Psychological Foundations & Measurement Scales

Understanding human needs and validated instruments for Information Systems design and evaluation

Course: Understanding User Behavior for Decision-Making

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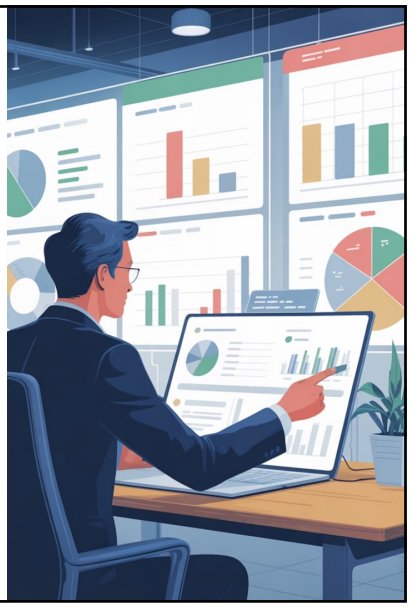

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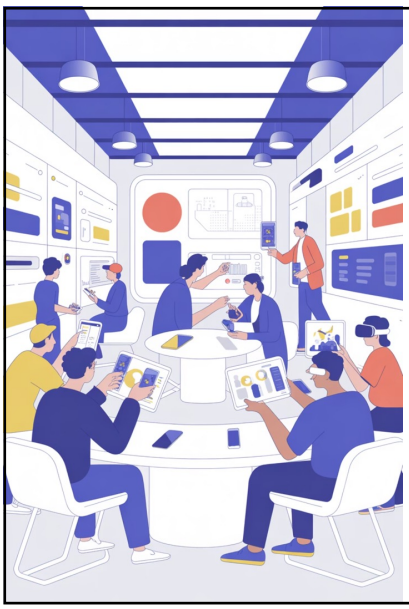

From Design to Decision

Session Objectives

1 Understand Psychological Foundations

Understand psychological foundations to better support users.

2 Master Validated Measurement Tools

Master validated measurement tools to assess IS quality effectively.

3 Request User Evaluations

Know when and how to request user evaluations, identifying key moments and appropriate methodologies.

4 Interpret Results for Improvement

Interpret results to improve user experience and adoption, deriving concrete insights from UX data.

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Key Psychological Theories for IS Managers

Understanding these theories as an IS manager allows you to:

- Understand and measure psychological needs and individual differences among users to inform IS design
- Identify key metrics that reflect user needs
- Anticipate adoption challenges and user concerns
- Support design decisions with scientific evidence about human behavior

Self-Determination Theory (SDT)

Crucial for fostering intrinsic motivation in teams and user engagement by addressing needs for autonomy, competence, and relatedness. This drives adoption and performance.

Cognitive Load Theory

Essential for optimizing interface and training design. Reducing cognitive load improves comprehension, minimizes errors, and accelerates learning for users and staff.

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Self-Determination Theory (SDT)

Self-Determination Theory (SDT) is a macro-theory of human motivation that identifies three fundamental psychological needs.

Autonomy

The need to feel authorship over one's actions, make choices, and self-regulate.

Competence

The need to feel effective, master new skills, and overcome challenges.

Relatedness

The need to feel connected, accepted, and part of a group or community.

Why This Matters for Managers:

A system that satisfies these needs = better user wellbeing, higher adoption, and more effective work

Reference: Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227-268.

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SDT in Information Systems: Practical Applications

Competence

Feeling effective and capable.

- Clear, actionable feedback in dashboards or ERP systems
- Progress tracking and goal setting features
- Personalized learning paths for software adoption

Design Implication: Provide intuitive interfaces and feedback loops.

Autonomy

Exercising choice and control.

- Customizable dashboards and report configurations
- Flexible workflow options in project management tools
- User-driven data exploration in analytics platforms

Design Implication: Offer meaningful choices and user configuration.

Relatedness

Fostering connections with others.

- Integrated chat/comment features in collaborative documents
- Team spaces and profiles in project management software
- Shared knowledge bases and forums

Design Implication: Integrate social and collaborative functionalities.

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SDT-Based Design Frameworks

1

METUX Model (Peters et al., 2018)

- Comprehensive framework for wellbeing-supportive design
- Includes assessment tools and design patterns
- Focus: Digital experience and user thriving

2

Positive Computing (Calvo & Peters, 2014)

- Broader approach to technology that supports wellbeing
- Integrates SDT with positive psychology
- Focus: Human flourishing through technology

3

Gamification Design (Deterding, 2015)

- Applies SDT to game-like elements in non-game contexts
- Warns against extrinsic rewards undermining intrinsic motivation
- Focus: Meaningful engagement vs. manipulation

Key Insight for IS Managers:

These frameworks share **a common foundation in SDT but offer different lenses**:

- METUX: Practical design checklist
- Positive Computing: Strategic vision
- Gamification: Engagement mechanics

Choose the framework that best fits your project context and organizational goals.

