Service Research Compass 2027

User Guide & Documentation

KAIST College of Business & ASU W. P. Carey School of Business

2025

1. System Overview

1.1 What is Service Research Compass 2027?

Service Research Compass 2027 is a specialized dashboard for analyzing and predicting emerging research priorities in the service research field. By constructing co-occurrence networks from service research journal papers and applying link prediction models, the AI model forecasts which concept pairs are likely to be connected by 2027.

Purpose

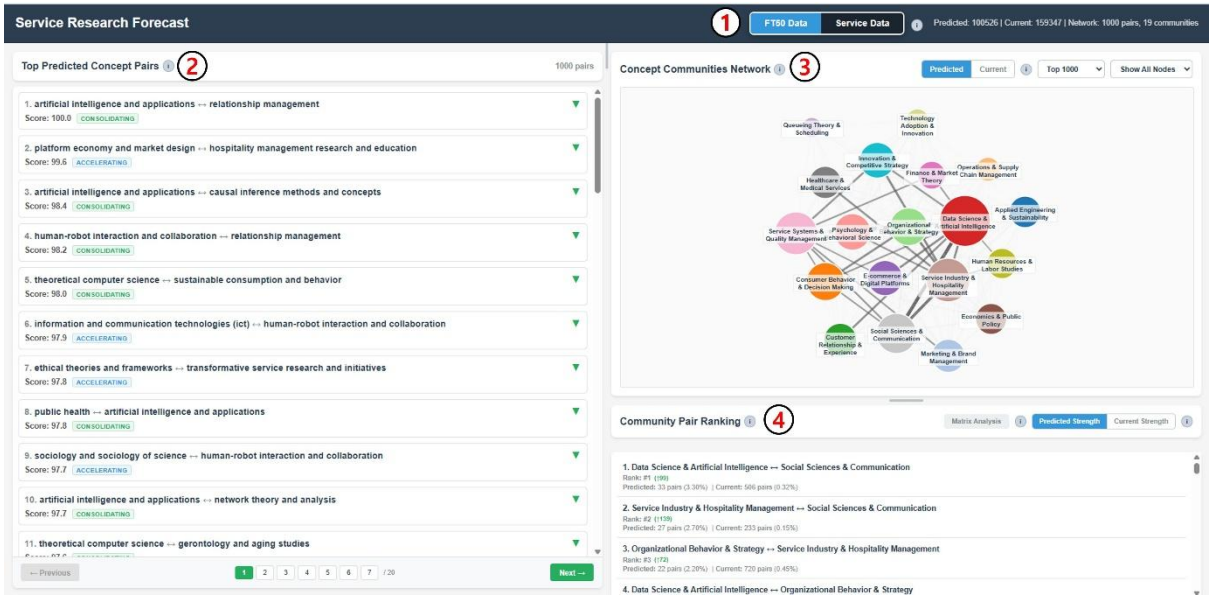
Predict concept relationships in service research that are likely to emerge by 2027, helping researchers identify promising research directions and emerging interdisciplinary connections.

Data Sources

- **FT50 Data:** 5,892 Service research papers from Financial Times Top 50 journals and 799 papers from JSR
- **Service Data:** 11,170 papers from Top 8 Service Research journals

Important: When you click the Data Selection button and switch between datasets, the system displays prediction results that were trained on that specific dataset. Each dataset has its own trained model, so switching datasets shows you different prediction outcomes based on different training data.

1.2 Dashboard Layout



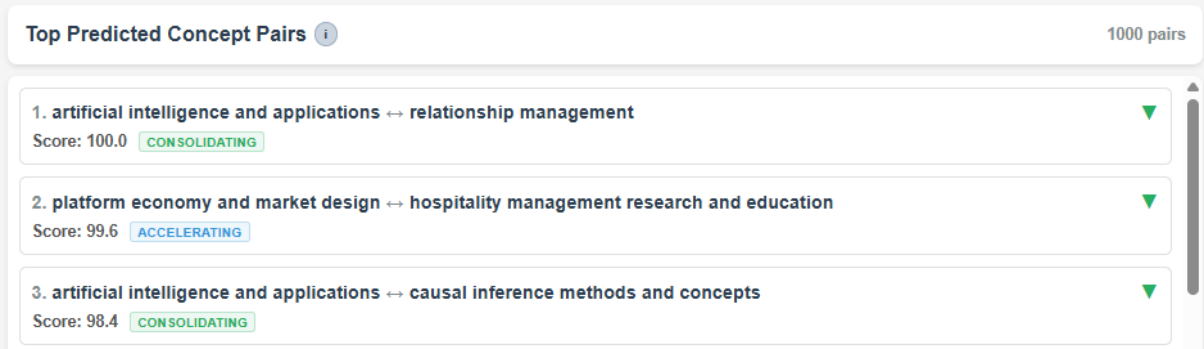
The dashboard is divided into four main areas:

1. **Top Bar:** Dataset selection (FT50 Data / Service Data) - switching between datasets displays results from models trained on each respective dataset
2. **Left Panel:** Top Predicted Concept Pairs list
3. **Right-Top Panel:** Community Network
4. **Right-Bottom Panel:** Community Pair Ranking

2. Top Predicted Concept Pairs

2.1 Overview

This component displays concept pairs ranked by prediction score, showing links likely to emerge by 2027 in service research.



Key Metrics Displayed

- **Rank number**
- **Concept pair (Concept 1 ↔ Concept 2)**
- **Prediction Score (0-100)**
  The score represents the model's prediction probability that has been scaled from the original 0.0-1.0 range to 0-100 for easier interpretation. Higher values indicate greater likelihood of future connection in service research literature.
- **2 by 2 Matrix Category**

2.2 Detailed Information (Click to Expand)

[Insert Screenshot: Expanded Concept Pair with All Details]

When you click on a concept pair, you can see detailed information for each concept:

1. Concept Metadata

- **Paper Count:** Number of distinct service research papers containing this concept
- **Dominant Field:** Primary research field where the concept appears most frequently, shown with percentage (e.g., "Service Innovation (65%)")
- **Community Assignment:** Thematic cluster label generated via K-means clustering and LLM labeling

2. Hierarchical Child Concepts

Child concepts are narrower, more specific terms related to the parent concept. The system displays a hierarchical structure:

- **Child Concepts:** Narrower terms appearing ≥2 times in the corpus

- **Sub-child Concepts:** Third-level hierarchical terms (expandable by clicking ▶)

Example Hierarchy

```
Parent: Service Innovation ├─ Child: Digital Service ▶ │  ├─ Sub-child: Mobile Services │  ├─ Sub-child: Cloud Services │  └─ Sub-child: Platform Services ├─ Child: Customer Experience ├─ Child: Service Design └─ Child: Value Co-creation
```

[Insert Screenshot: Child Concepts Section with Some Expanded]

Purpose of Child Concepts

- Understand concept granularity and specificity
- Identify specific research areas within broader service research concepts
- Explore related terminology and semantic relationships
- Validate relevance and accuracy of concept pairs

3. Concept Community Network

3.1 Overview

The Community Network provides a force-directed graph visualization showing relationships between service research concept communities. It helps identify inter-community connections and emerging trends in the field.

[Insert Screenshot: Predicted Network Full View]

What It Shows

- **Nodes:** Communities (thematic clusters of similar service research concepts)
- **Edges:** Connections between communities
- **Layout:** Force-directed algorithm for natural clustering

3.2 Two Network Views

Predicted Network

Shows future connections predicted by the link prediction model based on historical patterns in service research.

- **Filter Option:** Top N Pairs slider (50-2000)
- Controls how many top-ranked pairs to display (Lower N = clearer view, Higher N = comprehensive)

Current Network

Shows existing connections from training data (2021-2024) based on actual co-occurrence in published service research papers.

- **Filter Option:** Publication Year Range
- Example: 2021-2022, 2023-2024 (enables temporal analysis)

[Insert Screenshot: Side-by-Side Predicted vs Current Networks]

Comparison Insights

- **New connections** (in Predicted, not in Current) = *Emerging trends in service research*
- **Weakened connections** (stronger in Current) = *Declining research areas*
- **Stable connections** (strong in both) = *Core service research relationships*

3.3 Visual Encoding

[Insert Screenshot: Annotated Network with Labels]

Node (Circle) Encoding

- **Size:** Proportional to number of concept pairs in that community (Larger node = more concept pairs)
- **Color:** Unique, consistent color per community
- **Label:** Community name displayed on or near the node

