

AI-driven platform for skills development in the Balkan emerging markets

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Abstract: The growing role of digital platforms in professional development has intensified the need for inclusive, personalised and regionally responsive environments that combine mentorship, networking and lifelong learning. Women professionals in the Balkans continue to face structural barriers, including limited access to mentors, reduced professional visibility and fragmented opportunities for cross-border collaboration. This paper presents Balkan Women Connect, a proof-of-concept (PoC) digital platform integrating profile-based onboarding, mentor matching, professional networking, event participation and curated educational resources. A design-oriented methodology translates requirements derived from the literature, regional challenges and project objectives into a modular architecture and user-centred interaction flows. At the PoC stage, personalisation relies on transparent multi-criteria scoring of user-defined skills, interests and career goals; learned ranking is reserved for subsequent validation during the pilot stage. The PoC illustrates the technical feasibility of integrating explainable mentor matching, privacy-aware personalisation, event participation and access to educational resources, but it does not provide empirical evidence of long-term professional impact. Future work will evaluate recommendation quality, usability, engagement, bias, privacy and professional outcomes with real users.

Keywords: Digital platforms, Online mentorship, Women professionals, Professional networking, Privacy by design.

Platformă bazată pe inteligență artificială pentru dezvoltarea competențelor pe piețele emergente din Balcani

Rezumat: Rolul tot mai important al platformelor digitale în dezvoltarea profesională a accentuat necesitatea unor medii incluzive, personalizate și adaptate regional, care să integreze mentoratul, crearea de rețele profesionale și învățarea pe tot parcursul vieții. Femeile profesioniste din Balcani continuă să se confrunte cu bariere structurale, printre care accesul limitat la mentori, vizibilitatea profesională redusă și oportunitățile fragmentate de colaborare transfrontalieră. Lucrarea prezintă Balkan Women Connect, o platformă digitală de tip proof-of-concept (PoC), care integrează configurarea profilului, potrivirea mentor-mentee, crearea de rețele profesionale, participarea la evenimente și accesul la resurse educaționale selectate. Metodologia orientată spre design transpune cerințe derivate din literatura de specialitate, din problematica regională și din obiectivele proiectului într-o arhitectură modulară și în fluxuri centrate pe utilizator. În stadiul PoC, personalizarea se bazează pe o evaluare multicriterială transparentă bazată pe competențele, interesele și obiectivele profesionale declarate de utilizatoare, în timp ce modelele adaptive învățate sunt rezervate validării ulterioare în pilot. PoC-ul ilustrează fezabilitatea tehnică a integrării potrivirii explicabile în mentorat, a personalizării atente la confidențialitate, a evenimentelor și a resurselor educaționale, fără însă a constitui o validare empirică a impactului profesional pe termen lung. Cercetările viitoare vor evalua calitatea recomandărilor, utilizabilitatea, implicarea utilizatoarelor, biasul, confidențialitatea și rezultatele profesionale în condiții reale de utilizare.

Cuvinte-cheie: platforme digitale, mentorat online, femei profesioniste, rețele profesionale, confidențialitate prin proiectare.

1. Introduction

Digital platforms have reshaped professional development by expanding access to knowledge, professional networks and career opportunities. Digital transformation is not solely a

technical shift; it also affects organisational practices and wider societal development, including the opportunities and challenges associated with successive industrial revolutions (Petcu et al., 2020; Banciu et al., 2023). Artificial intelligence, recommender systems and data analytics have increased the capacity of these platforms to deliver adaptive learning paths and more relevant professional connections. In emerging economies, such environments can support human-capital development and participation in changing labour markets. Their benefits, however, are unevenly distributed. Across the Balkan region, differences in digital infrastructure, institutional support and labour-market conditions continue to affect participation, while women professionals often encounter additional barriers related to access to mentorship, professional visibility and cross-border collaboration.

Mentorship, networking and lifelong learning are complementary components of professional development. Mentorship facilitates the transfer of experience and tacit knowledge, supports career decision-making and can strengthen professional confidence. Networks provide access to information, opportunities and collaboration, thereby contributing to social capital. Continuous learning, increasingly delivered through digital channels, enables professionals to adapt to technological change and evolving skill requirements. Integrating these functions within one digital environment can reduce fragmentation and create more coherent development pathways.

Many existing professional platforms are based on global models that give limited attention to regional labour markets, linguistic diversity and sociocultural context. Their personalisation functions may rely on narrow profile attributes, and their networking features do not necessarily provide the structure required for sustained mentoring. Gender-sensitive design is also frequently underdeveloped, limiting the ability of such systems to respond to unequal access, bias and the need for safe and supportive professional communities.

This study addresses the following design question: how can a digital platform integrate mentorship, networking, events and learning resources in a way that is personalised, explainable and responsive to the needs of women professionals in the Balkans? To address this question, the paper presents the conceptual design and prototype functionality of Balkan Women Connect. Its contribution is an integrated platform model that combines a structured user profile, transparent mentor matching, personalised recommendations and regionally relevant community resources.

The paper is organised into six sections. Following the introduction, Section 2 reviews the literature on digital platforms, online mentorship and women-centred digital communities. Section 3 presents the design methodology, architecture, recommendation logic and onboarding process of the platform. Section 4 describes the main functional modules of Balkan Women Connect, while Section 5 discusses personalisation, transparency, regional relevance and privacy. Section 6 presents the conclusions, limitations and directions for future work.

2. Literature review and conceptual background

Digital platforms combine information access, social interaction and service delivery within a common environment. Information culture and communication systems provide an early foundation for this transition (Banciu, 2000), while e-service research highlights accessibility and user engagement (Anghel et al., 2013). More recent platform studies emphasise modularity, scalability and coordination among user groups (van Dijck et al., 2018; Nambisan et al., 2019). In emerging and transition economies, however, technical availability alone does not ensure participation; professional platforms must also respond to local labour markets, language diversity, institutional conditions and unequal access to networks. This motivates treating professional networking, online mentorship and women-centred digital communities as complementary rather than separate functions.