References:

- Calvo, R. A., & Peters, D. (2014). Positive Computing: Technology for Wellbeing and Human Potential. MIT Press.
- Deterding, S. (2015). The lens of intrinsic skill atoms: A method for gameful design. Human-Computer Interaction, 30(3-4), 294-335.

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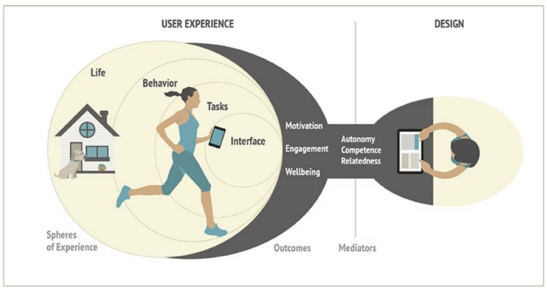
METUX: Motivation, Engagement and Thriving in User Experience

Core Principle:

Technology should support users' psychological needs (autonomy, competence, relatedness) rather than undermine them.



The model considers psychological needs across different spheres of experience:

Adoption, Interface, Tasks, Behavior, Life, and Society.

For IS Managers:

Use METUX as a checklist when evaluating system designs or briefing development teams. It translates SDT theory into actionable design criteria.

Reference: Peters, D., Calvo, R. A., & Ryan, R. M. (2018). Designing for motivation, engagement and wellbeing in digital experience. Frontiers in Psychology, 9, 797.

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METUX Design Questions by Experience Sphere

Practical questions to evaluate psychological need satisfaction across different levels

Interface Sphere

Questions to ask when evaluating the **user interface**:

Autonomy:

- Does the interface provide meaningful choices and customization?
- Are notifications respectful of user control?

Competence:

- Does the interface provide clear, actionable feedback?
- Is the learning curve appropriately scaffolded?

Relatedness:

- Do social features feel optional rather than coercive?
- Does the interface respect privacy while enabling connection?

Task Sphere

Questions about **technology-enabled tasks**:

Autonomy:

- Can users choose how and when to complete tasks?
- Are task workflows flexible or rigid?

Competence:

- Do tasks provide progress indicators and feedback?
- Are tasks appropriately challenging for the user's skill level?

Relatedness:

- Do tasks facilitate meaningful collaboration?
- Can users share accomplishments authentically?

Behavior Sphere

Questions about the **overall supported behavior**:

Autonomy:

- Does the technology increase user agency in their daily activities?
- Does it support user values and goals?

Competence:

- Does the technology help users feel more effective?
- Does it build confidence over time?

Relatedness:

- Does the technology strengthen genuine social connections?
- Does it support community and belonging?

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Cognitive Load Theory

Developed by Sweller (1988), Cognitive Load Theory (CLT) explains how working memory has limited capacity for processing information.

Its core principle is that effective learning and performance occur when cognitive load is optimized, minimizing unnecessary mental effort and maximizing effort dedicated to understanding.

Intrinsic Load

The inherent difficulty of the material or task itself, determined by the complexity and the learner's prior knowledge.

Germane Load

Cognitive effort dedicated to processing, constructing, and automating schemas - the productive mental work that leads to learning and skill development.

Extraneous Load

Cognitive effort imposed by the way information is presented, not related to the actual learning task. Poor design increases extraneous load.

Reference: Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. Cognitive Science, 12(2), 257-285.

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Cognitive Load in Information Systems: Practical Applications

Intrinsic Load

Inherent task complexity

- Complex ERP workflows with multiple interdependent steps
- Data analysis requiring domain expertise
- Multi-system integration tasks

Design implication: Provide training, progressive disclosure, contextual help

Germane Load

Productive learning effort

- Well-designed onboarding that builds mental models
- Interactive tutorials that reinforce understanding

Design implication: Support schema building through good information architecture

Extraneous Load

Poor presentation/design

- Inconsistent navigation across modules
- Cluttered dashboards with irrelevant information
- Unclear error messages or confusing terminology

Design implication: Simplify interfaces, maintain consistency, remove unnecessary elements

Why This Matters for Managers:

High cognitive load = reduced productivity, more errors, longer training time, and user frustration. Optimizing load improves system effectiveness.

