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Measuring Digital-Nomad-Oriented Management Practices: Scale Development and Cross-Cultural Validation of DRISA

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Abstract: Digital nomadism extends remote work by combining geographic mobility, digital dependence, and cross-boundary coordination, yet research still lacks a validated measure of the management practices that make work-from-anywhere arrangements organizationally viable in practice. This study develops and validates DRISA, a five-dimensional measure of digital-nomad-oriented management practices comprising Digital Integration, Remote Collaboration, Individual Autonomy, Spatial Freedom, and Agile Management. Using an exploratory sequential mixed-methods design, we first conducted 42 semi-structured interviews to generate and refine items and then reduced an initial item pool through a pilot survey (N = 80). We subsequently validated the scale across samples from China, the United States, and Europe (main validation N = 372; pooled N = 452 including the pilot sample). Results supported a correlated five-factor structure, strong reliability and convergent validity, discriminant validity, and configural, metric, and scalar invariance across regions. In the nomological network, DRISA positively predicted psychological empowerment, perceived organizational performance, and retention intention, with empowerment providing additional explanatory value. The study contributes by operationalizing a management architecture for highly mobile knowledge work, advancing cross-cultural measurement in digital nomad research, and providing a diagnostic instrument that researchers and practitioners can use to evaluate how organizations support digital nomads while balancing autonomy, coordination, organizational control, and contextual constraints across sampled settings.

Keywords: Digital Nomadism; Management Practices; Scale Development; Cross-Cultural Validation; Psychological Empowerment

1. Introduction

1.1. The Evolution of Work-from-Anywhere

Work-from-anywhere arrangements have expanded precipitously from occasional telecommuting to sustained, highly mobile ways of working that are often described as digital nomadism [1–3]. In these settings, employees perform knowledge work while moving across cities or countries and coordinating through digital platforms rather than co-located office routines. Notwithstanding this fact, this phenomenon has shifted from being a lifestyle choice to a recognizable phenomenon in the talent market in knowledge-intensive sectors such as software development, marketing and design, consulting, and education. Prior research describes this shift as a transformation in the online gig economy in which mobility becomes a central feature of the employment relationship [1].

It's more than a distribution issue; it's ontological in nature. The geographic mobility, cross-time-zone distribution, and dependence on cyber-infrastructure change goal setting, task coordination, performance evaluation, and

employee perceptions of autonomy and belonging. Previous research argues that this new economy is driven by a search for meaningful work that decouples professional identity from physical location, while recent work further highlights the motives and lifestyle orientations that sustain digital nomadism [4,5]. Consequently, as organizations institutionalize remote and hybrid work, they increasingly confront a strategic question: what management practices enable mobile remote work to be productive, sustainable, and attractive to talent, rather than fragile and burnout-inducing?

1.2. The Managerial Challenge and Measurement Gap

A growing literature examines the consequences of remote work using established constructs such as telework intensity, job autonomy, virtuality, and HR practices. These measures are valuable but incomplete for digital nomadism and extreme work-from-anywhere contexts. First, many scales capture employee experiences (e.g., perceived autonomy) rather than the managerial and organizational practices that create those experiences. Second, existing measures rarely integrate the multi-faceted coordination problems that emerge when work is simultaneously digital, distributed, and mobile. For instance, standard telework measures often fail to account for the “lifestyle mobility” and the complex “host-guest interactions” that define the digital nomad experience in tourism destinations [6–8].

Furthermore, the integration of digital nomads into the corporate workforce challenges the traditional “social contract” of employment. Recent research suggests that digital nomads are effectively “breaking the contract” with the state and traditional employment infrastructures, necessitating new forms of governance and organizational support that extend beyond the office walls [9]. Without a dedicated instrument to measure these specific support mechanisms, researchers cannot compare results across studies, practitioners lack diagnostic tools, and theory development is constrained by inconsistent operationalizations.

1.3. Research Objectives

To address this gap, we develop and validate a multidimensional scale of Digital-Nomad-Oriented Management Practices: the DRISA scale. DRISA embodies the following five interlocking factors that define it: Digital Integration, Remote Collaboration, Individual Autonomy, Spatial Freedom, and Agile Management. It reflects the understanding that digital nomadism is more than a tourism or traveling practice, as it represents the “new HR frontier for smart business” [10].

In addition to the new variable introduced by the study, DRISA facilitates the process of theory building and application. Using the validated scale, researchers can examine the effects of varied combinations of management practices on performance, employee retention, learning, and innovation, specifically when work can be done from anywhere. Moreover, comparison across various industries and locations is possible; this is important when considering that the phenomenon of digital nomadism generates employment across national borders and national labor regulations [11]. On the management frontier, the new framework gives managers a set of words to describe goals concerning the future of work as actionable items to be improved. Based on this consideration, the basic question is: can the set of practices surrounding the phenomenon of digital nomadism be identified as a five-dimensional construct that can be tested for validity across cultures using both criterion-related and nomological validity?

Following best practices in developing measures [12], we integrate qualitative research results with quantitative validation. Study 1 employs semi-structured interviews to identify and refine a 30-item pool using 42 interviews. Study 2 employs EFA on a pilot test sample (80 participants) to validate factor structure and refine to 20 items. Study 3 employs CFA on samples across China (127 participants), the USA (125 participants), and Europe (120 participants) to compare and validate factor structure and factor loading across cultures. Study 4 relates DRISA to psychological aspects and two mobile work performance measures: perceived performance and retention intentions.

By establishing the instrument to be valid in China, the USA, and Europe, it presents a reliable instrument for future research and represents a quantitative piece of research that can now effectively supplement a field dominated by findings from a variety of quantitative and, to a greater extent, only qualitative studies. These practices are critical in that they are now being reframed by digital nomads through the dynamics of tourism success and challenges for destinations [13].

