

Webinar ***“How have Digital, Green, and Social Skills Evolved over the past two years? An update on the latest trends and developments in the Tourism and Hospitality Sector”***

Gualtiero Fantoni, University of Pisa

I have been an Associate Professor at the Faculty of Engineering at the University of Pisa since 2014.

My research lies at the intersection of design engineering and data science, focusing on the transformation of technical textual information (patents, standards, product descriptions) into structured quantitative data.

Using natural language processing (NLP), text mining, and, more recently, Large Language Models (LLM), I study product innovation, map emerging technologies, and analyze the impact of digital transformation on skills and the labor market.

I am a founding member of several spin-offs of the University of Pisa, including Erre Quadro s.r.l. (automatic patent analysis), Zerynth (IoT and blockchain for industry), and Beam Me Up (data-driven training).

I am the Director of the Master's Program in "Design Industry 4.0" at the University of Pisa."



The image shows a LinkedIn profile card for Gualtiero Fantoni. At the top, there is a blue banner with the text "Gualtiero Fantoni - Annamaria Natelli - Marcello Braglia" and the title "COSTRUIRE L'IMPRESA INTELLIGENTE" in large white letters. Below the title, it says "L'imprenditore consapevole lo fa meglio" in red and "Prefazione a cura di Massimo Banzi, co-founder di Arduino." in white. To the left of the banner is a circular profile picture of Gualtiero Fantoni, a man with glasses and a light-colored shirt. Below the profile picture, his name "Gualtiero Fantoni" is displayed with a shield icon and "1°". Underneath, it says "Associate Professor at University of Pisa" and "Pisa, Toscana, Italia · [Informazioni di contatto](#)". At the bottom left of the profile section, it says "Più di 500 collegamenti". On the right side of the profile card, there are two logos for the University of Pisa, one in English ("University of Pisa") and one in Italian ("Università di Pisa"). A small bell icon is visible in the top right corner of the profile card.

[Gualtiero Fantoni - LinkedIn](#)

As the founder of Beam Me Up, I'm working on several training and innovation projects for SMEs in the tourism industry.