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Key Concepts to Measure in IS

Engagement

Definition: User attention and involvement with systems.

- Measured by: User Engagement Scale (UES)
- Key for: Adoption measurement

Flow

Definition: Optimal psychological state of deep focus.

- Measured by: Flow State Scale (FSS), Dispositional Flow Scale (DFS)
- Key for: Understanding peak user experiences

Motivation

Definition: Forces that drive user behavior and persistence.

- Measured for instance by the Intrinsic Motivation Inventory (IMI) questionnaire, linked to SDT
- Key for: Understanding why users adopt or resist systems

These are three distinct but related concepts that can be measured with validated instruments.

References:

- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59-109.
- Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience*. Harper & Row.

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Flow State in Interactive Systems

Flow is a psychological concept describing an optimal state of consciousness where people are fully immersed in an activity. It is a state of complete immersion where users lose track of time and self-consciousness. It arises from an **optimal balance between high challenge and high skill**, fostering intrinsic motivation and peak performance.

Managerial Implications:

- Flow state = peak productivity
- Measurable through dedicated scales
- Design goal for enterprise systems

Reference: Csikszentmihalyi, M. (1990). Flow: The Psychology of Optimal Experience. Harper & Row.

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Conditions for Flow

Clear Goals

Users understand objectives and success metrics.
Example: Dashboard KPIs, task completion indicators.

Immediate Feedback

Actions yield visible, guiding responses.

Example: Real-time validation, progress bars, status updates.

Balanced Challenge & Skill

Tasks are neither too easy nor too difficult.

Example: Role-based interfaces, progressive disclosure.

Focused Attention

Minimized distractions support concentration.

Example: Focused work modes, notification management.

Evaluate these conditions when assessing enterprise system effectiveness.

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Acceptability vs. Usability: An Approach for IT Managers

A critical distinction for IS managers: a system can be usable yet unacceptable to users, and vice-versa.

Usability

A key factor of acceptability, measuring how easily users can learn and use a system, and their satisfaction with it. Focuses on the user experience and interaction design.

- Quick and intuitive learning curve
- Task efficiency and productivity
- Ease of recall for operations
- Error prevention and recovery
- Subjective user satisfaction

Concrete Example: A solution might have low usability due to a complex interface and unoptimized processes, causing high user frustration.

Acceptability

The overarching concept determining whether end-users and stakeholders are willing to adopt an IT solution. Essential for successful deployment, it extends beyond mere functionality.

- Social acceptability (perception, image)
- Practical integration into workflows
- Perceived utility (value + usability)
- Cultural and organizational fit

Concrete Example: A technically performant and usable new tool may be unacceptable if it duplicates existing functions without clear added value, leading to team rejection.

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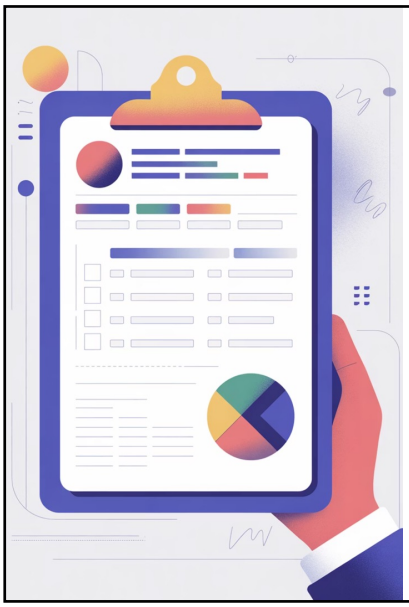

Validated Measurement Tools for IS Evaluation

As an IS manager, use these scientifically validated instruments to objectively assess your systems. These tools provide credible data for decision-making and investment justification.

Why validated instruments?

- Credibility with stakeholders
- Comparable benchmarks
- Defensible metrics for ROI calculations

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NASA Task Load Index (NASA-TLX)

Measures perceived workload across six dimensions: mental, physical, temporal demands, performance, effort, frustration.

Originally for aviation, now widely used to evaluate cognitive load in interactive systems.

When to Use (IS Manager Perspective):

- Evaluating complex enterprise systems (ERP, BI tools)
- Comparing alternative solutions before purchase
- Assessing impact of system upgrades
- Identifying training needs

Business Value:

- High cognitive load = reduced productivity
- Quantifiable metric for system complexity
- Justifies UX investment or system replacement

Reference: Hart, S. G., & Staveland, L. E. (1988). Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research. In P. A. Hancock & N. Meshkati (Eds.), *Human Mental Workload* (pp. 139-183). North-Holland.