Edge (Link) Encoding

- **Thickness:** Connection strength

Count Mode: Number of concept pairs connecting two communities
Weighted Mode: Sum of prediction scores of all pairs

- **Opacity:** More opaque (darker) edges indicate stronger connections
- **No Edge:** No predicted/current connection between those communities

3.4 Interactive Features

1. Click Node (Single Community Filter)

Filters the concept pairs list to show only pairs involving the selected community. Only that community's concepts are highlighted in color while others remain black.
Use case: "Show me all predicted pairs involving the Service Innovation community"

[Insert Screenshot: Node Click Example]

2. Click Edge (Community Pair Filter)

Filters to show pairs connecting two specific communities. Both communities' concepts are highlighted in their respective colors.
Use case: "Show me connections between Service Innovation and Digital Transformation communities"

[Insert Screenshot: Edge Click Example]

3. Drag Nodes

Click and drag individual nodes to rearrange the layout and untangle complex networks for better visualization.

4. Zoom & Pan

- **Zoom:** Use mouse wheel to zoom in/out
- **Pan:** Click and drag background to move around
- Particularly useful for exploring large, complex networks

4. Community Pair Ranking

4.1 Overview

The Community Pair Ranking component displays an ordered list of community pairs based on their connection strength, helping identify which community combinations have the strongest relationships in service research.

[Insert Screenshot: Community Pair Ranking with Top 10]

Understanding Connection Strength

Connection strength is defined as the number of concept pairs that belong to a community pair.

For example, if Community A is "Service Innovation" and Community B is "Digital Transformation," the connection strength is the count of all concept pairs where one concept belongs to Community A and the other belongs to Community B.

Network Selection

- **Current Network:** When selected, community pairs are ranked by connection strength in the Current Network (based on historical co-occurrence data)
- **Predicted Network:** When selected, community pairs are ranked by connection strength in the Predicted Network (based on link prediction model)

The ranking updates dynamically based on which network view you have selected, allowing you to compare historical vs. predicted community relationships.

Metrics

- **Pair Name:** Community A × Community B
- **Connection Strength:** Number of concept pairs connecting the two communities

Interaction

Click a pair to filter the concept pairs list to show only pairs from that community combination (same as clicking an edge in the network graph).

4.2 Matrix Analysis View

Matrix Analysis provides a 2×2 classification of community pairs based on their predicted vs. current connection strengths using a median-split approach.

[Insert Screenshot: Matrix Analysis View with Four Quadrants]

Four Categories

Category	Predicted	Current	Interpretation
🟢 **Emerging**	High (>median)	Low (≤median)	New opportunities, rising trends
🔴 **Declining**	Low (≤median)	High (>median)	Weakening connections

Category	Predicted	Current	Interpretation
🔵 **Stable-Strong**	High (>median)	High (>median)	Core established relationships
⚪ **Stable-Weak**	Low (≤median)	Low (≤median)	Consistently weak connections

Use Cases

- **Identify emerging research areas:** Focus on the Emerging quadrant to find new interdisciplinary opportunities in service research
- **Spot declining topics:** Review the Declining quadrant to understand which connections are weakening
- **Understand stable core domains:** Examine the Stable-Strong quadrant for established service research foundations

4.3 Matrix Analysis Examples

🔘 Emerging (High Predicted, Low Current)

- "AI & Service Analytics × Sustainability"
- "Platform Economy × Service Ecosystems"

→ *Interpretation:* New interdisciplinary service research connections predicted to strengthen

🔘 Declining (Low Predicted, High Current)

- "Traditional Retail × Physical Service Delivery"

→ *Interpretation:* Service research connections weakening over time

🔘 Stable-Strong (High in Both)

- "Customer Experience × Service Quality"

→ *Interpretation:* Core established service research relationship continuing strong

◯ Stable-Weak (Low in Both)

- "Ancient History × Quantum Computing in Services"

→ *Interpretation:* Consistently unrelated fields

5. Global Controls & Settings

The platform provides several global controls to customize your analysis:

[Insert Screenshot: Control Panel Annotated]

5.1 Dataset Selection

Located in the top bar, allows switching between two service research corpora:

- **FT50 Data:** Service research papers from Financial Times Top 50 journals
- **Service Data:** Alternative service research corpus

Important: When you click to switch datasets, the entire interface updates to show prediction results from a model that was specifically trained on that dataset. Each dataset has its own independent model, so you're comparing predictions from different training sources.

