CIKI | ICKM | GFIC

SANTIAGO 2026

OFFICIAL PROGRAM

International Conference

The Next Horizon

Integrating AI, Knowledge, Innovation and Talent for Sustainable Global Development

October 28, 29 and 30, 2026

www.knowledgeconference.cl

Organized by:

ciKi

ICKM — Conference on Knowledge Management International

GFIC Global Forum of Intellectual Capital by ICAA

Host institution:

USACH

OCTOBER 28 – 30, 2026

Program at a glance

Day 1 Wednesday, October 28

08:00 – 08:45	**Registration**	
08:45 – 09:30	**Opening ceremony**	
09:30 – 10:20	**Keynote**	Florinda Matos
10:30 – 11:30	**Panel: Innovation and Knowledge Management**	Plenary · Parallel sessions in Rooms 1–4
11:30 – 12:00	**Coffee break**	
12:00 – 13:00	**Workshop: Innovation Ecosystems in Latin America**	Plenary · Parallel sessions in Rooms 1–4
13:00 – 14:30	**Lunch**	Not provided by the organization
14:30 – 15:30	**Round table**	Tereza Merlo
16:00 – 18:30	**Panel: Knowledge Management and Innovation**	Plenary · Workshop in Room 4
18:30 – 19:30	**Welcome cocktail**	

Day 2 Thursday, October 29

09:00 – 09:50	**Keynote**	Pedro Salsedo
10:00 – 11:20	**Parallel sessions**	Plenary and Rooms 1–4
11:20 – 11:50	**Coffee break**	
11:50 – 13:00	**Parallel sessions**	Plenary and Rooms 1–4
13:00 – 14:00	**Lunch**	Not provided by the organization
14:00 – 15:00	**Round table**	Fernando Daniels, Normand Roy, Ricardo Pérez Mora, Anne-Marie Sénécal
15:00 – 15:30	**Coffee break**	
15:30 – 17:00	**Panel: Artificial Intelligence**	Plenary · Workshop in Room 4
17:00 – 18:00	**Keynote**	Sebastian Beland
20:30	**Conference dinner**	

Day 3 Friday, October 30

09:30 – 10:20	**Keynote**	Marcela Rossinelli
10:20 – 11:50	**Panel: Knowledge and Sustainability (until 11:20) / Parallel sessions (until 11:50)**	Plenary · Wikipedia workshop in Room 4 · Parallel sessions in Rooms 1–3
11:50 – 12:20	**Coffee break**	
12:20 – 13:20	**CIKI round table**	Roberto Pacheco, Nuno Matos, Tamer Uzun¸ Angela Regina Heinzen Amin Helou
13:20 – 13:50	**Closing remarks and acknowledgments**	

Parallel sessions are presented in Portuguese, English and Spanish. The following pages detail each block, room by room, with its papers and authors.

Day 1 · Wednesday, October 28

08:00 – 08:45

Registration

08:45 – 09:30

Opening ceremony

09:30 – 10:20 PLENARY · KEYNOTE

Intellectual capital management: Driving AI and Sustainable Transformation

Florinda Matos, Iscte -Instituto Universitario de Lisboa / Presidenta de la Asociación de Capital Intelectual

10:30 – 11:30 PLENARY · SPEAKER PANEL

Innovation and Knowledge Management

Introduced by: Evelyn Bunster

1 **“Skill-Based Organizations as a Key Driver of Talent and the Future of Work”**
Alejandro Gamboa

2 **“Case Law Knowledge Management in the Age of Artificial Intelligence”**
Roberto Campos

10:30 – 11:30 · Parallel sessions-in-person articles

Room 1 PORTUGUESE Session chair: Catherine Menegaldi Silva

1 **From Discourse to Practice: The Operational Limits of Knowledge Management in Organizational Contexts**
Beatriz Santos, Ieda Damian and Luciana Morilas

2 **Smart Cities for Ageing Societies: An Inclusive Framework Integrating IoT, AI, and Urban Governance**
Anderson Saccol Ferreira, Rejane Bolzan, Gilson Ditzel Santos and Maria De Lourdes Bernartt

3 **Conceptual Framework for the Development of Accessible Digital Products for Older Adults: An Integrative Literature Review**
Willi Braz Vermohlen, Maria José Baldessar and Cristiane Fontinha Miranda