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NASA-TLX: Questions

Mental Demand
"How mentally demanding was the task?"
(Very Low → Very High)

Physical Demand
"How physically demanding was the task?"
(Very Low → Very High)

Temporal Demand
"How hurried or rushed was the pace of the task?"
(Very Low → Very High)

Performance
"How successful were you in accomplishing what you were asked to do?"
(Perfect → Failure)

Effort
"How hard did you have to work to accomplish your level of performance?"
(Very Low → Very High)

Frustration
"How insecure, discouraged, irritated, stressed, and annoyed were you?"
(Very Low → Very High)

Note: Each dimension is rated on a 21-point scale from 0 to 100.

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User Engagement Scale (UES)

Focused Attention
User concentration and absorption during activity.

Perceived Usability
User's emotional response and cognitive involvement.

Aesthetic Appeal
Visual attractiveness and design quality.

Reward Factor
Perceived value and intrinsic reward of engagement.

Note: The UES has been refined multiple times. The short form (UES-SF) was developed by O'Brien, Cairns, & Hall (2018).

Reference

O'Brien, H. L., & Toms, E. G. (2010). The development and evaluation of a survey to measure user engagement. *Journal of the American Society for Information Science and Technology, 61*(1), 50-69.

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UES short: Questions

Examples of questions for each dimension of the User Engagement Scale:

Focused Attention

- "I lost myself in this experience"
- "The time I spent using the system just slipped away"
- "I was absorbed in my task"

Perceived Usability

- "I felt frustrated while using this system"
- "I found this system confusing to use"
- "Using this system was taxing"

Aesthetic Appeal

- "This system was attractive"
- "This system appealed to my senses"
- "This system was aesthetically appealing"

Reward

- "Using this system was worthwhile"
- "My experience was rewarding"
- "I felt interested in this experience"

Response scale: 5-point Likert (Strongly Disagree → Strongly Agree)

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System Usability Scale (SUS)

The System Usability Scale (SUS) is a 10-item questionnaire providing a quick, reliable usability score (0-100). Despite its simplicity, it effectively correlates with comprehensive usability metrics.

Why SUS for IS Managers:

- Quick assessment (5 minutes per user)
- Industry-standard benchmark
- Cost-effective evaluation method
- Comparable across systems and competitors

Practical Applications:

- Post-deployment validation
- Continuous improvement tracking
- Budget justification for redesign

References:

Brooke., J. (1996). SUS: A "quick and dirty" usability scale. In P.W. Jordan, B. Thomas, B.A. Weerdmeester & I. McClelland (Eds.), *Usability evaluation in industry* (pp. 189–194). London: Taylor & Francis.

Brooke, J. (2013). SUS: A Retrospective. *Journal of Usability Studies*, 8(2), 29–40.

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SUS: Questions

The 10 standard SUS questions (alternating positive and negative):

01
"I think that I would like to use this system frequently"

02
"I found the system unnecessarily complex"

03
"I thought the system was easy to use"

04
"I think that I would need the support of a technical person to be able to use this system"

05
"I found the various functions in this system were well integrated"

06
"I thought there was too much inconsistency in this system"

07
"I would imagine that most people would learn to use this system very quickly"

08
"I found the system very cumbersome to use"

09
"I felt very confident using the system"

10
"I needed to learn a lot of things before I could get going with this system"

Response scale: 5-point Likert (Strongly Disagree → Strongly Agree). Note: Items 2, 4, 6, 8, 10 are reverse-coded.

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Interpreting SUS Scores

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Intrinsic Motivation Inventory (IMI)

The IMI assesses subjective experiences and intrinsic motivation within experimental tasks. It covers seven key dimensions: interest/enjoyment, perceived competence, effort, value/usefulness, felt pressure and tension, perceived choice, and relatedness (recently added).

IS Manager Applications:

- Measure user motivation for new system adoption
- Assess gamification effectiveness in enterprise tools
- Evaluate training program engagement
- Predict long-term system usage patterns

Why It Matters:

- Intrinsically motivated users = sustainable adoption
- Identifies systems requiring external incentives
- Informs change management strategies

References:

- Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory.
- *Journal of Personality and Social Psychology, 43*(3), 450-461.
- The IMI is available from the Center for Self-Determination Theory: https://selfdeterminationtheory.org/intrinsic-motivation-inventory/

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IMI Subscales and Applications

Choose subscales relevant to your research question; all dimensions are not required.

Interest/Enjoyment
Intrinsic motivation's core indicator.