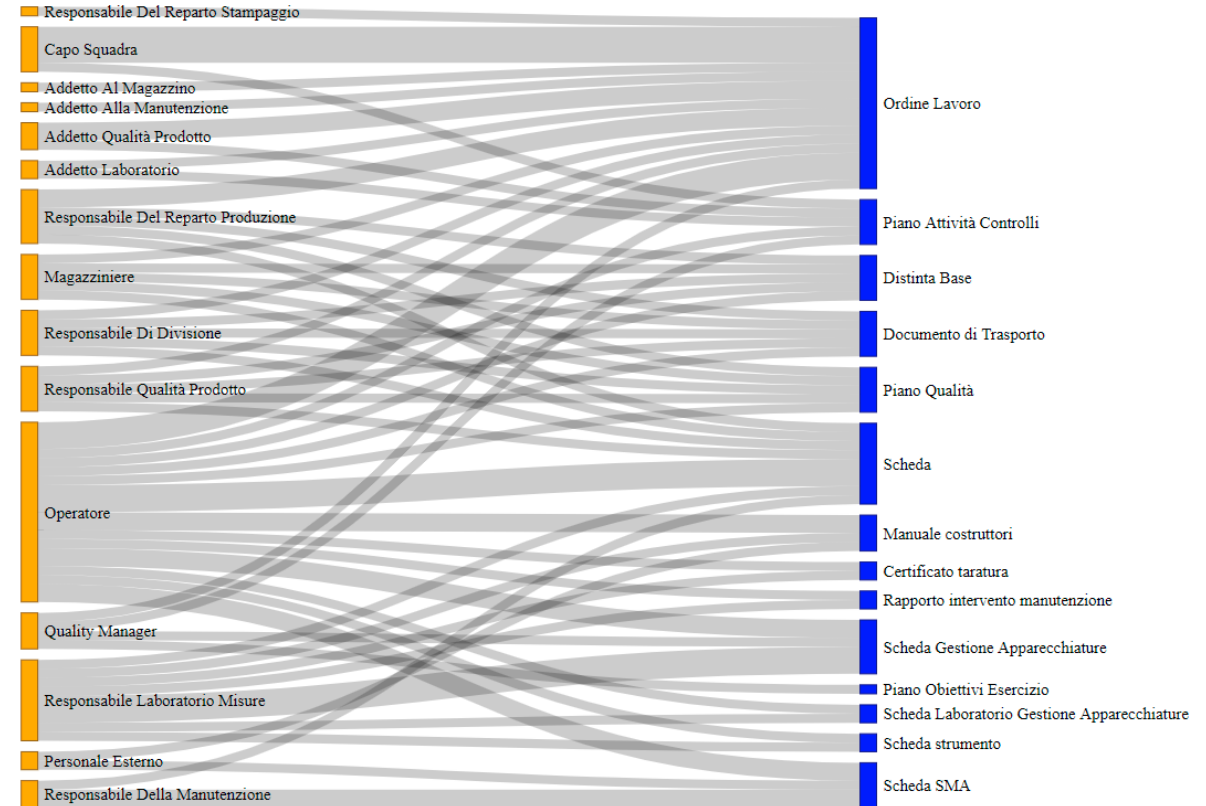
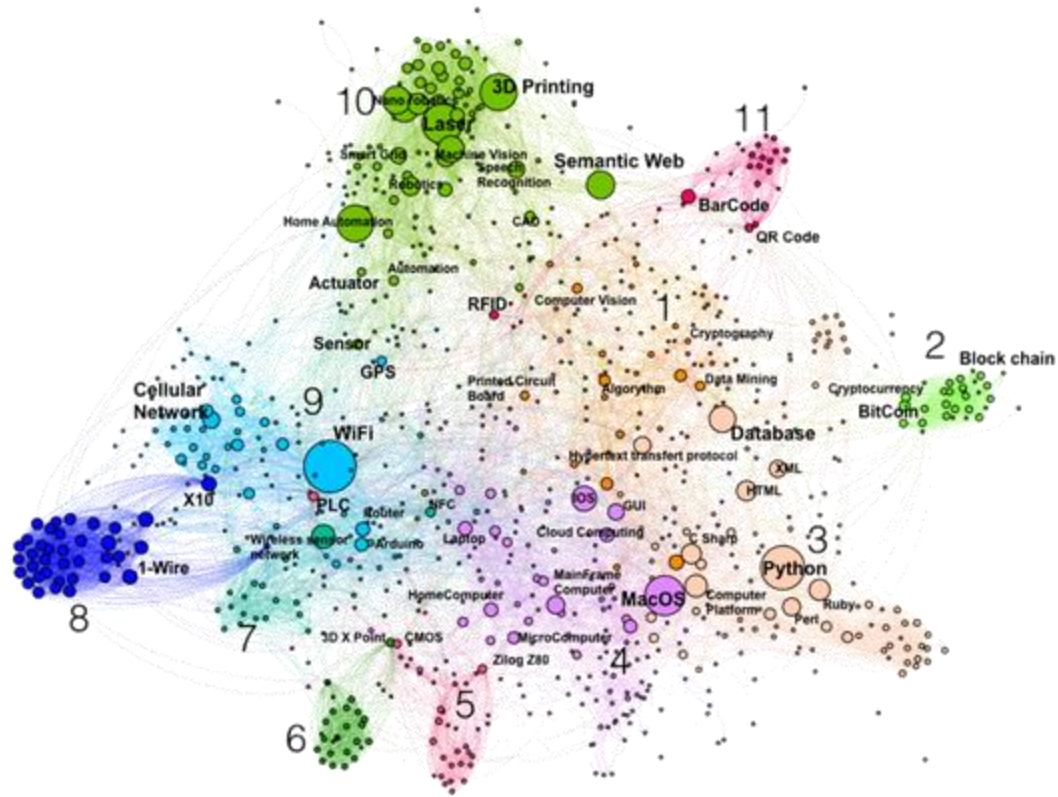
Some projects:

- **"Vetrina 5.0"**: webinars on **AI for food and wine tourism** in Tuscany
- **"Smart Twin Transition"**: a project funded by the Interreg Italy-France-Maritime Program to support the **twin transition** of tourism SMEs
- **"Smart Communitas"**: a project funded by the Interreg Italy-France-Maritime Program to develop **community-based tourism in marginal areas** to attract digital nomads and slow tourists
- **"MarinAI"**: a project funded by the Interreg Italy-France-Maritime Program to develop new tourism connections between the coast and the hinterland thanks to the development of **AI Travel Planners**
- **AI Travel Stylists** for DMCs and Tour Operators

Il progetto **VETRINA 5.0**



Skill at different «grains»



Chiarello, Filippo, Leonello Trivelli, Andrea Bonaccorsi, and Gualtiero Fantoni. "Extracting and mapping industry 4.0 technologies using wikipedia." *Computers in Industry* 100 (2018): 244-257.

Fareri, S., Fantoni, G., Chiarello, F., Coli, E., & Binda, A. (2020). Estimating Industry 4.0 impact on job profiles and skills using text mining. *Computers in industry*, 118, 103222.

Profile and skills analysis (2024)



Scientific literature analysis

Scopus query on Destination Management

TITLE-ABS-KEY ("city marketing" OR "destination marketing" OR "territorial marketing" OR "place branding" OR "place marketing" OR "place promotion" OR "nation branding" OR "region branding" OR "city branding" OR "urban branding" OR "urban marketing" OR "territory manager" OR "tourism marketing" OR "tourism marketing manager" OR "territory marketing")

7,047 scientific articles

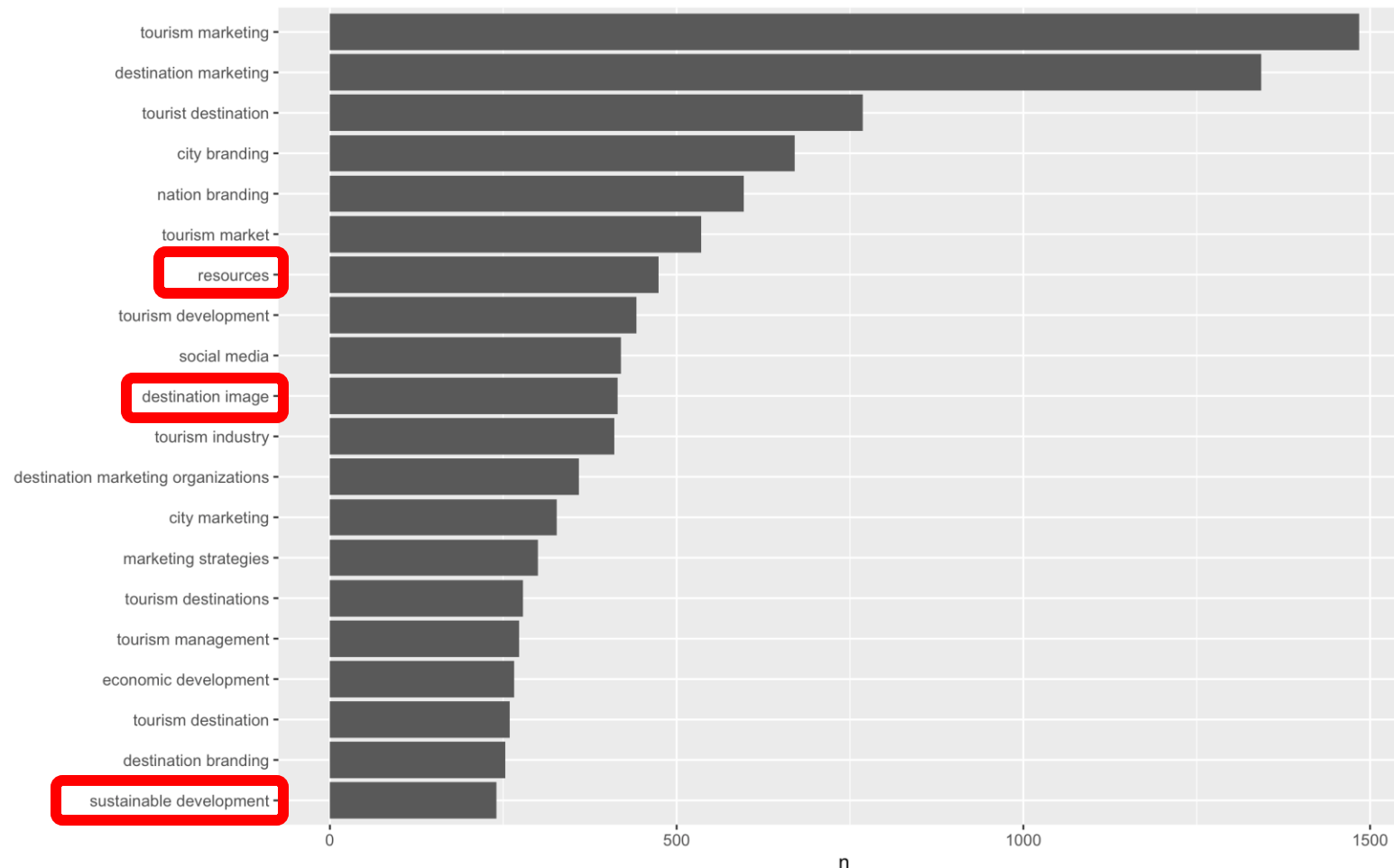
Many, but not very many (perhaps not enough): grey literature?

