

# Smart Cities, Smart Talents: E-Recruitment for Human-Centric Urban Transformation in Morocco

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**Abstract**—Smart cities rely on human capital as much as on infrastructure. In Morocco, the *Digital Morocco 2030* strategy has emphasized digital talent as a cornerstone for urban innovation, alongside cloud services and connectivity. This study investigated how e-recruitment practices shaped talent pipelines for smart-city projects in the Tangier-Tétouan-Al Hoceïma (TTAH) region. Using a qualitative, multi-case design, data were collected through interviews, focus groups, and documentary analysis across five sites: public administration, employment intermediation (ANAPEC), smart logistics (Tanger Med), outsourcing hubs (Tétouan Shore), and industrial megaprojects (Tangier Tech City). Findings revealed four key challenges: (1) fragmented recruitment channels prolonging time-to-hire, (2) persistent skills mismatches in strategic domains such as data and logistics, (3) fairness and accessibility concerns, especially for women and rural candidates, and (4) uneven compliance with data protection norms. While platforms such as *Emploi-public.ma* and ANAPEC improved reach and access, weaknesses in matching, assessment, and compliance limited efficiency and trust. The study concludes that e-recruitment is not merely a technical tool but a strategic governance mechanism, shaping whether Morocco's digital transformation remains inclusive, transparent, and human-centric.

**Keywords**—Smart cities; e-recruitment; digital transformation; HR governance; workforce development

## I. INTRODUCTION

Smart city initiatives—covering mobility, ports, utilities, e-government, and data-driven services—relied as much on human capital as on infrastructure. In Morocco, the Digital Morocco 2030 strategy identified digital talent as one of its three accelerators, alongside cloud and connectivity, and aimed to generate new jobs and strengthen value creation by 2030 [1].

In the northern region, this agenda materialized through flagship projects such as the Tanger Med Port Complex, managed by the Tanger Med Special Agency (TMSA) [2]. As one of the Mediterranean's largest logistics hubs, Tanger Med became both a leader in port digitalization and a significant regional employment anchor. Similarly, the Tetouan Shore business park supported international outsourcing operations (ITO/BPO/KPO) and amplified the demand for technology-oriented profiles [3].

Despite these advances, stakeholders across local governments and private companies reported fragmented recruitment channels, slow hiring processes, and skills mismatches in critical domains such as data science, cybersecurity, and artificial intelligence. In this context, e-recruitment—including public platforms, digital job-candidate matching, and data-compliant practices—emerged as a potential strategic enabler of human-centric smart services.

The present study examined how e-recruitment practices shaped talent pipelines for smart-city projects in

Tangier-Tetouan-Al Hoceima (TTAH) and identified which governance and design features (e.g., fairness, explainability, accessibility) translated these hiring innovations into resilient urban service delivery.

## II. POLICY AND ECOSYSTEM BACKGROUND: MOROCCO WITH A NORTHERN FOCUS

### A. National strategy

Morocco's Digital Morocco 2030 portfolio pursued two strategic axes: digitizing public services and stimulating the digital economy. These were supported by three accelerators—digital talents, cloud, and connectivity. By 2030, the strategy sought to create approximately 240,000 direct jobs and to enhance digital value-added in the economy [1].

### B. Public-sector hiring

Since 2012, the portal Emploi-public.ma centralized competitive examinations and job postings across ministries, regional administrations, and municipalities. It provided a transparent, digital entry point for recruitment in the public sector and offered a valuable dataset for analyzing hiring trends. Institutions such as the Ministry of Health increasingly used the platform to streamline recruitment, reflecting the wider adoption of e-government in HR management [4].

### C. Employment intermediation

The National Agency for the Promotion of Employment and Skills (ANAPEC) expanded its nationwide digital services. These included candidate accounts, online job postings, and free distance-learning programs designed to enhance employability. In the north, these services played a crucial role in improving labor-market matching and building digital skills among young graduates and job seekers [5].