2.1. Digital platforms for professional networking

General-purpose professional networking platforms facilitate profile visibility, contact development, opportunity discovery, and access to weak ties beyond a user's immediate

organisation. These functions can strengthen social capital and enable cross-border interaction at a scale that would be difficult to achieve exclusively through face-to-face networks. Nevertheless, broad professional networks are primarily designed to maximise connection and content circulation; they do not necessarily support the depth, continuity, and accountability required in a mentoring relationship. Their recommendation processes may also remain opaque, while standardised profiles often give limited attention to regional context, language preferences, career stage, or the structural barriers experienced by specific user groups. Consequently, networking functionality is useful but insufficient for the proposed platform. It needs to be connected to explicit development goals, curated learning opportunities, and structured forms of professional support rather than treated as an end in itself.

2.2. Online mentorship systems

Online mentorship, or e-mentoring, extends traditional mentoring through computer-mediated communication and reduces geographical and scheduling barriers between mentors and mentees (Bierema & Merriam, 2002). This flexibility is especially relevant in the Balkans, where potential participants are distributed across countries and professional ecosystems. However, an online mentorship system should provide more than a searchable directory or an initial introduction. Effective mentoring depends on sustained interaction, shared expectations, appropriate role definition, goal setting, and feedback, because relationship quality remains central to both career-related and psychosocial outcomes (Allen & Eby, 2007).

Two broad matching approaches can be distinguished. In manually initiated one-to-one mentoring, users select partners through profiles or institutional mediation. This approach preserves individual agency but becomes difficult to manage as the community grows. Algorithm-supported matching can improve scalability by comparing structured attributes such as expertise, skills sought, professional interests, career objectives, language, location, and availability. Recommender-system research indicates that such multidimensional information can improve relevance, but automated matching should remain explainable and subject to user choice (Ricci et al., 2022). A compatibility score is therefore most useful when accompanied by a concise explanation of the shared interests or complementary expertise behind it. This hybrid model combines computational support with human judgement and reduces the risk that matching becomes a purely technical or deterministic process. It also requires careful governance of personal data, bias monitoring, and mechanisms through which users can reject, refine, or evaluate recommendations.

2.3. Women-centred digital communities

Women-centred digital communities add a collective dimension not captured by one-to-one mentoring alone. They can support peer learning, role-model visibility, mutual encouragement and opportunity exchange. Research on women-only online groups shows that these environments can function as digital safe spaces when supported by clear norms, active moderation, privacy safeguards and mechanisms for managing harmful behaviour (Ammari et al., 2022). Research on mentorship for women in technology-oriented communities similarly identifies both professional-development and psychosocial benefits, particularly where participants face isolation or exclusion (Jacobs, Milewicz & Serebrenik, 2024).

A women-centred platform should not treat women as a homogeneous category. Needs vary by country, profession, career stage, age, language, caregiving responsibilities and digital literacy. Inclusive, user-controlled personalisation is therefore required. In the Balkan context, women professionals face uneven access to mentorship, reduced visibility and fragmented cross-border networks (Vasiloiu et al., 2025). Regional adaptation must consequently include relevant mentors, events, learning resources and community practices, while still enabling cross-border cooperation.

The related work yields three connected requirements: integrated professional-development functions, transparent and user-controlled personalisation, and deliberate privacy, moderation and regional adaptation. Existing solutions commonly emphasise only part of this combination. The research gap is therefore not the absence of networking or mentoring tools as such, but the limited

availability of an integrated, explainable and regionally adapted ecosystem for women professionals in the Balkan emerging markets. Table 1 makes this integrative contribution explicit.

Table 1. Functional positioning of Balkan Women Connect against related platform types

Platform type	Mentoring	Networking / events / learning	Personalisation and explainability	Community / regional focus
General professional networks	Usually unstructured	Strong networking; other functions vary	Often broad or opaque	General-purpose; limited regional tailoring
E-mentoring systems	Core function	Usually secondary	Matching varies by system	Programme- or institution-specific
Women-centred digital communities	Peer support or mentoring	Community resources and exchange	Not usually the central feature	Strong gender focus; regional scope varies
Balkan Women Connect (PoC)	Structured discovery, request and goals	Integrated events and learning resources	Transparent multi-criteria scoring with explanations	Women-centred and Balkan-region adapted

Source: authors' synthesis based on the literature discussed in Sections 2.1-2.3; the comparison is functional, not a market-performance assessment.

3. Platform architecture and design methodology

3.1. Design methodology and requirements

The study follows a design-oriented process with four stages. First, requirements were synthesised from the literature reviewed in Section 2, the regional problem framing and project objectives, focusing on mentoring continuity, explainability, privacy, accessibility, regional relevance and modular growth. Second, these requirements were translated into functional flows and service boundaries. Third, an iterative PoC was developed for onboarding, the personalised dashboard, mentor discovery and requests, events and educational resources. Fourth, design decisions were checked through internal traceability between the identified requirements, prototype screens, data flows and architectural components. This constitutes design validation rather than end-user validation: the present study does not claim empirical evidence of usability, recommendation accuracy or professional impact, all of which require pilot testing with real users.

Terminology is used consistently with this scope. Platform denotes the envisaged end-to-end digital ecosystem; PoC denotes the current prototype and its transparent profile-based recommendation logic; proposed architecture denotes scalable deployment components intended for later implementation and pilot validation. Human-centred design links these decisions to users, tasks and context of use (ISO, 2019).