Scientific literature analysis

- Automatic extraction of one-, two-, or three-word keywords from the title, abstract, and keywords of scientific articles
 - Manual cleaning of automatically extracted keywords by experts (e.g. *Carmen Bizzarri* to cite one of them!)
 - Counting of occurrences of each keyword within scientific articles
- Counting of co-occurrences of keyword pairs in the same scientific article

Scientific literature analysis

20 most frequently used keywords

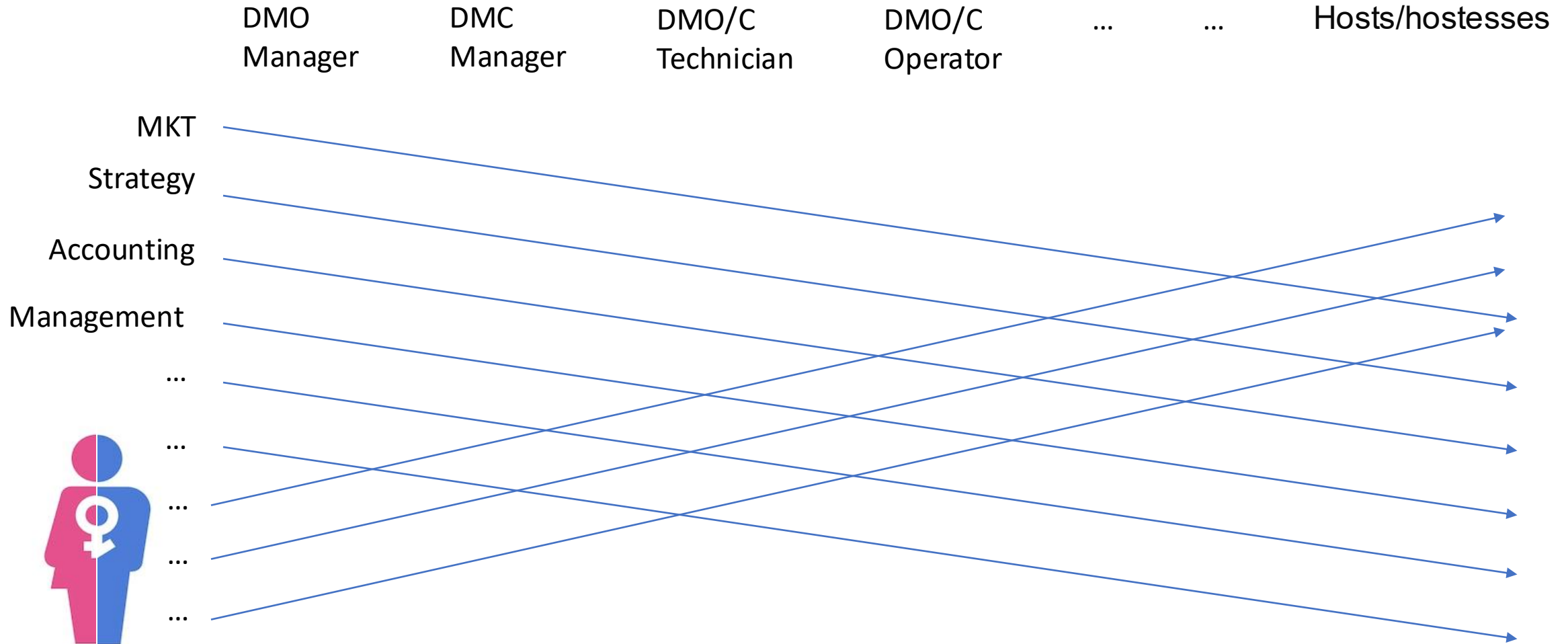


Both DMO (public) and DMC (private tour operators)

Scientific literature analysis – Tech Methodology

- Automatic extraction of technologies from the title, abstract, and keywords of scientific articles using Technimetro[®]
- Counting of occurrences of each technology within scientific articles
- Counting of co-occurrences of pairs of technologies in the same scientific article

To Do: "Old and New Skills" & "Occupations"



[Reshaping the tree: rebuilding organizations for AI](#)

Trends

In our activities involving master's courses, on-the-job training, and consulting for SMEs, we have noted this evolution in the tourism sector from 2023 to today.