### D. Regional assets in TTAH

The Tangier-Tetouan-Al Hoceima region consolidated its role as a strategic hub for Morocco's digital economy:

- Tanger Med Port Complex processed more than 10.2 million TEU in 2024, reinforcing its leadership in maritime trade and digital port operations. The Tanger Med Foundation also implemented training programs for youth, integrating local communities into the digital economy [6].
- Tetouan Shore became a recognized outsourcing hub for ITO, BPO, and KPO services, hosting thousands of jobs and serving as a training ground for digital recruitment pipelines [3].
- The Mohammed VI Tangier Tech City project, spanning over 2,000 hectares, advanced as a smart industrial city designed to integrate residential, industrial, and service functions while generating sustained demand for STEM and digital profiles [7].
- The Open Government Action Plan 2024–2026 for TTAH promoted transparency, civic participation, and social inclusion, thereby

aligning governance practices with fair and inclusive recruitment [8].

### E. Regulatory framework

Personal-data processing in recruitment was regulated by Law 09-08, enforced by the National Commission for the Control of the Protection of Personal Data (CNDP). This law shaped principles of consent, purpose limitation, and candidate rights, and was particularly significant as organizations began experimenting with AI-based recruitment tools [9].

## III. METHODOLOGY

### A. Research design

This study adopts a qualitative, multi-case design to explore how e-recruitment practices are shaping talent pipelines for smart-city projects in the Tangier-Tetouan-Al Hoceima (TTAH) region of northern Morocco. A qualitative approach is particularly well-suited to uncovering the perspectives of multiple stakeholders, capturing the social, organizational, and governance dimensions of digital recruitment, and analyzing the contextual realities behind policy ambitions [10].

### B. Case selection

The research relies on purposeful sampling to select five relevant cases across public, private, and hybrid domains:

1. Public administration: local and regional HR departments that use Emploi-public.ma to recruit staff for digital transformation and smart service delivery.
2. Employment intermediation: the National Agency for the Promotion of Employment and Skills (ANAPEC), which provides digital platforms, training resources, and job-matching services.
3. Smart logistics and ports: the Tanger Med Port Complex, including the Tanger Med Special Agency (TMSA) and associated firms.
4. Tech and outsourcing ecosystem: companies located in Tetouan Shore, where IT outsourcing and BPO services demand steady inflows of digital talent.
5. Strategic urban-industrial projects: stakeholders linked to the Mohammed VI Tangier Tech City, which is expected to generate long-term demand for STEM and digital profiles.

This combination of cases reflects the diversity of recruitment practices while maintaining a regional focus.

### C. Data collection

Data will be gathered using three complementary techniques:

- Semi-structured interviews: Approximately 30–40 interviews will be conducted with HR directors, recruiters, municipal officials, ANAPEC advisors, and technology project managers. Questions will focus on recruitment processes, digital platforms, challenges of skills alignment, fairness and transparency, and

compliance with Morocco's Law 09-08 on data protection [9].

- Focus groups: 2–3 focus groups with recent hires and job seekers (6–8 participants each) will capture the candidate experience with e-recruitment platforms and their perceptions of accessibility, equity, and trust.
- Document and platform analysis: Policy documents (Digital Morocco 2030, regional Open Government Action Plan), annual reports (TMSA, ANAPEC), and walkthroughs of digital platforms (Emploi-public.ma, ANAPEC portals) will be systematically analyzed to triangulate interview and focus-group data.

#### D. Data analysis

Collected data will be analyzed using thematic analysis following Braun and Clarke's (2006) six-phase framework [11]. Codes will be generated inductively to capture emerging patterns (e.g., transparency, efficiency, inclusion), then organized into broader themes linking e-recruitment capabilities to talent outcomes (time-to-hire, skills fit, diversity) and city-level value (service reliability, citizen trust). NVivo software will support the coding process and facilitate cross-case comparisons.

## IV. FINDINGS

The qualitative analysis produced four major themes that captured how e-recruitment practices shaped talent pipelines in the Tangier-Tetouan-Al Hoceima (TTAH) region: (1) fragmented channels and delays, (2) skills mismatch in strategic domains, (3) fairness and accessibility concerns, and (4) uneven compliance with data protection norms.

#### A. Fragmented channels and time-to-hire

Recruitment was reported as fragmented across multiple platforms. While Emploi-public.ma centralized postings in the public sector, private employers simultaneously relied on ANAPEC, LinkedIn, and local portals. This led to extended time-to-hire, particularly for highly technical roles. HR managers consistently noted that “identifying suitable candidates required weeks longer than anticipated.”