2. Conceptual Background and Construct Methods

2.1. Digital Nomadism: From Niche to Mainstream

Digital nomadism is now defined as remote work combined with both mobility and coordination through digital technology. It has shifted from a marginal phenomenon in freelancing to a “mobility regime” that sustains an “aspirational class” and has location independence as a mark of “professional capital” [14]. The phenomenon now divides the work-force between “sedentary” and “mobile” remote workers and nomads respectively.

The distinction is critical: while a remote worker may need a laptop and a Zoom account, a digital nomad requires an ecosystem that supports “holistic freedom” in both work and leisure and increasingly relies on access to flexible third-place infrastructures such as coworking environments [15–17]. This includes the ability to navigate complex “personal knowledge ecologies” to manage information across changing environments [18] and the psychological resilience to handle the blurring lines between professional output and travel experiences.

2.2. The DRISA Framework: A Management Model

We argue that effective management of this workforce is ultimately a question of management architecture. In mobile and remote work, managers have fewer opportunities for informal coordination, while employees face greater ambiguity about priorities, boundaries, and ‘how things get done.’ Effective management therefore requires practices that (a) reduce coordination costs through technology integration, (b) enable autonomy without losing alignment, (c) provide location-independent resources, and (d) maintain agility; recent remote-work research likewise highlights the joint importance of organizational context and supportive work design for work-related outcomes [19,20]. We conceptualize these needs into the DRISA model (**Figure 1**):



Figure 1. Five-Dimensional DRISA Model and Its Sub-Elements.

2.2.1. Digital Integration (D)

Digital Integration captures the interoperability and embodiment of digital support infrastructure within key management processes. Digital Integration is more than “tool access” and represents “the infrastructuring of work” characterized by digital platforms being the primary reality of the organization. Research on nomadic practices likewise shows that infrastructures for digital work that support smooth coordination and knowledge-sharing over fractured networks are a crucial part of effective digital work [21].

2.2.2. Remote Collaboration (R)

Remote Collaboration refers to the organization’s ability to adapt coordination and support practices to remote constraints such as time-zone dispersion and asynchronous collaboration. This dimension is critical for overcoming the lack of physical visibility and requires what can be described as attentional leadership—leaders who can

manage the focus and engagement of dispersed teams without resorting to surveillance [22]. The set of norms includes documentation, asynchronous handovers, and virtual socialization, which can substitute for the water cooler and support remote work effectiveness and vigor [23,24].

2.2.3. Individual Autonomy (I)

Individual Autonomy refers to management's level that promotes autonomous work practices and schedules. For digital nomads, autonomy is a core psychological need [25]. Autonomy is important in work transformation to counter loneliness and exhaustion. Here in DRISA, autonomy is an enabling process rather than an absence of control and is reflected in results-oriented arrangements that strengthen self-leadership, choice, and performance under remote work [26,27].

2.2.4. Spatial Freedom (S)

Aspects of Spatial Freedom include organizational support regarding location independence and overcoming location-based inequalities. It addresses the freedom trap that nomads try to evade through mobility and destination integrity [9]. Safety and connectivity were identified as essential factors in destination choices [28], and companies that provide access to verified safe workation locations, coworking alternatives, or insurance support are likely to reduce location-related frictions [16,17]. Destination-related evidence further shows that digital nomads evaluate places through support conditions such as connectivity and local infrastructure [29].

2.2.5. Agile Management (A)

Agile Management sustains speed and learning even in uncertainty. Agile methods allow a quick pivot even without going through formal approval from the top, necessary since team members work across different time zones, thus not possible to meet at short notice. Agile Management recommends a startup mentality, which involves quick iteration and self-organization, especially among digital nomads who work in a dynamic environment that involves uncertainty [30].

2.3. Methods: Exploratory Sequential Mixed Methods Design

For the development and validation of the Digital-Nomad-Oriented Management Practices (DRISA) scale, an exploratory sequential mixed methods study was conducted [31]. Due to the infancy stage and the ambiguous nature of the theory in digital nomad management, it is appropriate to have the initial stage qualitative in nature and the second stage as quantifiable [32]. Based upon established guidelines for scale development [12,33], the process encompasses four stages.

During the qualitative study (Study 1), we employed semi-structured in-depth interviews with the aim of gathering information from 42 managers and digital nomads who have rich experiences in remote working. Our sample included participants from different organizations in China, the USA, and European countries with the aim of increasing variability. For the study, we used systematic coding [34]. Based on open, axial, and aggregate coding, we established the first five constructs: Digital Integration, Remote Collaboration, Individual Autonomy, Spatial Freedom, and Agile Management. Based on the results, we developed an item pool of 30 items with established content validity through the use of expert checks (**Appendix A**).

Moving on to the scale purification stage (Study 2), the first scale was tested on N = 80 participants. Exploratory Factor Analysis (EFA) on SPSS (Principal Axis Factoring with Varimax rotation) indicated a good scale and a five-factor solution that accounted for 81.47% of the total variance. Based on factor loadings and cross-loading, items were further pruned to retain 20 items (**Appendix B**).

Then, during the confirmation and validation stage (Study 3), we analyzed a main validation sample of N = 372 across China (N = 127), the United States (N = 125), and Europe (N = 120), and used the pooled dataset including the pilot sample (N = 452) for selected supplementary analyses. Confirmatory Factor Analysis (CFA) with AMOS indicated that the correlated five-factor model showed good fit and performed substantially better than alternative structures, including the one-factor model. Reliability and convergent validity statistics met recommended thresholds, and cross-regional comparability was further supported by Tucker's congruence coefficients and multi-group invariance tests.