In **2023**, when we designed a course on the **use of AI** for SMEs operating in the food and wine tourism sector, they had already consolidated their knowledge of tools such as management software (PMS for hospitality), tools to support social media marketing and email marketing...

Knowledge of AI was very limited and its use “virtually” nonexistent.

The widespread diffusion of ChatGPT models has made this technology mainstream and paved the way for a growing demand for training and consulting services in 2024 and 2025.

By **2024–2025**, digital skills no longer simply meant "use of ICT tools," but more broadly: digital literacy (search/management of information, content, collaboration, security), the ability to work with data and automation, and—increasingly—"AI literacy" and the skills to manage AI **processes** and **risks**.

In **2026**, the demand for training and consulting on **AI Agents** is becoming mainstream

Trends

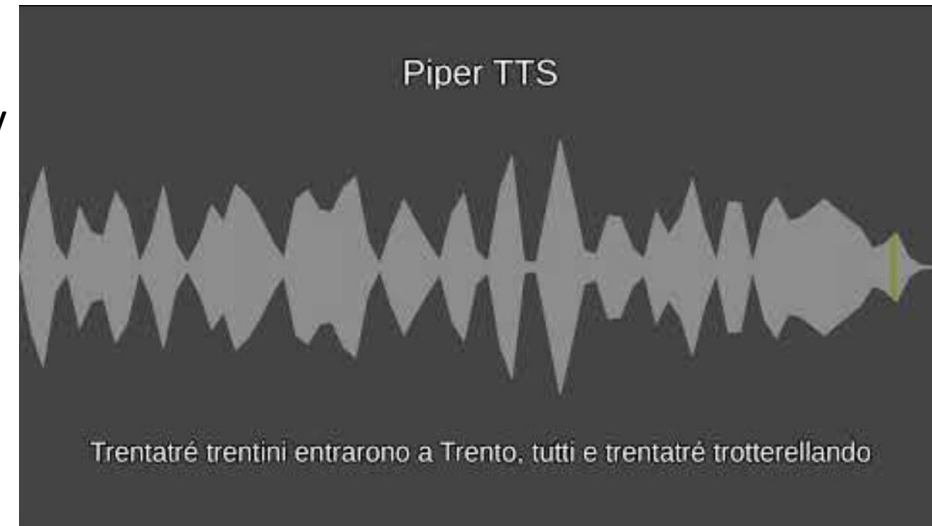
From our point of view, it seems that the change in skills required is driven by the most structured players in the sector, such as **DMOs** and **DMCs**

They're experimenting with AI Travel Planners, but based on the **human-in-the-loop principle**.

And they're interested in developing these AI Travel Planners to make them **multimodal** and capable of interacting more emotionally.