Room 4 ENGLISH Session chair: Tereza Raquel Merlo

1 **Knowledge Stewardship, Cultural Preservation, and Collective Memory in the Age of Artificial Intelligence: Navigating the Tensions between Libraries and Large Language Models**
Tereza Raquel Merlo

2 **Green Data Centers: Applying Knowledge Management to Enhance Energy Efficiency and Reduce Carbon Footprint**
Tereza Merlo and Yara Mohammed

3 **Smart Anticipatory Knowledge Retention: Predictive Questioning for AI-Based Knowledge Capture across Offboarding and Onboarding**
Tamer Uzun, Michael Müller, Vicente Guerola-Navarro and Cecília Kotzias

4 **Agent Habitats: An Orchestration and Governance Architecture for Coexisting AI Agents in the Enterprise**
Tamer Uzun, Najdet Kassim, Vicente Guerola-Navarro and Michael Müller

Room 2 PORTUGUESE Session chair: Rogério Bastos

1 **Knowledge Bottlenecks in Innovation Habitats: A Comparative Study of Science and Technology Parks**
Milena Maredmi Corrêa Teixeira, Guilherme Salm Duarte, Eduardo Cesar Cordeiro Vieira and Clarissa Stefani Teixeira

2 **Governance Models for Innovation Ecosystems: An Integrative Review**
Bruna Fernanda da Silva, Guilherme Salm Duarte, Guilherme Paraol de Matos and Clarissa Stefani Teixeira

3 **Beyond Organisational Boundaries: Relational Capital as a Driver of Innovative Performance in Innovation Ecosystems**
Graciele Tonial, Paulo Maurício Selig, Carlos Ricardo Rossetto, Guillermo Antonio Dávila and Patricia Ines Schwab

Room 3 PORTUGUESE Session chair: Gregório Varvakis

1 **Best Practices for Disseminating Intellectual Property Knowledge: An Analysis for Regional Innovation Systems in the State of Paraná, Southern Brazil**
Isabela de Souza Cruz, Rejane Sartori and Arthur Gualberto Urpia

2 **Technological Innovation Centers in Brazil: An Analysis of the Evolution of Their Activities**
Hilka Pelizza Vier Machado, Rejane Sartori and Danieli Pinto

3 **The Integration of Cell Broadcast into the Interface de Divulgação de Alertas Públicos (IDAP) as a Strategy for Expanding Knowledge Transfer in Public Alert Systems**
Nathiele Rodrigues Leopoldo and Vanessa Marie Salm

11:30 – 12:00 **Coffee break**

12:00 – 13:00 PLENARY · WORKSHOP

Innovation Ecosystems in Latin America: Connections, Capabilities and Experiences.

Eduardo Giugliani-TECNOPUC (moderator), Dr. Leonel Rojo-INNOVO USACH, Macarena Villalobos Start-up-Chile

12:00 – 13:00 · Parallel sessions

Room 1 PORTUGUESE Session chair: Gregório Varvakis

1 **Living Labs as “Ba”: Knowledge Creation and Public Innovation in the Brazilian Judiciary**
Karine Costa Colle, Igor Yure Ramos Matos, Suelen Priscila Buffon Muhl and Luis Felipe Dias Lopes

2 **Innovation Centers in Santa Catarina as “Ba” Environments: Knowledge Creation and Regional Development**
Suelen Priscila Buffon Muhl, Karine Costa Colle, Igor Yure Ramos Matos and Luis Felipe Dias Lopes

3 **Co-Production as a Strategic Capability for Public Innovation in I-Labs**
Guilherme Salm Duarte, Milena Maredmi Corrêa Teixeira, Bruna Fernanda da Silva, Clarissa Stefani Teixeira and Roberto Pacheco

Room 3 PORTUGUESE Session chair : Hans Van Bellen

1 **Data Storytelling as Sociotechnical Mediation in Pandemic Contexts: Between Statistical Abstraction and the Singularization of Loss**
Carlo Manfroi, Júlio Monteiro Teixeira and Armando Luciano Carvalho Agostini

2 **From Academic Research to Social Everyday Life: Developing AI-Based Audiovisual Artifacts for Science Communication**
Rita Paulino and Neri Paulo da Rosa Neto