In Study 4, DRISA was positioned within a nomological network. Regression analyses showed positive associations with psychological empowerment, perceived organizational performance, and retention intention. Taken together, the mixed-methods approach provides initial evidence that DRISA is a reliable and useful instrument for cross-regional research within the sampled contexts, while leaving room for further validation in additional industries and regulatory environments.

3. Scale Development and Validation Results

A conventional process of scale development and validation [12,33] was applied. In Study 1, items were developed through qualitative research with interviews and grounded coding. Study 2 involved piloting the survey in order to test dimensionality by exploratory Factor Analysis. Study 3 carried out CFA testing in three different cultural environments for validation of the scale. Study 4 assessed nomological and criterion-related validity by testing theoretically derived relationships with psychological empowerment and organizational outcomes.

3.1. Study 1: Qualitative Item Generation and Content Refinement

Time: The qualitative interviews for Study 1 were conducted between March and June 2025. This timing is important because it captures digital nomadism in a mature post-pandemic phase, when remote work infrastructures and collaboration platforms had become normalized rather than crisis-driven.

Purpose: The goal of Study 1 was to develop a comprehensive item pool that captures how organizations manage digital nomad and work-from-anywhere arrangements. We prioritized practices that are under managerial or organizational control, rather than purely individual experiences.

Data collection: We conducted 42 semi-structured interviews with individuals who had experience working remotely with high mobility (e.g., frequently changing locations, working across regions) as well as managers overseeing such work. Interviews focused on concrete management practices: how work is coordinated across tools and time zones; how autonomy is granted and monitored; how location changes are supported; how teams maintain alignment and adapt; and what practices respondents perceived as enabling or hindering productivity and retention. Interviews were conducted online, typically lasting 45–75 min. With participant consent, interviews were recorded and transcribed.

Coding and construct emergence: Researchers coded a subset of transcripts to develop an initial codebook. We employed an iterative process of comparative coding: open coding for important practices and challenges, axial coding to code key concepts into higher-order categories, and selective coding for the compilation of themes. Disputes were resolved through discussions until consensus. This led to the establishment of five recurring domains evident in the different dimensions of the DRISA.

Item development and refinement: We developed 30 items (six for each dimension) using domain guidelines for scale development: brief, one-idea-per-statement items with no double-barreled items or too much jargon. The items were evaluated for representativeness, understandability, and redundancy by two expert groups (management/IS researchers and remote/mobile knowledge workers). We addressed understandability by making items describe practices (not outcomes) and removing redundant items. The 30 items proceeded for quantitative testing.

3.2. Study 2: Pilot Survey and Exploratory Factor Analysis (EFA)

Time: The pilot survey for Study 2 was administered in October 2025.

Purpose and Sample: Study 2 examined the latent structure of the 30-item pool and factor-reduced a parsimonious set of items to capture each dimension. A pilot sample of size $N = 80$ with remote/mobile knowledge work experience was obtained.

Common method considerations: We reduced potential common method bias ex ante through practice-focused item wording, translation-back-translation, attention checks, completion-time screening, and exclusion of straight-lining responses. Additional ex post diagnostic evidence is reported in Section 3.5.

Variables and procedures: Participants evaluated the 30 items using a seven-point Likert scale. We checked for completion/consistency and retained those with usable DRISA data.

Methodological approach: The KMO index and Bartlett's test allowed us to ascertain factorability. Analysis included principal axis factor analysis with varimax rotation and specified five factors grounded in qualitative find-

ings and constructs. Item retention included: main factor loading above 0.50 on specified factor, constrained cross-loading, and conceptual separation. When these criteria differed, we selected items corresponding to novel practices with superior managerial meaningfulness and understanding.

Results: The pilot data supported factor analysis (KMO = 0.819; Bartlett's $\chi^2 = 2,706.219$, $p < 0.001$). The five-factor solution explained 81.47% of the total variance (**Table 1**). The rotated solution showed a clear simple structure: Agile Management items loaded strongly on Factor 1, Spatial Freedom on Factor 2, Digital Integration on Factor 3, Individual Autonomy on Factor 4, and Remote Collaboration on Factor 5. Based on loading strength, redundancy diagnostics, and content representativeness, we refined the instrument to four items per dimension, producing the DRISA-20 scale used in Study 3.

Table 1. Exploratory factor analysis (pilot sample, N = 80): Factor variance explained.

Factor	Eigenvalue	Proportion of Variance	Cumulative Variance
F1	5.092	16.97%	16.97%
F2	5.372	17.91%	34.88%
F3	4.286	14.29%	49.17%
F4	5.034	16.78%	65.95%
F5	4.655	15.52%	81.47%

Note: Principal-axis extraction with varimax rotation; DRISA-30 items. The rotated loading matrix is reported in **Appendix C**.

3.3. Study 3: Confirmatory Factor Analysis (CFA) and Cross-Cultural Validation

Time: The main validation survey used in Studies 3 and 4 was administered between November and December 2025, and the final dataset was cleaned and finalized in December 2025. This timing places the validation stage firmly in the post-pandemic period, allowing the DRISA framework to reflect relatively mature and institutionalized digital nomad management practices rather than emergency remote-work adaptations.

Purpose: Study 3 aimed to validate the DRISA-20 measurement model and assess its applicability across cultural contexts. Because work-from-anywhere arrangements often span national boundaries, cross-cultural evidence is critical for both research accumulation and practice benchmarking.

Samples and procedure: We collected three validation samples from China (N = 127), the United States (N = 125), and Europe (N = 120), yielding a main validation sample of N = 372. To increase robustness of pooled analyses, we also retained the pilot sample (N = 80) as a supplementary dataset, resulting in a full pooled dataset of N = 452 used for selected analyses. Respondents represented a range of work arrangements (remote, hybrid, and on-site) and roles (employees, managers, and founders/executives). **Table 2** reports the main sample profile.