In 2026, these players are looking for:

- a web specialist who will be responsible for the API integration and the **MCP (Model Context Protocol) server**
- an expert in **designing gamified interactions** between potential customers and the AI Travel Planner
- an expert in building the tour operator's **experiential database** to improve smart matching between potential customer requests and the AI Travel Planner



Trends

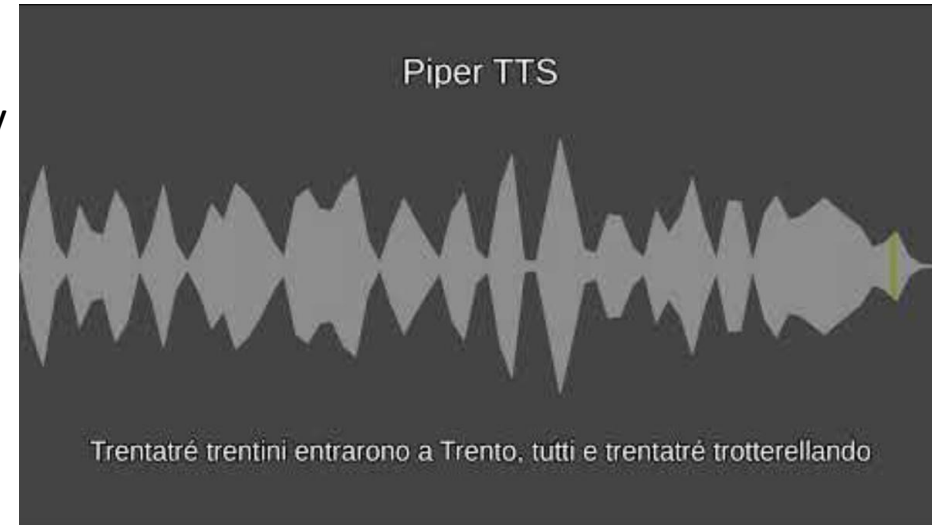
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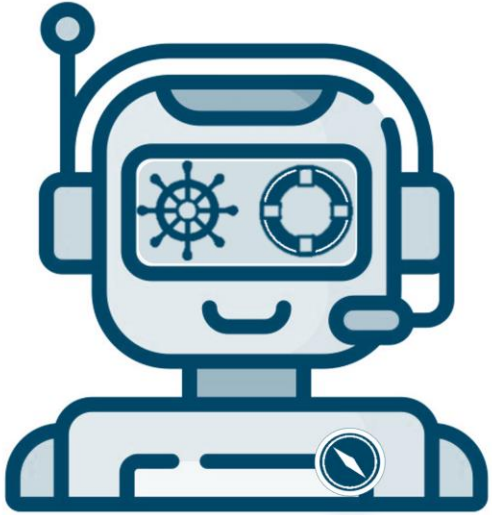
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- **Hybrid intelligence design**
- **AI-enhanced marketing**
- **Gamification, Storytelling, local SEO and GEO (Generative Engine Optimization)**

MarinAI



- CCI de Corse
- CCI Nice Côte d'Azur
- CCIAA Maremma e Tirreno
- CCIAA Riviera di Liguria
- Promocamera Sassari
- Università di Pisa

Digital Twinning Project for the Sustainable Development of Marinas in the Cross-Border Area

Front-end dedicated to **yachtsmen**, aimed at encouraging visits to **inland areas** optimized for **on-the-fly yachtsman profiling** through inland visit scenarios in a gamified experience.