3 **Artificial Intelligence in Co-Production: A Bibliometric Analysis**
Melise Peruchini, Breno de Souza Ottani, Júlio Monteiro Teixeira and Pedro Antônio de Melo

Room 2 PORTUGUESE Session chair: Rejane Sartori

1 **Innovation Types and Commercial Performance in Family Businesses: A Case Study in the Brazilian Textile Sector**
Fernanda Kleinkauf, Leani Lauermann Koch, Graciele Tonial and Patricia Ines Schwab

2 **Innovation Capability in Brazilian Craft Breweries: Structural Validation and Measurement Invariance across Production Scales**
Anni Kellen Cunico, Sayonara de Fátima Teston, Patrick Zawadzki, Michele Kremer Sott and Sandeep Kumar Gupta

3 **Knowledge Management and Innovation in University Libraries: The Potential of BU/UFSC as a Ba Environment**
Igor Yure Ramos Matos, Suelen Priscila Buffon Muhl, Karine Costa Colle, Luis Felipe Dias Lopes and Roberta Moraes de Bem

Room 4 PORTUGUESE Session chair: Marcelo Macedo

1 **Academic Engagement, Knowledge Management, and Institutional Intelligence**
Marcia Souza, Thuinie Daros, Katia Coelho, Gustavo A. P. Mateus and Catherine M. Silva

2 **Development of Academic Management Competencies in Course Coordinators: A Case Study in a Brazilian Community Higher Education Institution**
Adriano Schlosser, Marcos Baptista Lopez Dalmau, Catiane Pelissari and Carla Fabiana Cazella

3 **Competencies to Foster Innovation: An Analysis of the Soft Skills and Hard Skills of Innovators**
Guilherme Salm Duarte, Bruna Fernanda da Silva, Juliana de Souza Corrêa, Milena Maredmi Corrêa Teixeira and Clarissa Stefani Teixeira

4 **Organizational Coproduction-Based Learning for Sustainable Telecommunications**
Roberto Pacheco, Mônica Carneiro and Cecilia Henriques

13:00 – 14:30 **Lunch** · Not provided by the organization

14:30 – 15:30 PLENARY · ROUND TABLE

Data to Decisions: Agentic AI, Knowledge Management, and the Future of Intelligent Organizations

Tereza Raquel Merlo, Gregorio Varvakis (Moderator), Zach Wahl

16:00 – 18:30 PLENARY · SPEAKER PANEL

Knowledge Management and Innovation¸

Introduced by: Evelyn Bunster

1	**“Experiences with Technologies for Rehabilitation in Magallanes – Club de Leones Cruz del Sur Rehabilitation Corporation”** Eduardo Bahamondes
2	**“Innovation and Knowledge as Engines for the Development of Astronomy”** Maxime Boccas · ESO Paranal Observatory
3	**“From Capabilities to Impact: Applied Innovation and Collaboration to Transform Challenges into Projects at the National Space Center”** Joselyn Robledo · Chilean Air Force
4	**“Innovation in Defense: Beyond Technology and Engineering in the Chilean Army”** Roberto Castillo · Chilean Army

16:00 – 18:30 ROOM 4 · WORKSHOP

The Elements of Knowledge and Innovation: How to Design Unique Capability Combinations for Strategy

Juan Esteban Cuervo

18:30 – 19:30 **Welcome cocktail**

Day 2 · Thursday, October 29

09:00 – 09:50 PLENARY · KEYNOTE

World models in AI : Knowledge Engineering for Innovation and Sustainable Development

Pedro Salcedo, University of Concepción.

10:00 – 11:20 · Parallel sessions-in-person articles

Plenary

PORTUGUESE Session chair: Marcia Souza

1	**O Uso Criativo de Dados em Transmissões Audiovisuais Esportivas: Uma Análise da Mídia Digital na World Surf League (WSL)**	Francieli Pagani Morais and Júlio Monteiro Teixeira
2	**AI-Supported Urban Media Design: A Retrospective Analysis of the Floripa a Pé Case**	Laryssa Tarachucky, Cristina Nunes and Douglas Menegazzi
3	**Automation of Journalistic Production with Artificial Intelligence: Development of an Automated Workflow for News Generation and Publication**	Neri Paulo da Rosa Neto and Rita Paulino
4	**Cata, Virtual Reporter: Applying Artificial Intelligence to Innovate in Science Communication**	Neri Neto and Jacques Mick