Three principles operationalise the requirements. Personalisation uses structured skills, professional interests and career goals to rank relevant mentors, events and resources (Ricci et al., 2022). Inclusivity treats accessibility across countries, professions, career stages and digital-literacy levels as a lifecycle requirement (ISO, 2019). Scalability is supported by modular service boundaries that can be extended incrementally as technical and organisational needs evolve (Nambisan et al., 2019).

3.2. System architecture

Figure 1 separates the current PoC functional scope from the proposed scalable deployment architecture. The PoC covers the user-facing flows, profile management and transparent profile-based recommendation scoring described and illustrated in this paper. The lower part of the figure represents deployment components intended for pilot-scale implementation and validation. This distinction prevents target infrastructure from being presented as already validated. Modular

service boundaries and common interfaces are retained to support interoperability and future extension (Barbu et al., 2024).

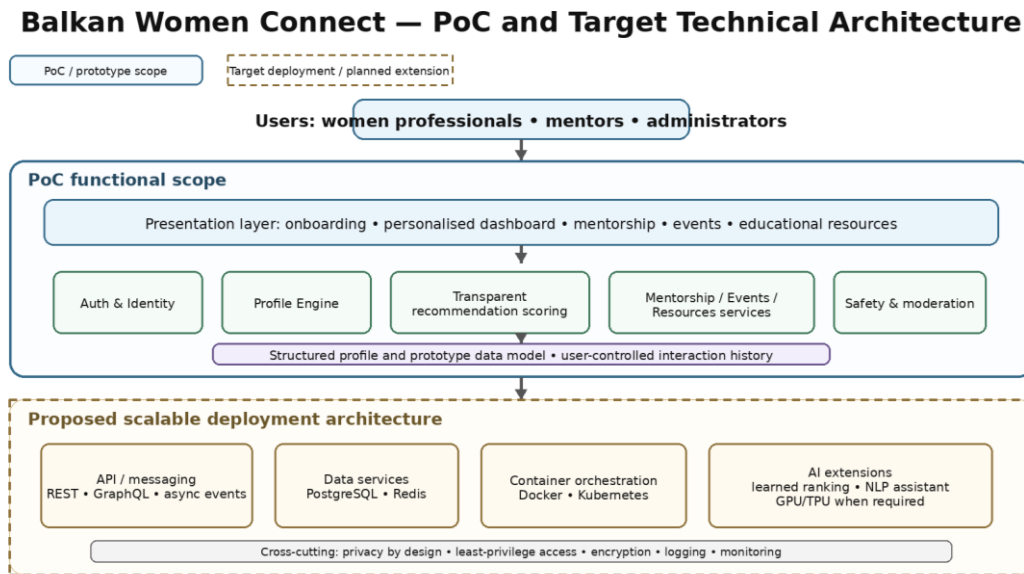


Figure 1. PoC functional scope and proposed scalable technical architecture of Balkan Women Connect

Source: authors' own elaboration based on project technical documentation

Within the PoC scope, Auth & Identity, the Profile Engine and domain services support onboarding, mentor discovery, events, learning resources and recommendation explanations. The target deployment extends these functions with asynchronous messaging, learned ranking or NLP assistance and operational analytics. The shared profile links personalisation across modules while retaining clear functional boundaries.

Core data are structured around profiles, mentorship relationships, events, resources and recommendation metadata. PostgreSQL and Redis, together with REST or GraphQL interfaces and asynchronous messaging, are specified for scalable deployment; in this paper, they are architectural choices rather than evidence of production-scale performance.

Similarly, Docker/Kubernetes orchestration, elastic cloud resources and accelerator-enabled compute describe the target deployment rather than completed large-scale validation. Security, privacy and observability remain cross-cutting requirements, addressed through encrypted communications and storage, least-privilege access, data minimisation, logging and monitoring. These choices provide a path from the PoC to a scalable pilot while keeping infrastructure claims separate from the results reported here.

3.3. Recommendation and matching logic

At PoC stage, the recommendation mechanism is intentionally transparent and does not depend on an opaque trained model. Candidate mentors are first filtered by role and availability and then ranked with a weighted multi-criteria score, $S(u,m) = \sum w_k f_k(u,m)$, where the components represent skill complementarity, shared professional interests, career-goal alignment, language or location preferences and availability. Each component is normalised to the interval [0,1], the configurable weights sum to 1, and the interface can expose the highest-contributing criteria as a short explanation. Event and resource ranking follow the same content-based principle through overlap between profile attributes and item tags.

Interaction feedback can later be used to recalibrate weights or train learning-to-rank models, but such adaptive models are not evaluated in this study. Conversational NLP assistance is likewise treated as a planned extension. The present AI-supported contribution therefore lies in structured recommendation, explainability and an architecture prepared for later adaptive learning, not in claims of superior predictive performance.

3.4. User-centred design and onboarding process

The onboarding process operationalises the requirements identified in Section 3.1 by collecting information progressively rather than through a single extensive form. Users provide basic professional information, geographical location, skills, interests, career goals and mentorship preferences. Figure 2 shows how simplicity, inclusivity and reduced cognitive load are translated into the interaction flow. Evidence from e-learning environments indicates that usability, collaboration, perceived safety and awareness of digital risks strongly influence user acceptance (Iordache & Barbu, 2021; Barbu et al., 2023).

