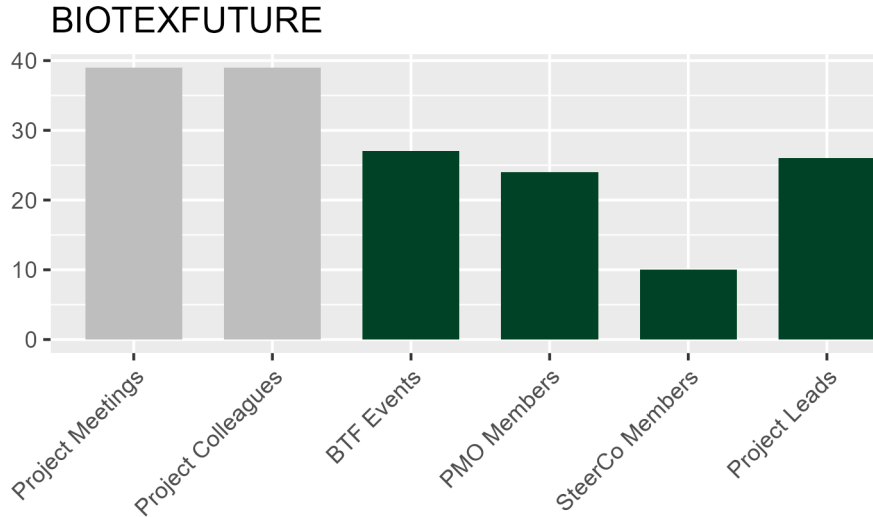
Tertius iungens



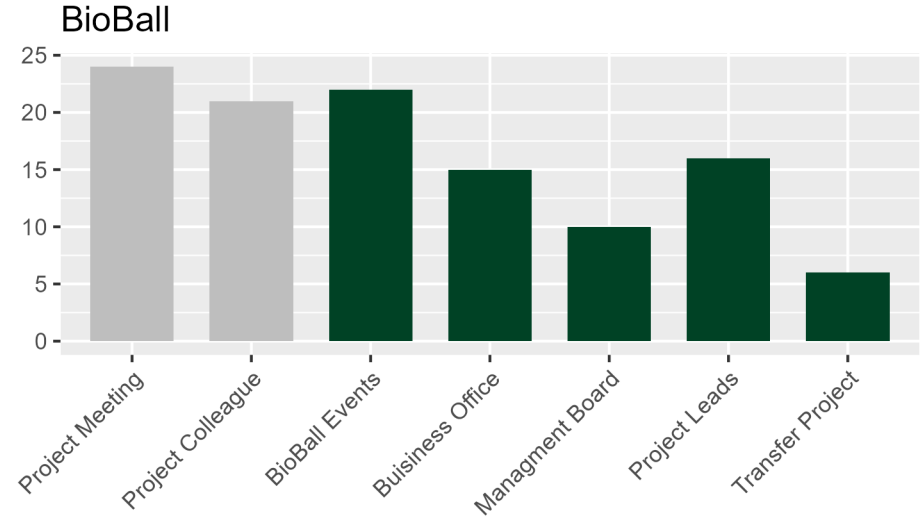
- The structure of the knowledge network or the position of the broker does not in itself determine any action, but only offers opportunities for action.
- *Tertius Gaudens*. The broker exploits the structural opportunity of brokerage to gain information advantages over their peers and privatizes this gain to their own advantage. Tertius Gaudens strategies are helpful in gathering innovative knowledge, spotting entrepreneurial opportunities and pursuing more rapid careers (Burt 2004).
- *Tertius Iungens*. Brokers act as match makers by connecting previously disconnected people. Brokers create and share the benefit of structural opportunities collectively and help the collective efforts to flourish. Successful Tertius Iungens strategies not only enable collective action for innovation but also open new positions of structural holes (Obstfeld 2005).

DRIVERS OF LEARNING

Have you made new work-related contacts through any of the following opportunities?



- In BIOTEXFUTURE, project governance (dark green) is the most important driving force for networking, as it has created 87 (52,73%) new contact opportunities.



- In BioBall, project governance (dark green) is the most important driving force for networking, as it has created 69 (60,53%) new contact opportunities.

CONCLUSIONS



- Both innovation spaces have managed to establish a dense knowledge network in the innovation spaces. However, in both innovation spaces, the type - 3 relationships are distributed among a small number of people.
- **Existing structures.** People who work in several projects play an important role in maintaining the knowledge network in both innovation spaces. This position demands a lot from the members. These brokers can be supported by a good working atmosphere and sensitization - a conscious decision to foster networking and promote synergies and innovation.
- **Striving for synergies.** Governance activities such as matchmaking and events are well received in both innovation areas and lead to new contacts and intensify collaboration. The events play an even more important role in BioBall than in BIOTEXFUTURE. This is examined in more detail in the following analyses.

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Please reach out for full report,
feedback and questions to

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