Room 2

ENGLISH Session chair: Gregorio Varvakis

1	**Knowledge Transfer in the Age of AI: Matching the Speed of Innovation to the Speed of Adoption**	Amy Rosellini
2	**Creating an Organizational Culture that Promotes Knowledge Commercialization in Lithuanian Tech Startups**	Ingrida Girnienė and Ignas Grigas
3	**Knowledge Management as a Support for Innovation Environments**	Anderson Ricardo Silvestro and Joelias Silva Pinto-Junior
4	**Expression Plane Enhancing Knowledge Production and Acquisition**	Paulo Vitor Tavares and Luciane Maria Fadel

Room 1

PORTUGUESE Session chair: Thaise Moser Teixeira

1	**Mining Hidden Patterns in Critical Travel Times: A Clustering Approach for the CBMSC in Florianópolis**	Mauricio Begnini, Cristyan Francisco da Silva, Henrique Ribeiro, Giovani Gracioli and Vinicius Ramos
2	**Progressive Semantic Qualification of Heterogeneous Institutional Data for Knowledge Graph Construction**	Márcio Clemes, Rogerio Bastos, Lia Bastos and Roberto Tagliari Hoffmann

3	**Semantic Traceability of Municipal KPIs through Knowledge Graphs** Márcio Clemes, Rogerio Bastos, Lia Bastos and Roberto Tagliari Hoffmann
4	**Toward Semantic Governance in Municipal Ecosystems Using Knowledge Graphs** Márcio Clemes, Rogerio Bastos, Lia Bastos and Roberto Tagliari Hoffmann

Room 3 SPANISH Session chair: Jean Pierre Remonsellez Rojas & Marcela Vera

1	**Can AI Synthesize Scientific Serendipity? A Conceptual Framework for Human-AI Discovery Management** Patrick Zawadzki and Julian Alexander Brzozowski
2	**Innovation Environments: A Systematic Review on Design Management in the Configuration of University-Industry Alliances and Their Value Creation Opportunities** Maria Alejandra Sánchez Pérez and Clara Isabel López Gualdron
3	**Co-Creating Intellectual Capital: A University-Microenterprise Knowledge Transfer Model at the Base of the Pyramid** Pablo Farias Gadal
4	**Adapting Tradition: Knowledge Transfer and Innovation in Afro-Colombian Gastronomic Tourism** Neidy Lorena Lopez Earaso, Oscar Martin Rosero Sarasti and Fernando Zeballos
5	**Micro-Governance and the Circular Economy: Analogue Management as a Structural Barrier to ESG Integration at the Base of the Pyramid** Pablo Farias Gadal

Room 4 PORTUGUESE *Session chair* : Katia Coelho

1	**Augmentation or Substitution? Perceptions of Generative AI and the Future of Work in Technology-Based Firms** Aline Luiza Brusco Pletsch, Graciele Tonial, Florinda Matos, Leani Lauermann Koch, Carolina Marques and Guillermo Antonio Dávila
2	**From Fragmented Knowledge to Intelligent Ecosystems: Rethinking Knowledge Management for Innovation in Digital Contexts** Beatriz Santos, Ieda Damian and Luciana Morilas
3	**Artificial Intelligence, Higher Education, and Lifelong Learning: Perceptions of Students at the University of the Third Age** Ana Lúcia Behrend Listone and Suelen Aparecida Padilha Prando
4	**The Entrance of Artificial Intelligence as an Inducer of Management Change and Team Orchestration under the Dynamic Capabilities Lens** Fernanda Rodrigues

11:20 – 11:50 Coffee break

11:50 – 13:00 · Parallel sessions-in-person articles

Plenary PORTUGUESE Session chair: Rogério Bastos

1	**Innovation in the Teaching Evaluation Process: Using Large Language Models as a Psychometric Pre-Validation Tool in Institutional Evaluation Committees** Fabricio Lazilha, Danieli Pinto and José Valderlei da Silva
2	**The SECI-T Construct: Temporalized Knowledge Management as a Mechanism of Institutional Pedagogical Innovation — Optimization Algorithms as Accelerators of the Knowledge-Creation Cycle in the ENADE Context** Aparecido Vilela Junior, José Valderlei da Silva and Nelson Nunes Tenório Junior
3	**Maturity Taxonomy for Faculty Use of Artificial Intelligence in Higher Education** Thuinie Daros, Letícia Fleig Dal Forno, Kátia Solange Coelho, Marcia De Souza and Thaise Moser Teixeira
4	**Artificial intelligence in the research guidance service for database searching at the university library of the universidade do Estado De Santa Catarina** Gustavo Oliveira, Vanessa Salm, Dayane Dornelles and Igor Matos