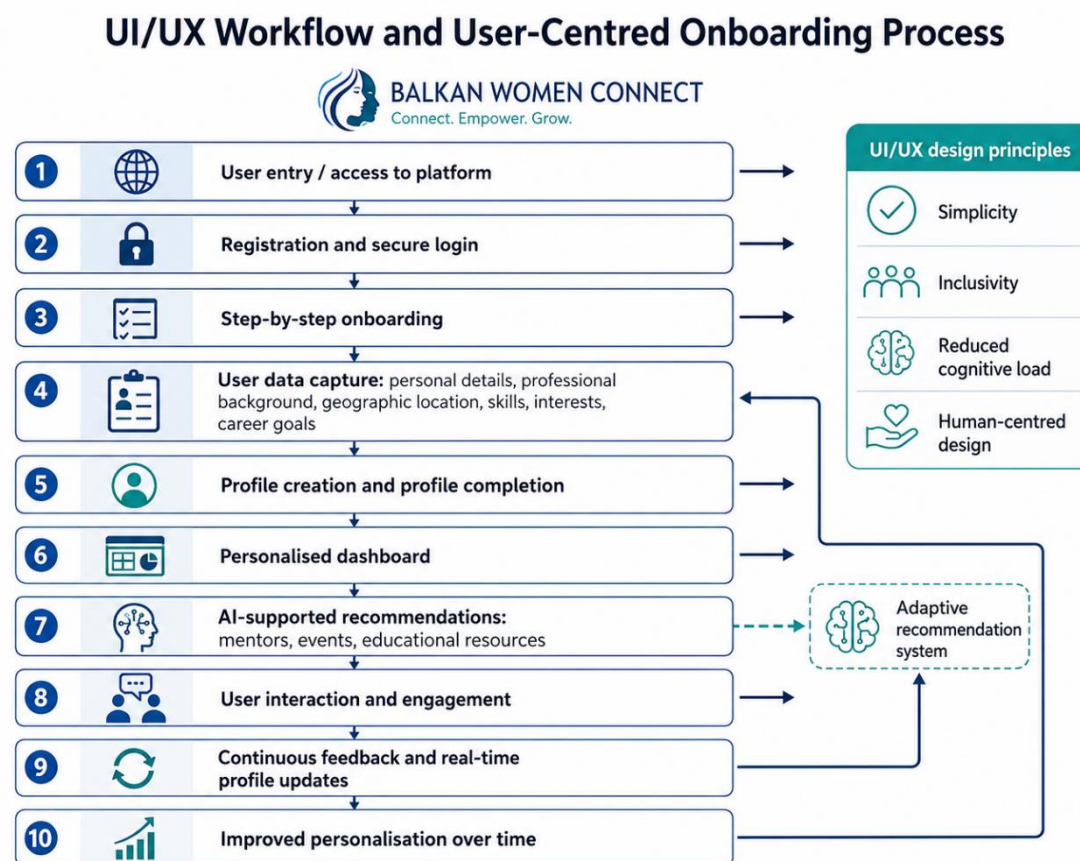


Figure 2. UI/UX workflow and user-centred onboarding process

Source: authors' own elaboration

The collected information is transformed into a structured and editable profile that supports the platform's core functions. Progressive disclosure reduces the amount of information requested at each step, while clear labels and editable fields allow users to retain control over their data. These design choices are consistent with evidence that clarity, low interaction cost and perceived relevance contribute to user engagement in digital systems (O'Brien et al., 2018).

The profile is updated as users participate in mentoring, register for events and interact with educational resources. These interaction signals feed an adaptive recommendation cycle, enabling the system to revise suggestions as interests and goals develop over time (Ricci et al., 2022). The onboarding process is therefore not a one-off registration step but the starting point of continuous, user-controlled personalisation.

4. Core functional modules of the platform

Balkan Women Connect is organised around five core functional modules: user onboarding and profile creation, a personalised dashboard, mentorship, events management and educational resources. Figures 4-7 show PoC interface screens for these functions. The modules use a shared

user profile but retain distinct responsibilities; feedback-driven automatic model adaptation is treated as a future capability unless explicitly stated. Figure 3 illustrates how these five modules are connected through the shared user profile and personalisation engine.