As shown in Figure 1, fragmentation was the most frequently mentioned challenge, cited in nearly a third of coded interview references.

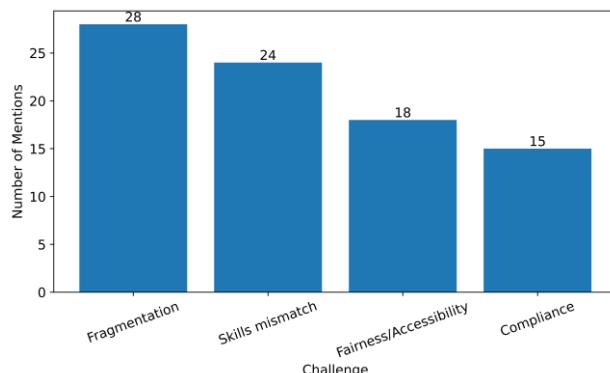


Figure 1. Frequency of reported e-recruitment challenges (number of mentions across cases).

#### B. Skills mismatch in strategic domains

Employers in both Tanger Med and Tetouan Shore highlighted a persistent skills gap. Candidates applying for port digitalization projects often lacked specific expertise in logistics data systems or operational technologies. One recruiter observed: “We receive hundreds of CVs, but only a few have real experience with maritime data systems.”

This imbalance is further illustrated in Figure 2, which shows that skills mismatch accounted for 26% of coded challenges, the second most salient theme after fragmentation.

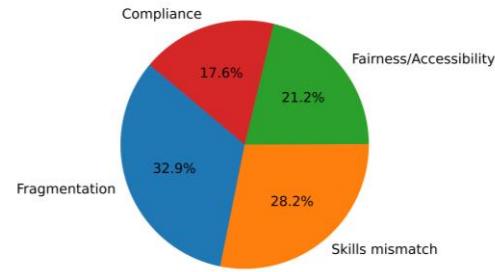


Figure 2. Distribution of reported e-recruitment challenges.

#### C. Fairness, accessibility, and trust

Candidates emphasized issues of fairness, transparency, and accessibility. While Emploi-public.ma was viewed as relatively transparent, private platforms were often perceived as opaque. Focus groups revealed that mobile-first design was essential for women and rural candidates, for whom laptops and broadband access were limited.

The demand for greater fairness was linked to Morocco's Open Government Action Plan (2024–2026), which encouraged more transparent and participatory governance practices.

#### D. Compliance and data protection

Finally, compliance with Law 09-08 on personal data protection was uneven. Public recruiters demonstrated strong adherence, routinely informing candidates about consent and retention, while private firms admitted to weaker practices—particularly when experimenting with AI-based screening. As one HR director stated: “We use algorithms to filter CVs, but we are not sure if we fully meet the consent requirements.”

#### E. Synthesis of capabilities and gaps

The four themes can be synthesized as capability strengths and weaknesses. As illustrated in Figure 3, recruitment in the TTAH region was strongest in terms of reach and access (thanks to Emploi-public.ma and ANAPEC). However, matching and assessment as well as compliance and security scored lower, reflecting gaps in skills alignment and data protection practices.

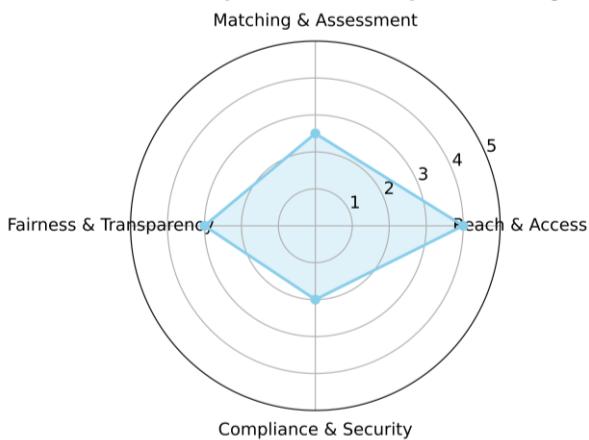


Figure 3. E-recruitment capabilities versus gaps (radar chart).