Room 2 CASES - ALL LANGUAGES Session chair: Pablo Isla & Hans Van Bellen

1	**An AI-Driven Knowledge Analytics System for Scientific Production Management in a Public Research Center** Beatriz Santos, Ieda Damian and Luciana Morilas
2	**ECOVISION, KNOWLEDGE-BASED INNOVATION CASE FOR SUSTAINABILITY GOVERNANCE IN LATIN AMERICAN AUDIOVISUAL SECTOR** Marilha Naccari Santos and Maria J. Baldessar
3	**Preparing Youth for Democratic Participation in the Era of Artificial Intelligence and Digital Transformation: A Case Study from El Salvador** Génesis Benavides

Room 3 PORTUGUESE Session chair : Catherine Menegaldi Silva

1	**Stagnation of the Hackerspace Movement in Brazil? A Comparative Overview (2010–2025)** Steffi Becker, Danieli Pinto, Rejane Sartori and Nelson Nunes Tenório Junior
2	**EcoGrad: An AI-Augmented Network Framework for the Mapping of Academic Knowledge Ecosystems** Gustavo Simas da Silva and Vania Ribas Ulbricht
3	**What Do We Know About Scientific Synthesis Centers? A Scoping Review** Léa Morais and Gertrudes Dandolini

Room 1 PORTUGUESE Session chair : Nuno Matos

1	**Learning Ecosystems: Innovation Governance in Santa Catarina from the Perspective of the Quintuple Helix** Leani Lauermann Koch, Graciele Tonial, Florinda Matos, Patricia Ines Schwab and Aline Luiza Brusco Pletsch

2 **Mapping the Green Hydrogen Technological Innovation System in Portugal: A Functional Analysis of the TIS through the Lens of Knowledge Management and Technology Diffusion**
Caroline Rodrigues Vaz, Mauricio Uriona Maldonado, Paulo Maurício Selig and Paula Fernanda Varandas Ferreira

3 **The Role of Sectoral Governances in the Innovation Ecosystem Estação 43: Articulation, Coordination and Stimulus to Innovation**
Danieli Pinto, Letícia Molina, Rejane Sartori and Hilka Machado

Room 4 PORTUGUESE Session chairs: Marcelo Macedo

1 **Integrating Knowledge Management and Absorptive Capacity: Evidence from an Integrative Literature Review**
Juliane Laviniki, Gregório Varvakis, Lydia Bez Pereira Fontana and Guillermo Antonio Dávila Calle

2 **Knowledge Openness and Hiding in Interdisciplinary Research Organizations**
Léa Morais and Gertrudes Dandolini

3 **A Multi-Dimensional Readiness Framework for Commons Governance in Protected Areas**
Fernanda Guimarães, Fernando Ostuni Gauthier and Roberto Pacheco

13:00 – 14:00 **Lunch** · Not provided by the organization

14:00 – 15:00 PLENARY · ROUND TABLE

OUI: Education and Artificial Intelligence

Fernando Daniels (Moderator), Normand Roy, Ricardo Pérez Mora, Anne-Marie Sénécal

15:00 – 15:30 **Coffee break**

15:30 – 17:00 PLENARY · SPEAKER PANEL

Artificial Intelligence

Introduced by: Evelyn Bunster

1 **“Lessons Learned from AI Implementation for SMEs in South Korea”**
David Ryu

2 **“Generative Artificial Intelligence, Opportunities for the Future of Work: A Study in 5 Latin American Countries”**
Gianni Anelli · CENIA

3 **“Artificial Intelligence Applied to Educational Transformation: Opportunities, Challenges, and Experiences from Higher Education”**
Patricia Moller

15:30 – 17:00 ROOM 4 · WORKSHOP

Building Trusted Intelligence: Agentic AI and Data Governance for Organizational Decision-Making

Dr. Tereza Merlo

17:00 – 18:00 PLENARY · KEYNOTE

AI is changing assessment: Are we ready?