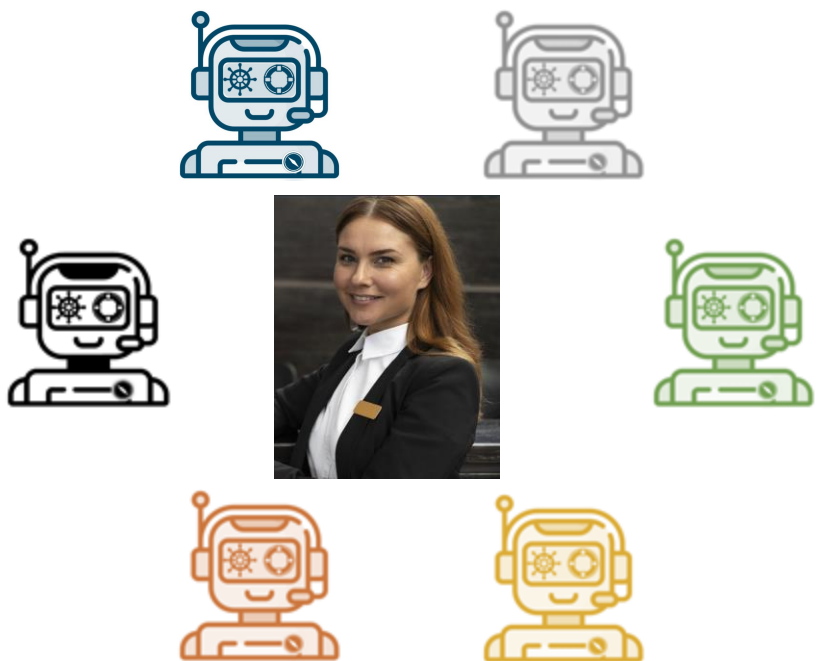
Back-end supporting **DMOs -DMCs** in **inland areas** to decongest marinas during peak times and attract yachtsmen with diverse and unexpected experiences.

For us (UniPisa), it is a project to test the support we can provide to DMOs and DMCs to help them in the digital transition. **It aims to bridge the gap between prompting and communication skills through a customization of an LLM dedicated to tourism** and, in this particular case, to marinas and the inland areas close to the marina.

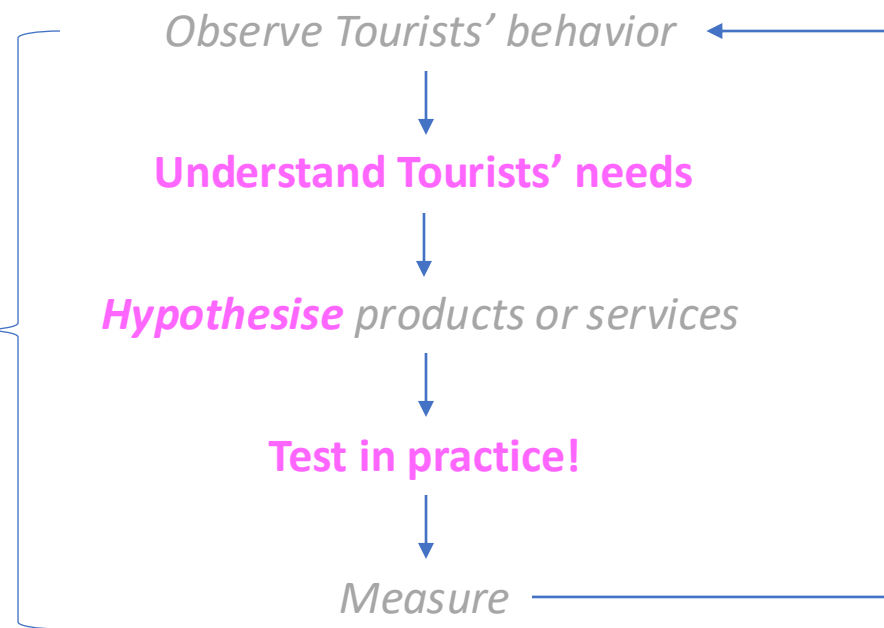
BEAMMEUP



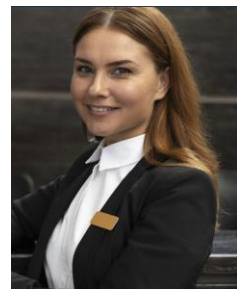
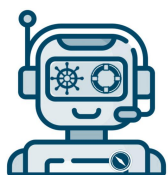
www.beammeup.it
info@beammeup.it



Hybrid intelligence



```
MODELS = {
  "analitico": "llama3:latest", # Logica, dati, probabilità
  "controintuitivo": "qwen2.5:7b", # Pensiero laterale, creatività
  "pragmatico": "llama3.2:3b", # Soluzioni concrete e veloci
  "empatico": "phi3:mini", # Etica, psicologia, impatto umano
  "moderatore": "mistral:7b", # Gestione conversazione e contesto
  "sintetizzatore": "gemma2:9b", # Sintesi coerente e strutturata
  "giudice": "gpt-4o-mini", # Valutazione JSON (OpenAI)
}
```



IL TUO PROBLEMA

Conviene maggiormente creare una infrastruttura di 6 agenti in locale comprando l'Hardware o utilizzare le API cloud e pagare in base al consumo?