Perceived Competence
Aligns with SDT's competence need.

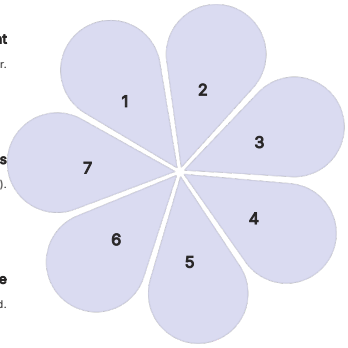
Effort
Measures investment in the activity.

Relatedness
Measures social connection (recently added subscale).

Value/Usefulness
Used in internalization studies.

Perceived Choice
Aligns with SDT's autonomy need.

Pressure/Tension
Negative predictor of intrinsic motivation.



IMI Versions:

- **Full version:** 45 items across 7 subscales
- **Standard version:** 22 items with 4 subscales (interest/enjoyment, perceived competence, perceived choice, pressure/tension)
- **Short version:** 9 items with 3 subscales (interest/enjoyment, perceived competence, pressure/tension)
- **Internalization version:** 25 items with 3 subscales (value/usefulness, interest/enjoyment, perceived choice)
- **Interpersonal relatedness version:** 29 items with 5 subscales (relatedness, interest/enjoyment, perceived choice, pressure/tension, effort)

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IMI: Sample Questions

Examples of questions for each IMI subscale:

Interest/Enjoyment
- "This activity was fun to do"
- "I enjoyed doing this activity very much"

Perceived Competence
- "I think I am pretty good at this activity"
- "I am satisfied with my performance at this task"

Effort
- "I put a lot of effort into this"
- "I tried very hard on this activity"

Value/Usefulness
- "I believe this activity could be of some value to me"
- "I think that doing this activity is useful"

Pressure/Tension
- "I felt very tense while doing this activity"
- "I felt pressured while doing this"

Perceived Choice
- "I felt like it was my choice to do this activity"
- "I did this activity because I wanted to"

Relatedness
- "I felt really connected to others during this activity"
- "I felt close to the people I interacted with"

Response scale: 7-point Likert (Not at all true → Very true)

(R) = Reverse-coded item (Note: No reverse-coded items are shown in these examples)

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Basic Psychological Need Satisfaction (BPNS)

The BPNS questionnaire assesses the satisfaction of the three basic psychological needs (autonomy, competence, and relatedness) in general life contexts. It is designed to measure the subjective experience of these needs across various life domains and can be adapted to specific contexts such as work or personal relationships.

Applications for IT Managers:

- Assessment of general team well-being.
- Understanding employee satisfaction in organizational contexts.
- Establishing a baseline for interventions aimed at improving psychological needs.

Autonomy
- "My choices truly reflect what I want to do."
- "I have the freedom to make my own decisions."

Competence
- "I feel capable of doing the things I undertake."
- "I feel effective in what I do."

Relatedness
- "I feel connected to the people around me."
- "I feel that my relationships are important."

Response scale: 7-point Likert scale (Not at all true → Very true).

Reference: Gagné, M. (2003). The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and Emotion, 27*(3), 199-223.

Also see: Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.

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TENS Questionnaire (Technology-Enabled Need Satisfaction)

The TENS (Technology-Enabled Need Satisfaction) questionnaire measures the extent to which technology satisfies and/or frustrates the three basic psychological needs of autonomy, competence, and social relatedness. Based on Self-Determination Theory (SDT), it is specifically designed to analyze the impact of technological systems on user experience.

TENS is unique because it assesses both need satisfaction and need frustration.

Autonomy

- **Satisfaction:** "I feel I have choices in how to use this system."
- **Frustration:** "This system makes me feel like I have no control."

Competence

- **Satisfaction:** "I feel effective and competent using this technology."
- **Frustration:** "I feel like this technology often makes me fail."

Social Relatedness

- **Satisfaction:** "This technology allows me to feel connected to others."
- **Frustration:** "I feel isolated from others because of this technology."

Uses for IT Managers:

- Evaluation of existing or developing technologies.
- Design of systems that promote user well-being.
- Understanding the psychological impact of digital tools on teams.

Reference: Peters, D., Calvo, R. A., & Ryan, R. M. (2018). Designing for motivation, engagement and wellbeing in digital experience. *Frontiers in Psychology, 9*, 797.

Note: TENS is part of the METUX (Motivation, Engagement and Thriving in User Experience) framework and measures need satisfaction/frustration across different spheres of technology experience.