## V. DISCUSSION

The study demonstrated that e-recruitment in northern Morocco functioned as both an opportunity and a constraint in the pursuit of smart-city transformation. Four major insights emerged, each linked to the themes summarized in Table 1 and visually reinforced through Figures 1–3.

### A. Fragmentation and time-to-hire

As Figure 1 illustrated, fragmentation across recruitment channels was the most frequently cited issue. Public administrations relied primarily on Emploi-public.ma, while private firms combined ANAPEC, LinkedIn, and smaller portals. This produced redundancies and extended time-to-hire, particularly for scarce technical profiles. Such fragmentation undermined efficiency and risked slowing down smart-city projects that required rapid staffing. This finding echoed concerns in the broader literature that parallel recruitment systems often fail to provide the integration needed for dynamic labor markets [12].

### B. Persistent Skills Gaps

The second-most frequent challenge was the skills mismatch (Figure 2), particularly evident in sectors like logistics and port management at Tanger Med. Employers struggled to find candidates with applied expertise in operational technologies and data systems. Although Morocco's Digital Morocco 2030 strategy placed digital talents at its core, the northern case showed that training pipelines had not yet caught up with demand. The mismatch validated prior critiques that national digital policies must be closely aligned with local industry needs if they are to translate into employability gains [3].

### C. Fairness, accessibility, and trust

Fairness and accessibility ranked third in frequency, but their significance was amplified in focus group testimonies. Job seekers valued Emploi-public.ma's transparency but expressed frustration with private-sector opacity. Mobile-first access emerged as a prerequisite for inclusion, especially for women and rural candidates. This aligns with the Open Government Action Plan (2024–2026) in the TTAH region, which promoted equity and citizen

participation. By highlighting candidate concerns, the study underscored that e-recruitment is not only a technical process but also a governance mechanism shaping perceptions of justice.

### D. Uneven compliance with data protection

Finally, Figure 3 revealed weaknesses in compliance and security, which scored lowest in the radar chart of capabilities. Public recruiters adhered more consistently to Law 09-08 and CNDP guidelines, while private firms admitted to uncertainty when deploying AI-driven screening. This uneven application of data protection risked eroding candidate trust. The implication is that compliance training and regulatory guidance should be extended beyond the public sector to private and hybrid employers, ensuring a level playing field for ethical recruitment.

### E. Toward integrated and human-centric e-recruitment

Synthesizing across these findings, the study suggests that e-recruitment in the TTAH region was strongest in reach and access but weakest in matching and compliance (Figure 3). This asymmetry points to the need for integrated recruitment ecosystems that:

- Link public and private platforms to reduce fragmentation.
- Align training pipelines (universities, ANAPEC, Tanger Med Foundation) with sectoral needs in logistics, data, and cybersecurity.
- Institutionalize fairness by embedding transparency and mobile-first accessibility in all digital platforms.
- Strengthen compliance capacity, especially in private firms experimenting with algorithmic screening.

In short, the evidence confirmed that e-recruitment is not merely a technological tool but a strategic governance mechanism. Its design directly influenced whether Morocco's smart-city projects advanced as inclusive, trustworthy, and human-centric transformations rather than as technocratic initiatives detached from social realities.

## VI. CONCLUSION

This study examined how e-recruitment practices shaped the development of smart-talent pipelines in the Tangier-Tetouan-Al Hoceima region, situating findings within Morocco's broader Digital Morocco 2030 strategy. The results demonstrated that while reach and access to candidates were relatively strong—supported by platforms such as Emploi-public.ma and ANAPEC—critical weaknesses persisted in skills alignment, process transparency, and compliance with data protection norms. These gaps limited the capacity of local employers and administrations to efficiently staff smart-city projects in logistics, outsourcing, and urban innovation.

The findings confirmed that e-recruitment is more than a technical HR tool: it is a strategic governance mechanism that directly influences whether Morocco's digital transformation will be inclusive, trustworthy, and responsive to citizen needs. By integrating recruitment with fairness, compliance, and targeted talent development, the

northern region can transform its infrastructure gains into sustainable human capital outcomes.

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