Nuovo problema Avvia dibattito

- Moderatore Analitico Controintuitivo Pragmatico Empatico Sintetizzatore

Dibattito completato.

MODERATORE

Moderatore: Il problema attuale riguarda la scelta tra l'acquisto di hardware per creare un'infrastruttura di 6 agenti in locale oppure l'utilizzo delle API cloud e il pagamento a seconda del consumo.

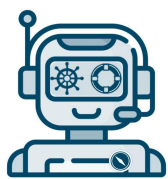
Rispetto le regole: Rimani pertinente al problema, rispetti la concisione e dimostra rispetto agli altri partecipanti. Passo la parola all'Analitico per iniziare il dibattito.

ANALITICO

Grazie per l'opportunità di intervenire. Secondo i dati dell'ISTAT, nel 2022 il costo medio del hardware per un agente locale era di circa €1.500 (fonte: ISTAT, Indagine sulle tecnologie dell'informazione e della comunicazione - IT e CT). Considerando che l'infrastruttura richiederebbe sei agenti, il costo totale sarebbe quindi di circa €9.000.

Per quanto riguarda le API cloud, secondo un rapporto del 2022 della società di consulenza Gartner, il costo medio per utilizzo delle API cloud è di circa €0,50 per unità di dati elaborata (fonte: Gartner, "Cloud Pricing and Cost Calculator"). Supponendo che l'infrastruttura dovrà elaborare un volume di dati significativo, potremmo stimare il costo annuo delle API cloud intorno a €2.000-€3.000.

In conclusione, considerando i costi del hardware e le stime dei costi delle API cloud, sembra che l'opzione



Verdetto del Giudice

Measure!

#1 — Analisi costi hardware vs API cloud

Proposta da: Analitico

Confronto tra costi hardware locale e API cloud, evidenziando la convenienza delle API.

Intelligenza	7/10	Fattibilità	8/10	Originalità	5/10
Follia	2/10	Impatto Soc.	6/10	Sostenib. Ec.	7/10

Punteggio totale: 5.83/10

L'idea è ben strutturata, ma manca di considerare i benefici a lungo termine dell'hardware locale.

#2 — Vantaggi dell'infrastruttura locale

Proposta da: Controintuitivo

Sottolinea i benefici dell'hardware locale in termini di controllo, efficienza e resilienza.

Intelligenza	8/10	Fattibilità	6/10	Originalità	8/10
Follia	7/10	Impatto Soc.	8/10	Sostenib. Ec.	6/10

Punteggio totale: 7/10

L'idea è innovativa e ben argomentata, ma presenta rischi legati ai costi iniziali.

#3 — Approccio graduale all'infrastruttura

Proposta da: Pragmatico

Suggerisce di valutare i costi di acquisto e manutenzione dell'hardware locale in modo graduale.

Intelligenza	7/10	Fattibilità	9/10	Originalità	5/10
Follia	3/10	Impatto Soc.	7/10	Sostenib. Ec.	8/10

Punteggio totale: 6.5/10

L'idea è pratica e realizzabile, ma potrebbe mancare di visione a lungo termine.

#4 — Creazione di una commissione per il piano finanziario

Proposta da: Empatico

Propone di formare una commissione per presentare un piano finanziario dettagliato.

Intelligenza	6/10	Fattibilità	8/10	Originalità	6/10
Follia	2/10	Impatto Soc.	9/10	Sostenib. Ec.	7/10

Punteggio totale: 6.33/10

L'idea è utile per coinvolgere gli stakeholders, ma potrebbe risultare poco innovativa.

Idea Vincitrice: Vantaggi dell'infrastruttura locale

Questa idea offre una prospettiva innovativa e ben argomentata sui benefici a lungo termine dell'hardware locale.

Qualità del Dibattito

Coesione	8/10	Diversità	9/10	Profondità	7/10
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Il dibattito è stato ricco di spunti e ha mostrato una buona varietà di prospettive, con un'analisi approfondita delle opzioni.