Table 2. Sample profile (main validation sample, N = 372).

Characteristic	China (N = 127)	USA (N = 125)	Europe (N = 120)	Total (N = 372)
Gender				
Female	52 (40.9%)	60 (48.0%)	51 (42.5%)	163 (43.8%)
Male	75 (59.1%)	65 (52.0%)	69 (57.5%)	209 (56.2%)
Age				
20–29	53 (41.7%)	45 (36.0%)	41 (34.2%)	139 (37.4%)
30–39	50 (39.4%)	56 (44.8%)	51 (42.5%)	157 (42.2%)
40–49	19 (15.0%)	19 (15.2%)	22 (18.3%)	60 (16.1%)
50+	5 (3.9%)	5 (4.0%)	6 (5.0%)	16 (4.3%)
Education				
High School	4 (3.1%)	6 (4.8%)	6 (5.0%)	16 (4.3%)
Associate	23 (18.1%)	24 (19.2%)	24 (20.0%)	71 (19.1%)
Bachelor	62 (48.8%)	61 (48.8%)	60 (50.0%)	183 (49.2%)
Master+	38 (29.9%)	34 (27.2%)	30 (25.0%)	102 (27.4%)
Company size				
Large	39 (30.7%)	45 (36.0%)	34 (28.3%)	118 (31.7%)
Medium	48 (37.8%)	43 (34.4%)	48 (40.0%)	139 (37.4%)
Small	40 (31.5%)	37 (29.6%)	38 (31.7%)	115 (30.9%)
Work arrangement				
Hybrid	61 (48.0%)	58 (46.4%)	61 (50.8%)	180 (48.4%)
On-site	35 (27.6%)	35 (28.0%)	26 (21.7%)	96 (25.8%)
Remote	31 (24.4%)	32 (25.6%)	33 (27.5%)	96 (25.8%)
Role				
Employee	95 (74.8%)	98 (78.4%)	79 (65.8%)	272 (73.1%)
Founder/Exec	13 (10.2%)	6 (4.8%)	15 (12.5%)	34 (9.1%)
Manager	19 (15.0%)	21 (16.8%)	26 (21.7%)	66 (17.7%)

Table 2. *Cont.*

Characteristic	China (N = 127)	USA (N = 125)	Europe (N = 120)	Total (N = 372)
Digital nomad experience				
<1 year	34 (26.8%)	38 (30.4%)	40 (33.3%)	112 (30.1%)
1–3 years	73 (57.5%)	70 (56.0%)	62 (51.7%)	205 (55.1%)
>3 years	20 (15.7%)	17 (13.6%)	18 (15.0%)	55 (14.8%)

Model specification and estimation: We specified a correlated five-factor CFA model in which each DRISA dimension was measured by four items. Model fit was evaluated using χ^2 , χ^2/df , CFI, TLI, and RMSEA, following commonly used guidelines [35]. We compared the hypothesized model to alternative factor structures (one- through four-factor) to assess whether the five dimensions are empirically distinguishable. We assessed reliability using Cronbach's α and composite reliability (CR). Convergent validity was assessed via average variance extracted (AVE). Discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT) [36].

Results: In the full pooled dataset (N = 452), the correlated five-factor model demonstrated good fit ($\chi^2 = 397.16$, $\text{df} = 160$, $\chi^2/\text{df} = 2.48$, CFI = 0.966, TLI = 0.960, RMSEA = 0.057). The model also fit well in the main pooled sample (N = 372; **Table 3**). Competing models exhibited substantially worse fit (**Table 4**), supporting the distinctiveness of the five dimensions.

Table 3. Confirmatory factor analysis (DRISA-20): Model fit indices.

Sample	N	χ^2	df	χ^2/df	CFI	TLI	RMSEA
China	127	359.57	160	2.25	0.893	0.946	0.099
USA	125	241.13	160	1.51	0.966	0.952	0.064
Europe	120	255.22	160	1.60	0.947	0.956	0.071
Main pooled	372	370.70	160	2.32	0.962	0.959	0.060
Full pooled (incl. pilot)	452	397.16	160	2.48	0.966	0.960	0.057

Note: Correlated five-factor CFA. CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation.

Table 4. Model comparisons for DRISA-20 (full pooled sample, N = 452).

Model	χ^2	df	CFI	TLI	RMSEA
One-factor	6,072.24	170	0.157	0.058	0.277
Two-factor	4,580.70	169	0.370	0.292	0.241
Three-factor	3,155.10	167	0.573	0.515	0.199
Four-factor	2,042.14	164	0.732	0.689	0.159
Five-factor	397.16	160	0.966	0.960	0.057

Note: The hypothesized five-factor model provides substantially better fit than all alternative structures.

Standardized loadings were strong across constructs, ranging from 0.707 to 0.949. Reliability and convergent validity were robust (**Table 5**): α ranged from 0.890 to 0.939, CR ranged from 0.893 to 0.939, and AVE ranged from 0.679 to 0.795. HTMT values were all below 0.18 (**Table 6**), supporting discriminant validity.

Table 5. Reliability and convergent validity (DRISA-20, full pooled sample, N = 452).

Construct	Std. Loading Range	Cronbach's α	CR	AVE
Digital Integration	0.707–0.949	0.890	0.893	0.679
Remote Collaboration	0.764–0.883	0.896	0.900	0.692
Individual Autonomy	0.800–0.901	0.925	0.926	0.759
Spatial Freedom	0.819–0.922	0.931	0.931	0.772
Agile Management	0.821–0.924	0.939	0.939	0.795

Note: CR = composite reliability; AVE = average variance extracted.

Table 6. Discriminant validity (HTMT, DRISA-20, full pooled sample, N = 452).