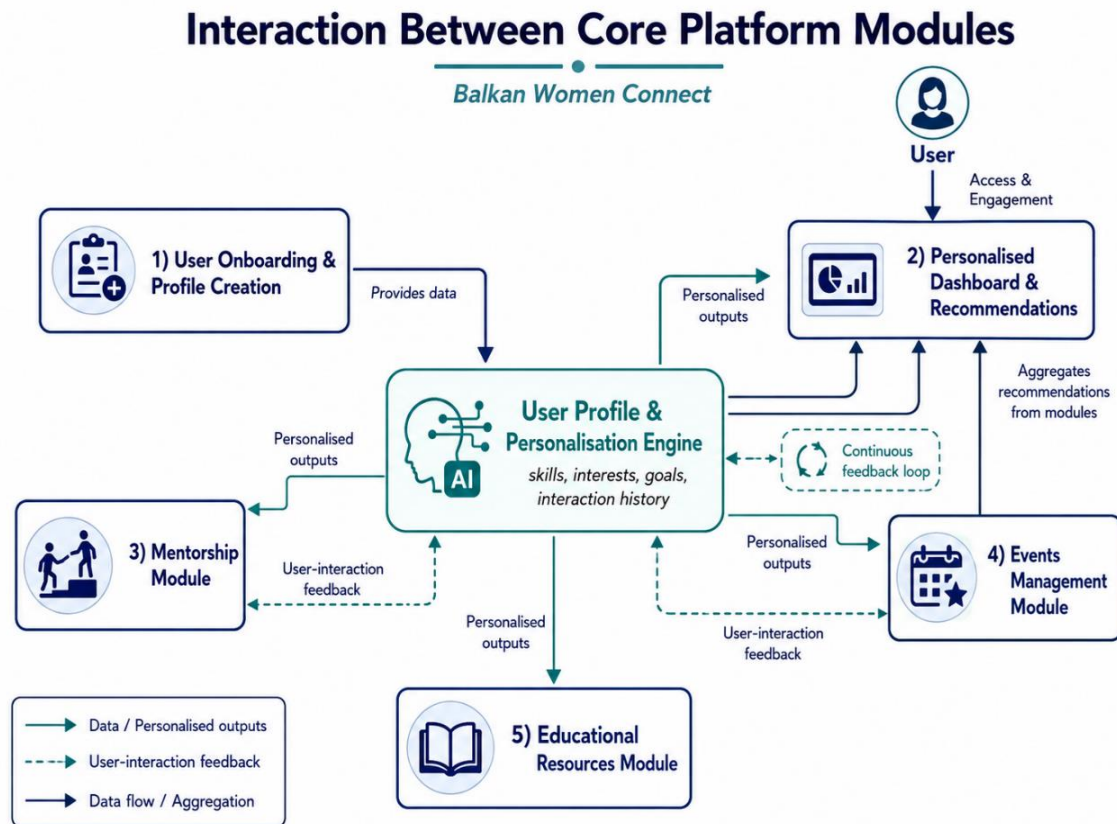


Figure 3. Interaction between the core modules of Balkan Women Connect

Source: authors' own elaboration

4.1. User onboarding and profile creation

The onboarding module is the first point of interaction with the platform and establishes the data foundation for personalisation. Users provide essential profile information, including professional role, location, skills, interests and preferred forms of professional support. Figure 4 summarises the progressive onboarding sequence through three representative steps: (a) profile details, (b) professional interests and (c) career goals.

The sequence is divided into short, editable steps to reduce cognitive load and support users with different levels of digital experience. Profile attributes can subsequently be revised, allowing recommendations to reflect changes in professional priorities, interests and availability.

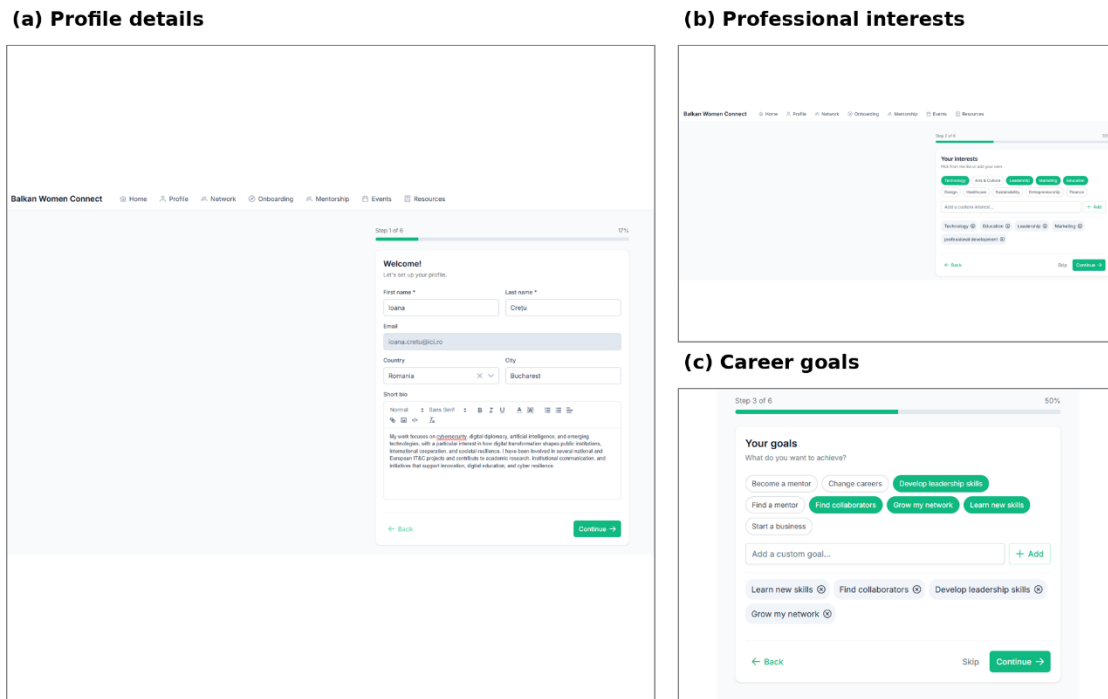


Figure 4. Progressive onboarding sequence: (a) profile details; (b) professional interests; (c) career goals.
Source: Balkan Women Connect prototype (authors' own research)

4.2. Personalised dashboard and recommendations

The dashboard consolidates the mentors, events and educational resources considered most relevant to each user. At PoC stage, rankings are generated from the structured profile using the transparent mechanism described in Section 3.3; interaction history is retained as a potential refinement signal for later pilot work.

Each recommendation is accompanied by a compatibility indicator and a concise explanation of the attributes that contributed most to the match. The purpose is to support informed user choice rather than present algorithmic output as a final decision. The dashboard also aggregates outputs from the mentorship, events and educational-resource modules.

4.3. Mentorship module

The mentorship module supports discovery, initiation and management of mentor-mentee relationships. Potential mentors are ranked using the multi-criteria mechanism in Section 3.3, and users can review the basis of a recommendation before submitting a request. Conversational assistance for goal setting and navigation is a planned extension, informed by experimental chatbot applications for accelerated digital transformation in public institutions (Duțescu, Apostol & Barbu, 2024).

The interface distinguishes between two relationship states:

- Potential matches – recommended users whose experience and interests align with the mentee's profile;
- Active mentorships – established mentor-mentee relationships managed through the platform.

Each potential match includes a compatibility score and a concise explanation based on shared interests or complementary expertise. Figure 5 shows the transition from mentor discovery to a formal mentorship request, thereby illustrating how algorithmic recommendations remain subject to explicit user action.