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Overview of Measurement Tools

This synthesis presents the main instruments for evaluating user experience and psychological states related to interaction with systems. Choosing the right tool is crucial for obtaining relevant data and informing strategic decisions.

Cognitive Load (NASA-TLX)

- Purpose: To assess the perceived mental workload during a task.
- When to use: For complex systems where information or manipulation overload is a concern.

User Engagement (UES)

- Purpose: To measure the level of user engagement with a system.
- When to use: For continuous-use systems or applications where immersion and motivation are key.

Usability (SUS)

- Purpose: To quickly assess the perceived usability of a system.
- When to use: For rapid evaluations, system comparisons, or benchmarking.

Intrinsic Motivation (IMI)

- Purpose: To measure components of intrinsic and extrinsic motivation.
- When to use: To evaluate learner motivation, the appeal of games or educational applications.

Psychological Needs (SDT)

BPNS (general)

- Purpose: To assess the satisfaction of psychological needs in general life contexts.
- When to use: To understand general well-being, job satisfaction, or relationships.

TENS (technology)

- Purpose: To measure the impact of technology on the satisfaction of psychological needs.
- When to use: To design systems that promote user well-being and prevent frustration.

A clear understanding of these instruments will allow you to choose the most suitable tool for your evaluation objectives and maximize the impact of your research.

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Questionnaire Design Principles

When creating custom, ad-hoc questionnaires, ensure they follow these principles. Effective design balances scientific rigor with positive participant experience. Poor design risks measurement errors, respondent fatigue, and biased responses, compromising data quality and leading to bad decisions.

Manager's Checklist:

- Are questions aligned with business objectives?
- Will results inform specific decisions?
- Is the survey length appropriate for your users?
- Can results be compared to industry benchmarks?

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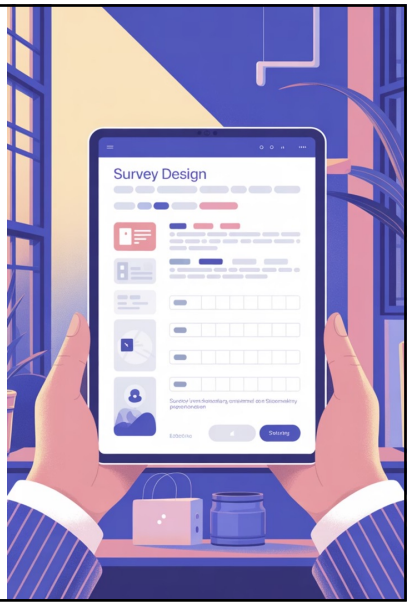

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Crafting Effective Questions

Clarity
Use simple, unambiguous language. Avoid jargon, double negatives, and complex structures.

Specificity
Focus on concrete behaviors or experiences, not general attitudes.

Neutrality
Avoid leading questions that bias responses or suggest a "correct" answer.

Focus
Address one concept per question. Eliminate double-barreled questions.

Common Question Pitfalls

Avoid these common mistakes to improve your questionnaire's effectiveness and gather accurate data.

❌ Poorly Written

- Do you agree that the new policy is confusing and poorly implemented?
- How satisfied are you with our products and services?
- Do you ever use social media?
- What is your opinion on the recent economic policies?

✅ Well Written

- Is the new policy clear? (Yes/No/Unsure)
- How satisfied are you with our products? And how satisfied are you with our services?
- How often do you use social media? (Daily/Weekly/Monthly/Rarely/Never)
- To what extent do you agree or disagree with the following statement: "The recent economic policies have positively impacted my finances."

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Likert Scale Design Decisions

5-Point vs. 7-Point

5-point scales offer simplicity; 7-point scales provide greater nuance. Select based on desired granularity versus ease of response.

Neutral Midpoint?

A neutral option accommodates ambivalence but risks 'fence-sitting.' Forced-choice scales prompt a directional response.

Scale Reliability and Validity

Reliability

Measures consistency: Does the scale yield stable results over time and across related items?

Assessed using **Cronbach's alpha** ($\alpha \geq 0.70$).

Validity

Measures accuracy: Does the scale truly measure its intended construct?

Key types: **Content, Criterion, Construct**.

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Critically Reading Published Instruments

Original Context

Was the instrument validated in a similar domain and population?

Psychometric Properties

Review reported reliability and validity evidence.

Cultural Fit

Will items translate well to your context and language?

Length vs. Burden

Is the full scale or a short form more appropriate?

Adapting Existing Instruments

- Adapt validated scales for your specific context.
- Minor changes (e.g., "website" to "app") are permissible, but major modifications require re-validation.
- Document all changes in your methodology.