5.2 Edge Weight Mode

Controls how edge thickness is calculated in network visualizations:

- **Count Mode:** Edge thickness = number of concept pairs connecting two communities (better for understanding pair quantity)
- **Weighted Mode:** Edge thickness = sum of prediction scores (better for understanding prediction confidence)

5.3 Top N Filter (Predicted Network Only)

Slider ranging from 50 to 2000 that controls how many top-ranked concept pairs to visualize in the Predicted Network.

- **Lower N:** Clearer, less cluttered view
- **Higher N:** More comprehensive view (may impact performance)

5.4 Year Filter (Current Network Only)

Select publication year range to filter the Current Network (e.g., 2021-2022, 2023-2024). This enables temporal analysis of how service research connections have evolved over time.

6. Recommended Workflows

Here are four recommended workflows for different service research analysis goals:

6.1 Workflow 1: Exploring a Specific Service Research Area

5. Start with the Network Graph (Predicted view)
6. Click on your community of interest (node)
7. Review the filtered concept pairs in the left panel
8. Expand individual pairs to see child concepts and metadata
9. Compare with the Current network to see historical context

6.2 Workflow 2: Identifying Emerging Service Research Trends

10. Go to Community Pair Ranking
11. Click "Matrix Analysis" button
12. Focus on the "Emerging" quadrant (high predicted, low current)
13. Click on pairs in the Emerging category
14. Review specific concept pairs showing this trend

6.3 Workflow 3: Comparing Datasets

15. Start with FT50 Data selected
16. Note the top predicted pairs and network structure
17. Switch to Service Data - this will load results from a different trained model
18. Compare differences in predictions and community relationships
19. Identify dataset-specific trends and common patterns in service research

6.4 Workflow 4: Temporal Analysis

20. Go to Current Network view
21. Filter by 2021-2022 publication years
22. Note connection patterns and strengths in service research
23. Change filter to 2023-2024
24. Compare evolution over time
25. Check Predicted network for future trajectory to 2027

7. Tips & Best Practices

7.1 Do's

- Start with network visualization for big picture understanding of service research landscape
- Use filters to focus analysis on specific areas of interest
- Compare Predicted vs Current networks to identify trends
- Explore child concepts for detailed understanding
- Use Matrix Analysis to categorize relationship types
- Experiment with Count vs Weighted modes for different perspectives
- Adjust Top N based on analysis needs (clarity vs comprehensiveness)

7.2 Don'ts

- Don't rely solely on prediction scores without contextual understanding
- Don't ignore the Current network when interpreting Predicted results
- Don't overlook dominant field information for concept pairs
- Don't forget to check different datasets for robustness (remember: each dataset shows results from a different trained model)
- Don't maximize Top N unnecessarily (can impact performance)

7.3 Pro Tips

- Use node filters (click node) when exploring a single community
- Use edge filters (click edge) when studying specific community pairs
- Child concepts help validate semantic relevance of predicted pairs
- Matrix Analysis is best for strategic trend identification in service research
- Paper count helps assess concept maturity and importance in the field
- When comparing datasets, remember you're comparing predictions from independently trained models

8. Key Terminology Reference

Quick reference guide for important terms used throughout the platform:

Term	Definition
Prediction Score	Model's prediction probability scaled from 0 to 100 (higher = more likely connection by 2027)
Paper Count	Number of distinct service research papers containing the concept
Dominant Field	Primary research field where concept appears most frequently
Community	Thematic cluster of similar concepts (K-means + LLM labeled)
Child Concept	Narrower/more specific term related to parent (≥2 occurrences)
Sub-child Concept	Third-level hierarchical term (expandable)
Connection Strength	Number of concept pairs belonging to a community pair
Count Mode	Edge weight based on number of concept pairs
Weighted Mode	Edge weight based on sum of prediction scores
Matrix Analysis	2×2 classification by predicted vs current connection strength (median-split)
Emerging	High predicted, low current (new opportunities in service research)
Declining	Low predicted, high current (weakening research areas)
Stable-Strong	High in both (core service research relationships)
Stable-Weak	Low in both (consistently unrelated)

For questions or support, please contact:

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