Once a relationship is established, the module supports:

- the definition of shared mentoring goals;
- the recording of mentoring activities; and
- feedback and evaluation of the relationship.

In the PoC, ratings and qualitative feedback are captured as evaluation inputs. Their automatic use for weight calibration or model updating is reserved for future pilot work, where the same information can also support quality monitoring across active mentorships.

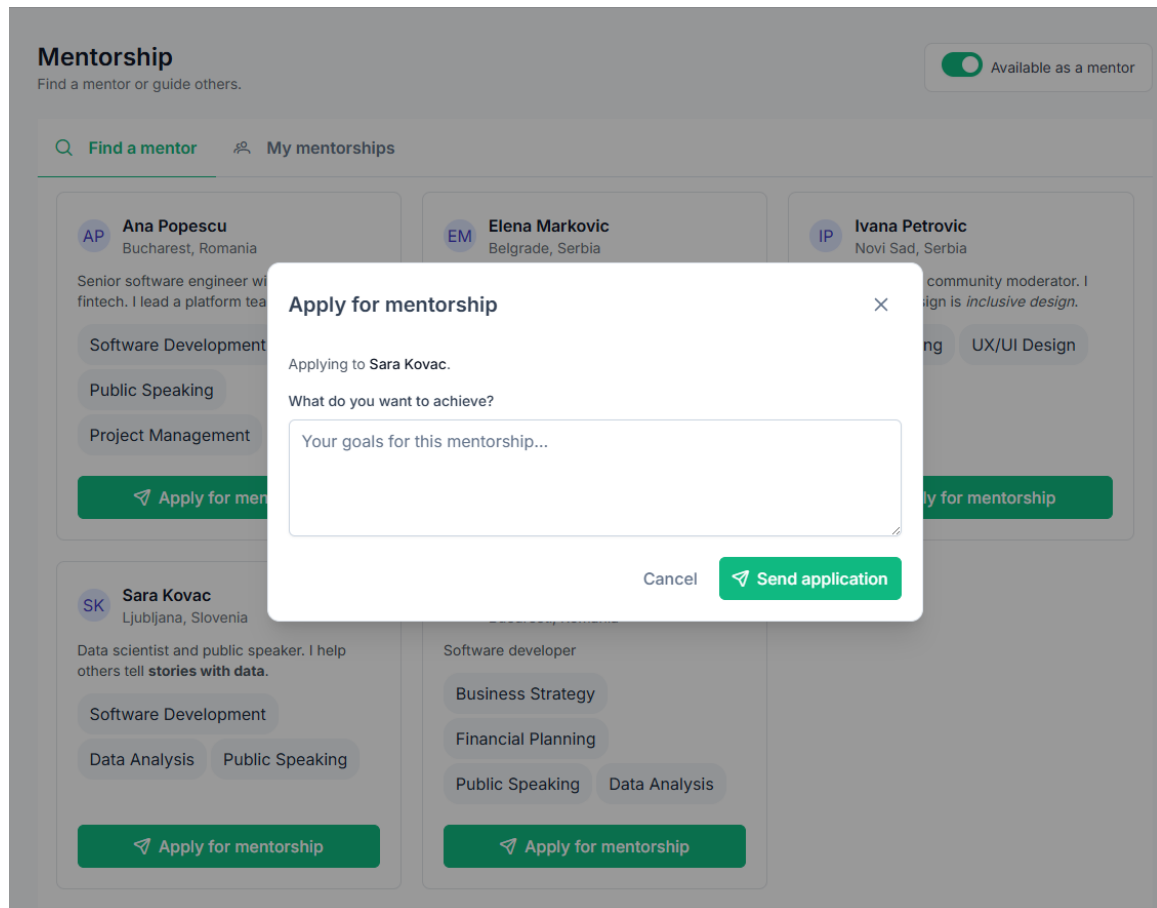


Figure 5. Mentor discovery and mentorship-request interface

Source: Balkan Women Connect prototype (authors' own research)

4.4. Events management module

The events module enables users to discover and join professional-development activities, including conferences, workshops, webinars and networking events. Events can be filtered by format and type, while thematic tags support more targeted exploration.

Each event record presents the date, location or delivery format, participation conditions and thematic information. Registration and attendance data can be retained as interaction signals for later refinement of recommendations, subject to the privacy controls described in Section 5.4.

Figure 6 illustrates the event-discovery interface. By combining regional events with profile-based ranking, the module supports both professional learning and cross-border network development.