Sebastian Beland¸ University of Montreal

20:30 **Conference dinner**

Day 3 · Friday, October 30

09:30 – 10:20 PLENARY · KEYNOTE

Intelligent Virtual Campus (IVC): An Inclusive, Scalable, and Customizable AI-Driven Model to Democratize STEM-H Competencies and Transform Higher Education

Marcela Rossinelli, Universidad de Santiago de Chile

10:20 – 11:20 PLENARY · SPEAKER PANEL

Knowledge and Sustainability

Introduced by: Evelyn Bunster

1 **“Work of the Future: Transformations and Opportunities”**
Patricia Roa (OIT)

2 **“AI as a Driver of Corporate and Institutional Eco-Efficiency”**
Ivonne Bell

10:20 – 11:20 ROOM 4 · WORKSHOP

Workshop Wikipedia Chile :From Dispersed Knowledge to Connected Knowledge: Wikimedia Tools for Knowledge Management

10:20 – 11:50 · Parallel sessions-in-person articles

Room 1 SPANISH Session chair : Isabel Torres Zapata & Diego Fuentealba

1 **Regulatory Knowledge Management through Generative Artificial Intelligence: Design and Evaluation of a Copiloted Assistant for Accounting and Auditing**
Samuel Salazar and Diego Fuentealba

2 **Human Capital Development in a Doctoral Program at a Mexican Public University: Achievements, Challenges, and Opportunities in Knowledge Management**
Lourdes Nayeli Quevedo Huerta and Efrén Orozco López

3 **Unethical AI Behaviors as Risks to Organizational Knowledge Capital: A Governance Framework from a Bibliometric and Integrative Review**
Patrick Zawadzki, Kurt Schneider, Tiago Zonta and Sayonara de Fátima Teston

4 **Knowledge Management and IA: A Step Forward between Natural Capital Accounting and Financial Accounting**
Isabel Torres Zapata, Humberto Borges and Luis Pinuer

5 **"Bridging Tacit and Explicit Knowledge in SME Diagnostic Framework Development: A Triangulated Dimension Selection Process"**
Joelias Silva Pinto-Junior, Anderson Ricardo Silvestro, Vinicius Faria Culmant Ramos, João Artur de Souza and Eloi Puertas i Prats

Room 2 PORTUGUESE Session chair : Thaise Moser Teixeira

1 **The Opacity Paradox: Strategic Knowledge Management and Information Sovereignty in Informal Micro-Enterprises**
Pablo Farias Gadal

2 **Dynamics of Knowledge Flows in Brazilian Public Sector Innovation Labs**
Thais Carrier Mendonça and Gregório Varvakis

3 **Smarter without Technology First: The Institutional Logic behind the Integrative Collaborative Framework (ICF)**
Rejane Bolzan, Anderson Saccol Ferreira and Gilson Ditzel Santos

4 **Urban Circularity: Developing a Modular Dashboard to Support Local Knowledge-Informed Policy**
Cristina Sousa, Elisabete Tomaz, Cátia Miriam Costa, Florinda Matos and Maria de Fátima Ferreiro

Room 3 ENGLISH Session chair : Marcelo Macedo

1 **Generative AI, Knowledge Creation, and Responsibility in Social Science Research**
Angel Ford and Radhakrishnan Venkatakrishnan

2 **Federated Discovery of Depression Knowledge Patterns for Risk Prediction**
Yong-Mi Kim and Yasser Youssef

3 **AI Hype or Strategic Necessity? An Exploratory Study of Managerial Perceptions and Technology Adoption in Brazil**
Cecilia Kotzias, Tamer Uzun, Hans Michael van Bellen and Paulo Maurício Selig

4 **Artificial Intelligence and Intellectual Authorship: An Analysis of Contemporary Scientific Production**
Grazieli Pereira, Rejane Sartori and João Paulo Marin

11:50 – 12:20 **Coffee break**

12:20 – 13:20 PLENARY · CIKI ROUND TABLE

Between Algorithms and Neurons: Artificial Intelligence and the Challenges of Contemporary Learning

Roberto Pacheco, Nuno Matos (moderator), Tamer Uzun¸ Angela Regina Heinzen Amin Helou

13:20 – 13:50 PLENARY

Closing remarks and acknowledgments