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Adaptation Guidelines

Document Changes

Record all modifications and rationale, comparing original and adapted items.

Expert Review

Engage domain experts to assess content validity and construct preservation.

Pilot Testing

Conduct small-scale tests to identify issues and check reliability.

Re-validate

For significant changes, perform new reliability and validity analyses.

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Questionnaire Structure and Flow

1. **Introduction**

   Purpose, informed consent, estimated time, confidentiality.

2. **Warm-Up Questions**

   Easy, non-threatening questions to build rapport.

3. **Core Measures**

   Main validated scales during peak respondent focus.

4. **Demographics**

   Sensitive items placed at the end, once rapport is established.

5. **Thank You**

   Appreciation, next steps, and contact for inquiries.

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Minimizing Survey Fatigue

Keep It Concise

Target 5-10 minute completion. Longer surveys increase abandonment rates.

Show Progress

Visual indicators help respondents manage time and reduce uncertainty.

Vary Question Types

Vary question formats to sustain attention, prioritizing clarity over novelty.

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Response Biases to Consider

Acquiescence Bias

Tendency to agree with statements.

Mitigation: Combine positive and reverse-coded items.

Social Desirability

Respondents answer to appear favorable.

Mitigation: Ensure anonymity, use neutral wording.

Extreme Responding

Tendency to always choose extreme options (strongly agree/disagree) regardless of actual opinion.

Mitigation: Use clear scale labels, use descriptive labels for each point (e.g., 'Never', 'Rarely', 'Sometimes', 'Often', 'Always').

Central Tendency

Tendency to select middle or neutral options.

Mitigation: Employ forced-choice or remove midpoints.

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Ethical Considerations in Measurement

Informed Consent

Ensure participants understand the research purpose and their right to withdraw.

Privacy & Anonymity

Safeguard participant identities and sensitive data through secure handling.

Minimize Harm

Avoid questions causing distress; consider potential psychological impact.

Transparency

Be clear about research objectives and data usage/sharing.

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Common Evaluation Mistakes for IS Managers

- **Measuring Without Clear Objectives**
  Collecting data without knowing what decision it will inform.
- **Choosing Tools Based on Convenience**
  Using available tools rather than appropriate ones.
- **Ignoring Sample Representativeness**
  Surveying only power users or early adopters.
- **Confusing Metrics**
  Mixing usability scores with satisfaction ratings.
- **Acting on Insufficient Data**
  Making major decisions based on small samples.
- **Ignoring Context**
  Comparing scores across different user populations or systems.

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IS Manager's Evaluation Best Practices

1

Align with User Needs

Link measurements to user requirements and organizational objectives that serve people.

2

Use Validated Instruments

Ensure credibility and comparability.

3

Plan Before Deploying

Baseline measurements before system changes.

4

Budget for Evaluation

Include UX assessment in project costs.

5

Involve Stakeholders Early

Get buy-in for evaluation approach.

6

Communicate Results Clearly

Translate metrics to business impact.

7

Act on Findings

Use data to drive decisions, not justify them.

8

Track Over Time

Establish continuous improvement metrics.

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When to Create Custom Scales

While existing validated scales are generally preferred, custom scale creation is justified when:

- No existing instrument captures your specific construct.
- Available scales don't fit your domain or population.
- Existing instruments do not account for your specific organizational context or unique system features.
- You need to combine aspects from multiple validated instruments to create a comprehensive measure.

Warning: Scale development demands significant expertise, time, and multiple validation studies.

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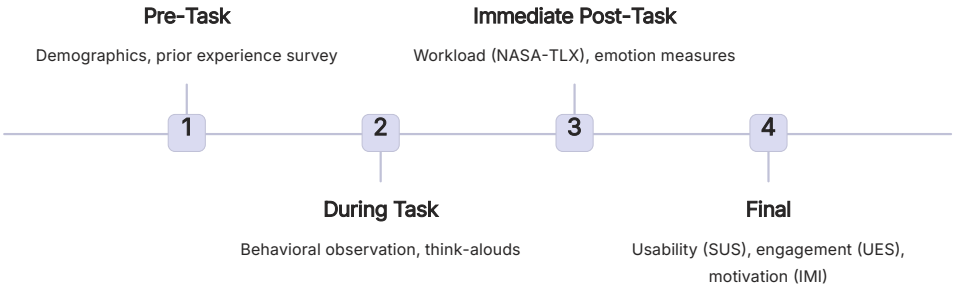
Sample Multi-Method Assessment



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Analyzing Questionnaire Data

Descriptive Statistics

Calculate means, standard deviations, and distributions. Identify ceiling/floor effects and outliers.