	Digital Integration	Remote Collaboration	Individual Autonomy	Spatial Freedom	Agile Management
Digital Integration	1.000	0.043	0.060	0.055	0.043
Remote Collaboration	0.043	1.000	0.038	0.108	0.060

Table 6. *Cont.*

	Digital Integration	Remote Collaboration	Individual Autonomy	Spatial Freedom	Agile Management
Individual Autonomy	0.060	0.038	1.000	0.175	0.040
Spatial Freedom	0.055	0.108	0.175	1.000	0.032
Agile Management	0.043	0.060	0.040	0.032	1.000

Note: HTMT values below 0.85 (or 0.90) indicate discriminant validity.

Cross-cultural similarity: As an initial assessment of cross-cultural similarity, we computed Tucker's congruence coefficients based on standardized loading patterns across China, the US, and Europe. All coefficients exceeded 0.98 (**Table 7**), indicating highly similar loading structures and supporting DRISA's use in cross-cultural comparisons [37,38].

Table 7. Cross-cultural loading congruence (Tucker's ϕ) across regions.

Construct	China-USA	China-Europe	USA-Europe	Minimum ϕ
Digital Integration	0.991	0.986	0.989	0.986
Remote Collaboration	0.996	0.991	0.990	0.990
Individual Autonomy	0.997	0.982	0.987	0.982
Spatial Freedom	0.998	0.996	0.998	0.996
Agile Management	0.992	0.991	1.000	0.991

Note: Tucker's ϕ values above 0.95 indicate strong factorial similarity.

Measurement invariance: To ensure cross-cultural comparability of the DRISA-20, we conducted multi-group confirmatory factor analyses [39] across the China ($n = 127$), U.S. ($n = 125$), and Europe ($n = 120$) samples, testing configural, metric (equal factor loadings), and scalar (equal loadings and item intercepts) invariance. Using recommended change-in-fit criteria ($\Delta CFI \leq 0.01$; $\Delta RMSEA \leq 0.015$) [40,41], results supported configural invariance ($CFI = 0.938$, $RMSEA = 0.046$, $SRMR = 0.058$), metric invariance ($\Delta CFI = -0.004$, $\Delta RMSEA = 0.000$), and scalar invariance ($\Delta CFI = -0.003$, $\Delta RMSEA = -0.000$) (see **Table 8**), indicating that DRISA-20 scores can be meaningfully compared across the three regions.

Table 8. Measurement invariance tests across regions (DRISA-20).

Model	χ^2	df	CFI	TLI	RMSEA	SRMR	ΔCFI	$\Delta RMSEA$
Configural	849.03	480	0.938	0.927	0.046	0.058		
Metric (loadings)	904.77	510	0.934	0.926	0.046	0.059	-0.004	0.000
Scalar (loadings + intercepts)	953.92	540	0.931	0.927	0.045	0.059	-0.003	-0.000

Note: $N_{total} = 372$; configural = unconstrained; metric = loadings constrained; scalar = loadings and intercepts constrained. Δ values are changes from the preceding model.

3.4. Study 4: Nomological Network and Criterion-Related Validity

Purpose: Beyond psychometric adequacy, a new scale should demonstrate that it behaves as expected within a broader theoretical network. We therefore examined whether DRISA predicts psychological empowerment and downstream organizational outcomes that are salient in digital-nomad contexts, where retention and perceived organizational effectiveness are strategic concerns.

Measures: Psychological empowerment was measured using five items capturing meaning, competence, autonomy, and impact. Perceived organizational performance was measured using five items capturing comparative innovation speed, decision efficiency, and performance advantages. Retention intention was measured using five items capturing intent to stay and commitment. All items used a seven-point agreement scale.

Controls and estimation: We computed scale scores as the mean of their items. DRISA was operationalized as the mean of the five dimension scores. We estimated OLS regressions with standardized variables and included controls for gender, age, education, company size, work arrangement, role, and region. We assessed mediation using nonparametric bootstrap confidence intervals for the indirect effect (5,000 resamples).

Results: DRISA positively predicted psychological empowerment ($\beta = 0.411$, $p < 0.001$). DRISA also predicted perceived organizational performance ($\beta = 0.487$, $p < 0.001$) and retention intention ($\beta = 0.405$, $p < 0.001$). When

empowerment was included, DRISA's direct effects remained significant, and empowerment provided incremental predictive validity for organizational performance ($\beta = 0.099$, $p = 0.045$) and retention intention ($\beta = 0.154$, $p = 0.002$) (**Table 9**, **Figure 2**). Bootstrap results indicated a small positive indirect effect through empowerment on organizational performance (median = 0.041; 95% CI [-0.001, 0.091]) and a stronger indirect effect on retention intention (median = 0.062; 95% CI [0.021, 0.105]). These results provide initial support for criterion-related validity and suggest empowerment as a plausible mechanism linking digital-nomad-oriented management practices to performance and retention perceptions; this pattern is also consistent with recent evidence that psychological empowerment can strengthen organizational performance mechanisms [42] (**Appendix D**).

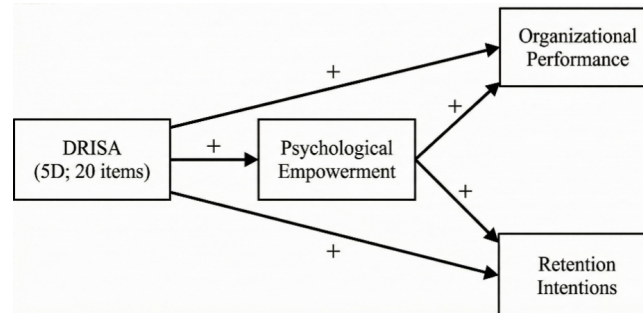


Figure 2. Nomological network used for criterion-related validity tests.

Table 9. Nomological validity tests (standardized coefficients; full pooled sample, N = 452).