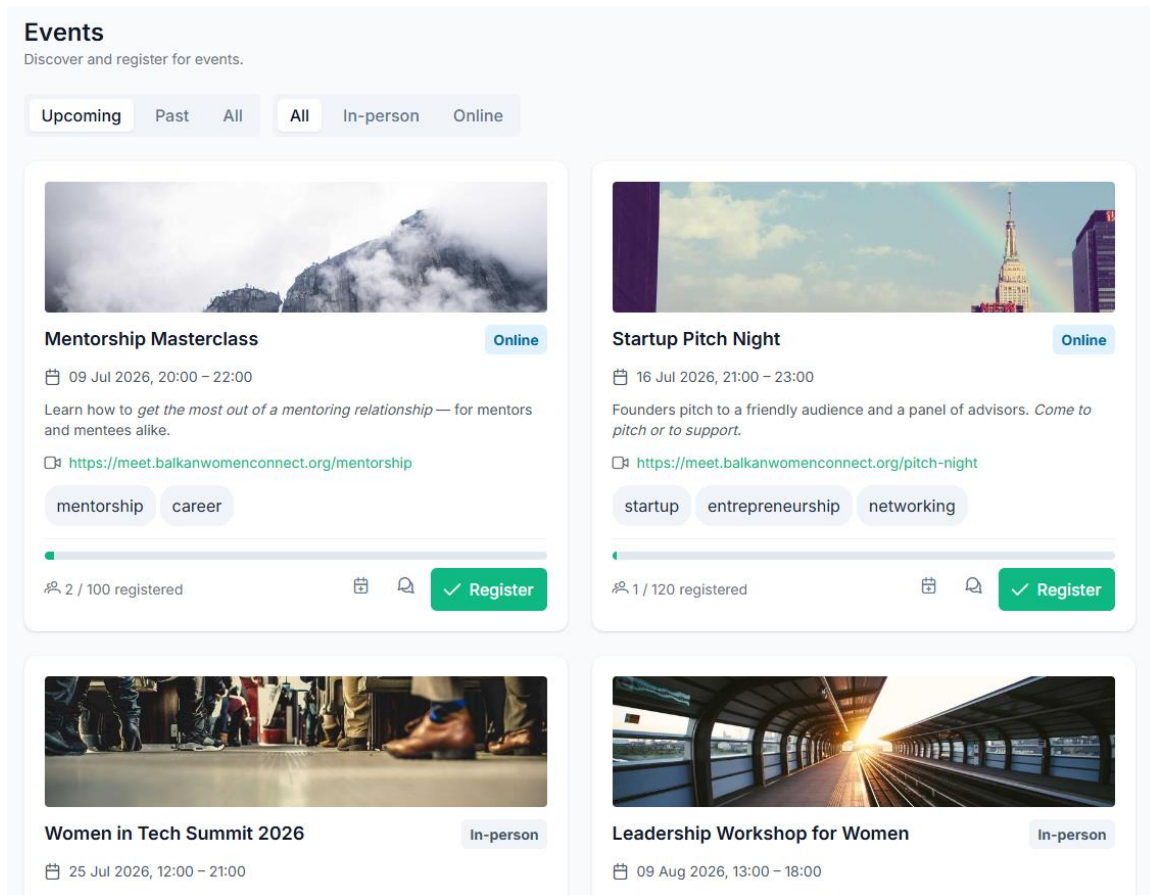


Figure 6. Event-discovery and registration interface

Source: Balkan Women Connect prototype (authors' own research)

4.5. Educational resources module

The educational-resources module supports continuous learning through curated articles, guides and podcasts. Resources are categorised and recommended according to users' professional goals and declared interests. Metadata such as publication date, views and reactions helps users assess relevance, while contribution functions allow the community to propose additional material.

As shown in Figure 7, the module combines browsing, filtering and recommendation functions within a single interface. It complements synchronous mentoring and event participation by providing asynchronous learning opportunities that remain available throughout the user's development pathway.

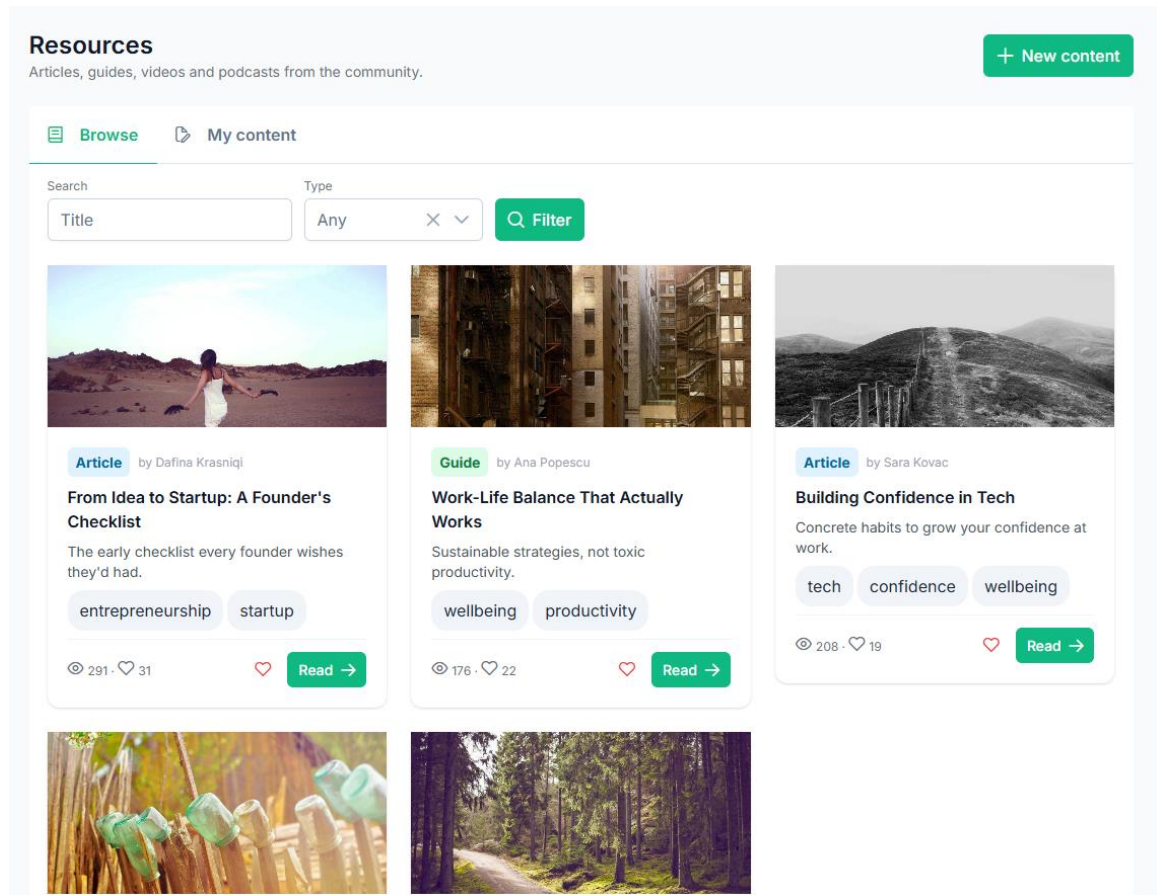


Figure 7. Educational-resources interface

Source: Balkan Women Connect prototype (authors' own research)

5. Discussion

The PoC shows how personalisation, mentorship and regionally relevant resources can be integrated within one digital environment. Because this is a design-oriented study rather than a controlled impact evaluation, the discussion addresses design implications, technical feasibility and limitations, not causal claims about professional outcomes.