Reliability Analysis

Compute Cronbach's alpha (acceptable > 0.70) for multi-item scales to ensure internal consistency.

Comparative Analysis

Utilize t-tests or ANOVA for group comparisons. Employ non-parametric alternatives if assumptions are violated.

Correlation Analysis

Examine inter-construct relationships. High correlations indicate overlapping concepts or multicollinearity.

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From Theory to User Impact

Understanding psychological foundations enables you to:

Make Informed Decisions

- Choose appropriate metrics for each evaluation
- Interpret results in context
- Identify root causes of usability issues

Communicate Effectively

- Explain findings to technical and general stakeholders
- Advocate for user-centric design with evidence
- Set realistic expectations for improvements

Foster User Well-being

- Connect UX improvements to enhanced user satisfaction
- Prioritize features that enhance user effectiveness and well-being
- Foster a culture focused on humane system design

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Workshop: Managerial Decision-Making and Evaluation

Context

A company has deployed a new internal Business Intelligence (BI) dashboard for managers.

The system is technically functional and provides accurate data, but its use varies significantly across departments.

Senior management must now decide what to do next.

Workshop Goal

The goal of this workshop is to understand how:

- evaluation methods depend on managerial decisions,
- and how the same system can lead to different conclusions, depending on what decision needs to be made.

Key idea: Measuring is not neutral — it supports a decision.

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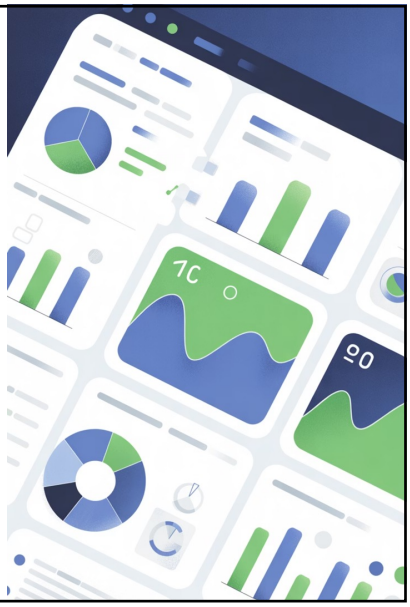

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Your Role

You are a member of the executive committee and represent a specific managerial role.

You have access to all evaluation results, but you must interpret and prioritize them according to your managerial responsibilities and interests.

You are expected to defend a position, not to provide a neutral analysis.

Group Assignments

Group A – Chief Financial Officer (CFO)

Focus: investment, costs, return on investment, strategic alignment

Group B – Human Resources Director (HR)

Focus: adoption, motivation, autonomy, long-term engagement

Group C – Chief Operations Officer (COO)

Focus: operational performance, workload, efficiency, reliability

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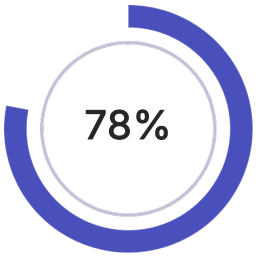
Evaluation Results (Fictitious Data)

1️⃣ Usability – SUS

Users report feeling confident and comfortable using the system.



SUS Score: 78

Interpretation: Excellent usability

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Evaluation Results (Fictitious Data)

2️⃣ Motivation & Psychological Needs – IMI / TENS

Metrics:

- Interest / Enjoyment: Low
- Perceived Choice (Autonomy): Very Low
- Pressure / Tension: High
- Autonomy Frustration: High

User comments:

> "I use it because I have to."

> "It feels imposed."

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Evaluation Results (Fictitious Data)

3️⃣ Cognitive Load – NASA-TLX

NASA-TLX Scores:

- Mental Demand: High
- Temporal Demand: High
- Effort: Very High
- Frustration: High
- Self-rated Performance: Moderate

Observed behaviors:

- Frequent exports to Excel
- Interpretation errors

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Your Task (15 minutes)

01

Identify

Identify the evaluation results that matter most for your role.

02

Explain

Explain why these results should be prioritized over others.

03

Recommend

Make one clear recommendation to senior management.

04

Identify Risk

Identify one major risk if your recommendation is not followed.

You should be able to answer: "Given my role, what is the most important decision to make now — and why?"

Key Reminders:

- The system is the same.
- What differs is what each manager considers critical.
- Evaluation supports decisions — it does not replace them.

Presentation Rules:

- 2–3 minutes per group
- One spokesperson
- Focus on decisions and arguments, not on questionnaire details

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