Specification	DV	Predictor	β	SE	p
PE	PE	DRISA	0.411	0.048	<0.001
OP (direct)	OP	DRISA	0.487	0.045	<0.001
OP (with PE)	OP	DRISA	0.447	0.050	<0.001
OP (with PE)	OP	PE	0.099	0.050	0.045
RI (direct)	RI	DRISA	0.405	0.046	<0.001
RI (with PE)	RI	DRISA	0.342	0.050	<0.001
RI (with PE)	RI	PE	0.154	0.050	0.002

Note: DV = Dependent Variable; PE = Psychological Empowerment; OP = Organizational Performance; RI = Retention Intention. All models include controls for gender, age, education, company size, work arrangement, role, and region.

3.5. Supplementary Heterogeneity and Robustness Checks

To assess potential respondent heterogeneity and provide additional robustness evidence, we conducted supplementary analyses by gender, age, digital nomad experience, and common method bias. Because income was not collected in the questionnaire, socioeconomic heterogeneity could not be examined directly. In the main validation sample (N = 372), independent-samples t -tests showed no significant gender differences in DRISA, psychological empowerment, perceived organizational performance, or retention intention (all $p > 0.27$), with negligible effect sizes ($|d| \leq 0.115$) (**Table 10**).

Table 10. Gender differences in key variables (main validation sample, N = 372).

Variable	Male Mean (SD)	Female Mean (SD)	t	p	Cohen's d
DRISA	4.75 (0.45)	4.80 (0.46)	-1.015	0.311	-0.106
PE	4.81 (0.82)	4.85 (0.86)	-0.475	0.635	-0.050
OP	4.97 (1.14)	4.93 (1.11)	0.349	0.727	0.036
RI	3.35 (0.94)	3.46 (0.93)	-1.098	0.273	-0.115

Note: Gender differences were assessed using independent-samples t -tests. Effect sizes are negligible across all focal variables.

One-way ANOVA tests across the four age groups (20–29, 30–39, 40–49, and 50+) likewise showed no significant differences for DRISA ($F = 0.221$, $p = 0.882$, $\eta^2 = 0.002$), psychological empowerment ($F = 0.190$, $p = 0.903$, $\eta^2 = 0.002$), or retention intention ($F = 0.374$, $p = 0.772$, $\eta^2 = 0.003$). A small but statistically significant difference emerged only for perceived organizational performance ($F = 3.772$, $p = 0.011$, $\eta^2 = 0.030$), with Tukey HSD post-hoc tests indicating that the 40–49 group reported lower perceived organizational performance than both the 20–29

group ($p = 0.008$) and the 30–39 group ($p = 0.020$) (**Table 11**). Taken together, these results suggest that the core variables in the nomological network are not systematically driven by basic demographic composition, although a limited age-related difference may exist in perceived organizational performance.

Table 11. Age-group differences in key variables (main validation sample, $N = 372$).

Variable	20–29 Mean (SD)	30–39 Mean (SD)	40–49 Mean (SD)	50+ Mean (SD)	F	p	η^2
DRISA	4.77 (0.50)	4.78 (0.41)	4.73 (0.43)	4.82 (0.50)	0.221	0.882	0.002
PE	4.81 (0.84)	4.85 (0.82)	4.77 (0.83)	4.89 (1.00)	0.190	0.903	0.002
OP	5.08 (1.13)	5.02 (1.13)	4.53 (1.10)	4.81 (0.87)	3.772	0.011	0.030
RI	3.39 (0.93)	3.42 (0.95)	3.30 (0.97)	3.53 (0.67)	0.374	0.772	0.003

Note: Age differences were assessed using one-way ANOVA across four groups. Tukey HSD post-hoc tests indicated that the 40–49 group reported lower OP than both the 20–29 group ($p = 0.008$) and the 30–39 group ($p = 0.020$).

We further examined digital nomad experience as a proxy grouping variable for stage-of-adaptation differences. Respondents were divided into three groups: less than 1 year ($n = 112$), 1–3 years ($n = 205$), and more than 3 years ($n = 55$) of digital nomad experience. Across all three groups, DRISA remained a positive and statistically significant predictor of psychological empowerment ($\beta = 0.385, 0.424$, and 0.402 , respectively), perceived organizational performance ($\beta = 0.460, 0.495$, and 0.485 , respectively), and retention intention ($\beta = 0.361, 0.418$, and 0.397 , respectively). Although these supplementary analyses cannot substitute for true longitudinal evidence, they provide indirect support that the observed associations are not confined to only novice or only highly experienced digital nomads.

Common method bias diagnostic: Because the nomological analyses relied on self-reported focal constructs, we conducted an additional common method bias diagnostic on the full pooled dataset ($N = 452$). Harman’s single-factor test showed that the first unrotated factor accounted for 22.61% of the variance, and nine factors had eigenvalues greater than 1 (**Table 12**). Together with the poor fit of the one-factor CFA reported in **Table 4**, this pattern suggests that common method variance is unlikely to fully account for the observed relationships.

Table 12. Harman’s single-factor test (full pooled sample, $N = 452$).

Statistic	Value
Number of items entered	35
First unrotated factor explained variance	22.61%
Number of factors with eigenvalue > 1	9

4. Discussion and Implications

This research develops and validates DRISA, a measure of digital-nomad-oriented management practices that organizations can use to assess and improve work-from-anywhere readiness. By grounding the construct in qualitative evidence and validating it across multiple samples, we provide an instrument that responds to an increasingly important managerial reality: distributed work is no longer defined solely by “working from home,” but by mobility, platform dependence, and temporal dispersion that require a coherent set of management practices.