5.1. Personalisation and user engagement

Personalisation can reduce information overload by prioritising mentors, events and resources that correspond to users' skills, interests and professional objectives, consistent with recommender-system research on relevance and adaptability (Ricci et al., 2022). The shared profile also creates continuity across modules, while editable attributes and explicit feedback preserve user control. This balance matters because engagement depends on perceived relevance and meaningful interaction, not simply system activity (O'Brien & Cairns, 2016).

5.2. Transparency in mentor matching

A distinctive feature is the combination of compatibility scores with concise explanations of why a mentor is recommended. Presenting shared interests, complementary expertise and relevant goals gives users a basis for accepting or rejecting a match and makes the relationship between profile data and system output more visible (Ricci et al., 2022). Because mentoring also depends on aligned expectations (Allen & Eby, 2007), explainability is treated as part of interaction design and supports human judgement rather than replacing it.

5.3. Regional relevance and diversity

The regional focus addresses fragmented networks, linguistic diversity and unequal access to locally relevant mentors and opportunities. Adaptation is therefore expressed through the mentor community, events and educational resources, not only through interface localisation, while the cross-border structure enables connections beyond users' immediate national or organisational networks.

European and OECD analyses continue to document gender disparities in digital participation and employment, supporting the need for targeted measures that improve access, skills and professional visibility (OECD, 2022; European Commission, 2023). A women-centred platform can contribute to this objective by facilitating role-model visibility, peer support and cross-border collaboration. Its design must nevertheless recognise diversity among women in terms of country, profession, career stage, language and digital literacy.

5.4. Privacy-by-design and positioning against related platform types

As Table 1 shows, the novelty is integrative rather than based on a single unprecedented feature. General-purpose professional networks maximise visibility and connection, e-mentoring systems emphasise relationship support, and women-centred communities emphasise safe peer interaction; Balkan Women Connect combines structured mentoring, events, learning resources and explainable recommendations in a regionally adapted ecosystem. The comparison is functional rather than competitive (Kenney & Zysman, 2020).

Privacy is central to this integration because profiles can contain location, career aspirations, interaction history, mentorship preferences and feedback. The platform therefore follows privacy by design and by default, consistent with Article 25 of the GDPR and related European guidance (European Parliament and Council of the European Union, 2016; European Data Protection Board, 2020). Data collection is limited to attributes required for stated functions, visibility is minimal by default, and users retain control over profile editing, matching participation and the use of interaction data for personalisation. This aligns digital innovation with proportionate organisational and cybersecurity safeguards (Banciu et al., 2023) and with the importance of user awareness of online risks (Barbu et al., 2023).

The privacy-related contribution lies in differentiated data boundaries: public professional information, restricted matching attributes and private mentorship records are treated as distinct contexts rather than as one universally visible profile. Role-based access, encrypted communications and storage, audit logging and retention rules support controlled processing, while recommendation explanations can expose contributing criteria without revealing another user's raw data. Aggregated or pseudonymised interaction signals are preferred for analytics when individual identification is unnecessary.

For a women-centred cross-border community, this approach reduces unnecessary exposure to unwanted contact, discrimination or professional profiling and positions privacy as an enabling condition for trust. Full validation of consent flows, retention periods and privacy-impact controls remains part of pilot deployment; a data-protection impact assessment should be undertaken where profiling may create a high risk to users' rights and freedoms.

6. Conclusions and future work

This study presents the design and PoC functionality of Balkan Women Connect, an AI-supported platform for professional development among women in the Balkans. The contribution is architectural and design-oriented: it integrates structured onboarding, transparent multi-criteria mentor matching, event discovery and educational resources within a privacy-aware modular ecosystem.

The revised methodology makes explicit how literature- and project-derived requirements are translated into functions and internally checked for design traceability. The platform/PoC/

target-architecture distinction also clarifies that the current evidence concerns design feasibility and prototype behaviour rather than validated production performance or professional impact.

The principal limitation remains the absence of longitudinal evidence from a large real-world user base. Real-user validation is therefore planned as the next research phase through implementation and pilot use of Balkan Women Connect at Aleksandër Moisiu University of Durrës, Albania, followed by comparable deployments in academic and professional settings across the Balkan region. These pilots will generate empirical evidence on recommendation relevance, perceived explainability, usability, engagement, bias, privacy and mentor-mentee relationship quality using quantitative indicators and qualitative feedback (Pollard & Kumar, 2021).

Further development will test alternative weighting strategies and learned ranking as interaction data become available, strengthen bias and privacy monitoring, and examine effects over time. Transfer beyond the Balkan context should be preceded by an analysis of local labour markets, social norms, language requirements and community-governance practices (Nambisan, Wright and Feldman, 2019).

Author contribution

Conceptualization: all authors; methodology: all authors; investigation: all authors; writing—original draft preparation: all authors; writing—review and editing: all authors; visualization: all authors. All authors have read and agreed to the published version of the manuscript.

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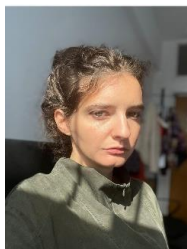
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