The DRISA scale has at least two roles in research. In particular, it provides insight into the practice domains involved in digital nomad work in terms of technology integration (Digital Integration), adaptation of coordination and mobility (Remote Collaboration), freedom of autonomy with accountability (Individual Autonomy), location-independent support and resource access (Spatial Freedom), and agile coordination under mobility (Agile Management). Second, DRISA offers a tool for building cumulative empirical knowledge. Researchers can use DRISA to compare organizations, to test how management practices shape well-being and performance under work-from-anywhere conditions, and to examine how digital infrastructures interact with managerial routines.

Cross-cultural evidence suggests that DRISA captures a comparable measurement structure across the sampled regions rather than universal equivalence across all contexts. The supported configural, metric, and scalar invariance results justify cross-regional comparison within China, the United States, and Europe, but further validation is still needed in more heavily regulated industries and in countries with stricter labor or data-governance regimes.

The nomological results provide initial evidence of criterion-related validity. DRISA relates positively to psychological empowerment and to two practical outcomes: perceived organizational performance and retention intention. At the same time, these associations should not be interpreted as mechanically high simply because the study relies on perceptions. Several focal constructs, especially psychological empowerment and retention intention, are theoretically defined at the perceptual level. More importantly, empowerment is conceptually meaningful here because DRISA practices are expected to shape how supported, autonomous, and capable employees feel in highly mobile work settings. This interpretation is also consistent with recent work that positions psychological empowerment as a meaningful mediating mechanism between leadership practices and employee innovation [43]. Nevertheless, shared method variance may still inflate some coefficients, so the findings should be read as initial perceptual evidence rather than definitive causal estimates.

4.1. The Employer's Dilemma: Balancing Autonomy with Governance

From a managerial standpoint, stronger DRISA scores are not automatically or uniformly desirable in every setting. For example, Digital Integration may improve visibility, coordination, and data-based decision making, yet greater use of AI-enabled tools can also raise concerns about data leakage, intellectual property exposure, and compliance with internal security policies. Likewise, Remote Collaboration routines such as asynchronous coordination and time-zone-sensitive meetings are highly valuable in distributed knowledge work, but they may be harder to implement in synchronous service operations, tightly regulated sectors, or environments with heavy client confidentiality requirements. The managerial implication is therefore not that firms should maximize every DRISA dimension indiscriminately, but that they should calibrate these practices to task interdependence, security sensitivity, and industry regulation.

4.2. Boundary Conditions and Respondent Heterogeneity

DRISA is best interpreted as a context-sensitive portfolio of management practices. The scale can help organizations diagnose where their work-from-anywhere systems are strong or weak, but the practically optimal profile may differ across occupations, legal environments, and employee subgroups. In the present data, the supplementary analyses suggest that the core relationships are reasonably robust across gender and across digital nomad experience stages, while a limited age-related difference emerged only for perceived organizational performance. Recent remote-work research also shows that work intensity and basic-need satisfaction are linked to turnover intention in knowledge work [44]. Complementary digital nomad studies further show that workation experiences, destination-level support systems, socio-cultural adaptation during cross-border transitions, and work-leisure management practices shape how mobile workers experience organizational arrangements [45–48]. This broader evidence reinforces our argument that DRISA should be used as a diagnostic framework rather than as a one-size-fits-all prescription. Parallel hybrid-work evidence indicates that adaptive outcomes in distributed settings depend in part on leadership-enabled knowledge sharing and employee agility [49].

5. Limitations and Conclusions

The study has several limitations. First, the criterion variables are perceptual and the survey design is cross-sectional, so the findings should be interpreted as patterned associations rather than causal effects. Although we added a Harman single-factor diagnostic and supplementary heterogeneity analyses, including digital nomad experience as a proxy grouping variable, these checks do not substitute for true longitudinal or multi-source designs. Second, the main validation sample ($N = 372$) spans China, the United States, and Europe, but it does not capture the full diversity of industries, legal settings, or employment arrangements in digital nomad work. Third, income was not collected in the questionnaire, which prevented direct assessment of socioeconomic heterogeneity. Broader reviews of digital nomadism likewise suggest that place-based, mobility, and infrastructure conditions remain important boundary conditions that future studies should model more explicitly [50]. Fourth, the small age-related difference observed for perceived organizational performance suggests that some perceptions may vary modestly across career stage or coordination burden, which future research should examine more systematically.

Despite these limitations, DRISA offers a parsimonious, psychometrically supported measure that can accelerate research on work-from-anywhere arrangements and inform managerial diagnosis. Its practical value lies not

in maximizing every dimension indiscriminately, but in helping organizations calibrate autonomy, coordination, security, and mobility support to the demands of their specific context. As organizations continue to experiment with distributed and mobile work architectures, DRISA provides a structured basis for assessing which management practices make digital nomad work more viable, comparable, and governable. This practical emphasis on calibrated support is also consistent with recent evidence that psychological empowerment is associated with stronger engagement and lower intention to leave [51].

Author Contributions

Conceptualization, W.S.; methodology, W.S.; formal analysis, W.S.; investigation, W.S.; data curation, W.S.; writing—original draft preparation, W.S.; writing—review and editing, W.S. and W.Z.; visualization, W.S.; supervision, I.K. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study. Written informed consent for publication was not applicable.

Data Availability Statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions.

Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

As the authors are non-native English speakers, during the preparation of this manuscript, they used AI-assisted language support (ChatGPT) to improve readability and linguistic accuracy. ChatGPT was used exclusively for translation assistance, grammatical correction, and language polishing. No AI tools were used to generate the scientific concepts, data, analyses, interpretations, or conclusions of this research. The authors carefully reviewed and revised the final manuscript and take full responsibility for the accuracy and integrity of its content.

Appendix A. DRISA-30 Items (Original Item Pool)

Digital Integration

- D1. Our company has reached a high level of integration and data interoperability between platforms.
- D2. Digital infrastructure is strong and allows easy access to central resources everywhere.
- D3. Applications of AI in management activities aim at eliminating tedious work.
- D4. The management system implements algorithms that help to achieve fair and efficient allocation of resources.
- D5. Real time data analysis plays a significant role in key decision-making, not only in intuition.
- D6. The digital platforms offer visual feedback or dashboards to adjust strategy in real time.

Remote Collaboration

- R1. Team culture is more advanced with respect to asynchronous communication.
- R2. Standardized documentation processes ensure that there are no information gaps.

R3. The Company establishes a sense of unity based on online social activities.

R4. Trust can be earned through delivering results regardless of not having the presence of a face-to-face interaction.

R5. The processes take into consideration time zones, (e.g., follow-the-sun workflow).

R6. The meetings and deadlines take into consideration the member time zones to prevent fatigue.

Individual Autonomy

I1. I am autonomous to choose procedures after goals are set.

I2. The company encourages developing self-leadership.

I3. I am able to plan my work with flexibility and depending on my energy levels.

I4. Flexibility between work life and personal life is also accepted provided that they generate results.

I5. The evaluation of performance should focus on results, not how many hours are spent online.

I6. If the goals are achieved, location and time taken will not influence evaluations.

Spatial Freedom

S1. Location independence is explicitly supported by policy worldwide.

S2. The fact that locations change does not mean that it affects the promotion or career development.

S3. Equitable resource access irrespective of location.

S4. Cloud-based sharing does not hinder information barriers on geographies.

S5. Diverse cultural perspectives are perceived as sources of innovations.

S6. Management will assist in solving the conflict caused by the cultural differences between people.

Agile Management

A1. The short decision chains enable the quick market response.

A2. Frontline employees are given the power to take action when not waiting for approval.

A3. The flat structure permits rapid creation of cross-functional teams.

A4. We use both project-based and/or tribe based working to remove silos.

A5. Retrospectives and iterations are frequent and help to optimize workflow.

A6. Continuous evolution is facilitated by advocating a fail-fast culture.

Appendix B. DRISA-20 Items (Final Scale)

Instruction: Please indicate your agreement with each statement. (1 = strongly disagree; 7 = strongly agree).

Digital Integration

D1. We have established deep integration and interoperability of data between the platforms.

D2. AI can be used to manage processes within business operations, such as automating repetitive work.

D3. The important choices are made mainly with the help of the analysis of the actual data and not based on mere intuition.

D4. The digital platforms offer visual feedback/dashboards to make adjustments of the strategy in real time.

Remote Collaboration

R1. The team has developed an advanced form of asynchronous communications culture.

R2. Company establishes the bond with the help of online social events.

R3. Trust is based on results despite the absence of personal communication.

R4. The respect of meeting participants, as well as their time zones, should be observed to avoid fatigue.

Individual Autonomy

I1. The method is up to me as long as I know the objectives.

I2. I will be able to adjust work schedules based on how my energy levels behave.

I3. Performance evaluation is based on outcomes rather than online hours.

I4. Evaluation does not depend on the location and time spent if the desired goals are achieved.

Spatial Freedom

S1. Policy explicitly promotes location independence worldwide.

S2. Resources should be available on an equal basis irrespective of location.

S3. The diverse cultural perspectives are viewed as a source of innovations.

S4. Management can help resolve cross-cultural conflicts.

Agile Management

- A1. This implies that short decision chains help respond to the market more quickly.
 A2. Flat structure enables the formation of cross-functional teams fast.
 A3. Frequent retrospectives and iterations help optimize the work flows.
 A4. A fail-fast culture should be promoted to enable a constant evolution.

Appendix C

Table A1. Efa Rotated Factor Loadings (Pilot Sample, N = 80).

Item	F1	F2	F3	F4	F5
D1			0.919		
D2			0.670		
D3			0.849		
D4			0.715		
D5			0.919		
D6			0.906		
R1					0.899
R2					0.894
R3					0.820
R4					0.857
R5					0.835
R6					0.869
I1				0.898	
I2				0.822	
I3				0.940	
I4				0.865	
I5				0.932	
I6				0.934	
S1		0.949			
S2		0.947			
S3		0.883			
S4		0.939			
S5		0.945			
S6		0.953			
A1	0.930				
A2	0.879				
A3	0.906				
A4	0.904				
A5	0.927				
A6	0.915				

Note: Loadings < 0.30 are suppressed for readability.

Appendix D

Table A2. Descriptive Statistics and Correlations (Full Pooled Sample, N = 452).

#	Construct	Mean (SD)	1	2	3	4	5	6	7	8	9
1	D	4.78 (0.99)	-								
2	R	4.84 (1.02)	-0.025	-							
3	I	4.76 (1.06)	-0.026	0.035	-						
4	S	4.86 (1.02)	-0.038	-0.105	0.098	-					
5	A	4.73 (1.01)	0.049	0.064	0.007	-0.026	-				
6	DRISA (overall)	4.79 (0.46)	0.412	0.429	0.512	0.415	0.482	-			
7	PE	4.83 (0.84)	-0.048	-0.001	0.545	0.058	0.388	0.427	-		
8	OP	4.95 (1.13)	0.194	0.217	0.344	0.114	0.304	0.523	0.324	-	
9	RI	3.39 (0.91)	-0.041	0.275	0.295	0.258	0.118	0.406	0.294	0.176	-

Note: D = Digital Integration; R = Remote Collaboration; I = Individual Autonomy; S = Spatial Freedom; A = Agile Management; PE = Psychological Empowerment; OP = Organizational Performance; RI = Retention Intention; SD = Standard Deviation. Correlations are Pearson correlations among construct means. The diagonal is omitted. Means and SDs are based on 1–7 Likert scales.

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