CRITICAL FACTORS FOR LEVERAGING TECHNOLOGY TRANSFER FROM A TECHNOLOGY INTERFACE CENTER TO THE INDUSTRIAL ECOSYSTEM: THE CASE STUDY OF A METALLOGRAPHY LABORATORY

Cláudia Fernandes & Joana Leal

CATIM – Technological Center for the Metal Working Industry [Portugal]

www.catim.pt

Presentation outline

- Objectives
- Methodology
- Technology transfer
- Results & discussion
- Conclusions

Objectives

- identifying critical success factors for technology transfer practices
- empirically evaluate the critical success factors for technology transfer practices

Methodology

- case study approach
- data collection - metallographic laboratory within the TecIC
  - multiple data collection techniques
  - multiple sources

National, European, and international standardization participation mapping, general standardization documents, standards, semi-structured interviews with interested parties, focus-groups with stakeholders, observations (direct and participant) accreditation documents, technical reports, project outputs and deliverables, and other relevant documents

Data was systematized accordingly to the revised contingency effectiveness model of technology transfer

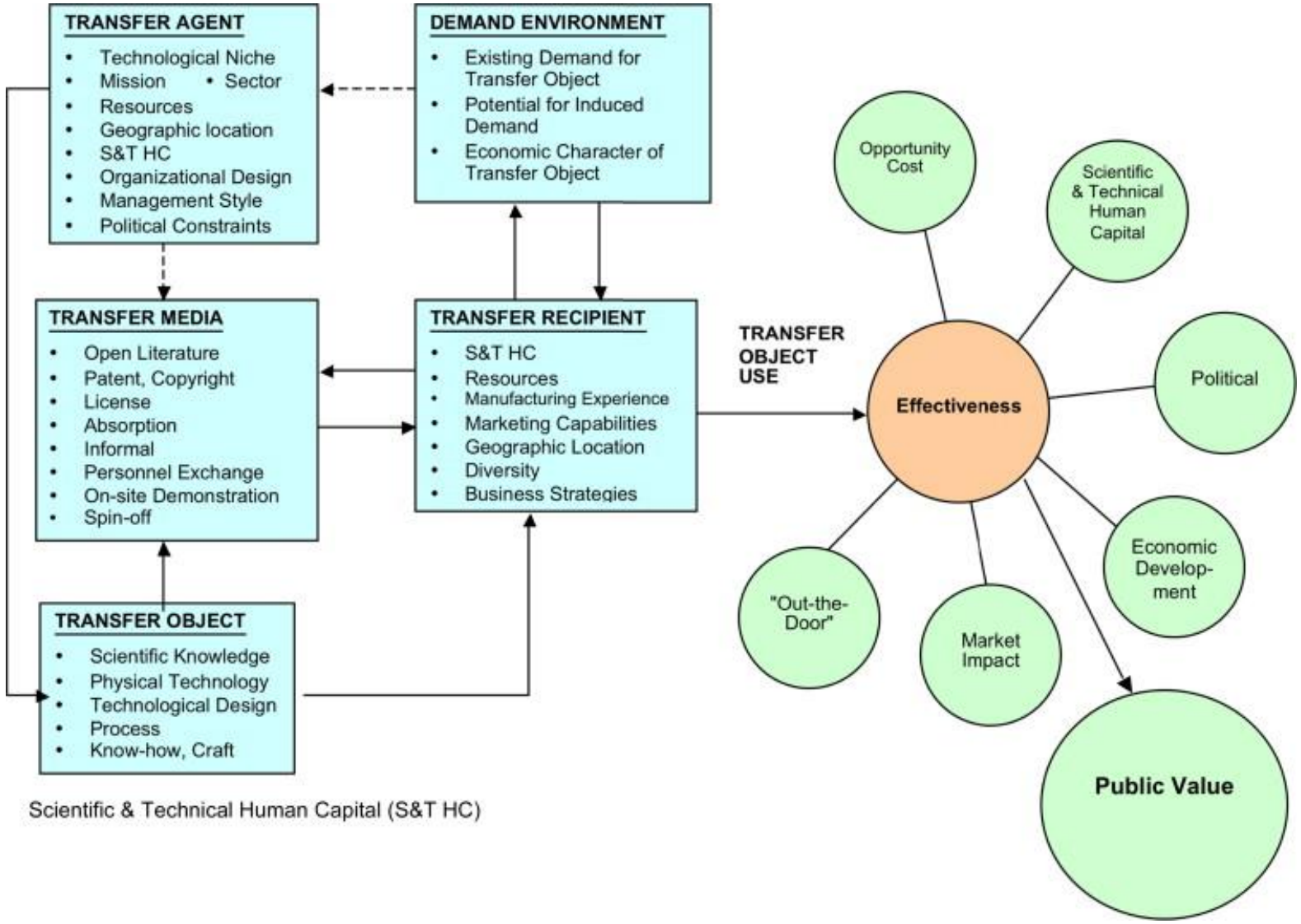
Technology Transfer Practices

Technology transfer practices can be defined as the transfer of physical devices, processes, technical skills, proprietary information *(Bozeman, et al., 2015; Bozeman, 2000)* or technical information transposition from one entity to another.

This transfer can lead to several **outputs** such as dissemination, acquisition of knowledge, experience and/or correlated artefacts *(Silva, et al., 2021; Hameri, 1996),* development of new products or services and access to differentiated markets and/or value networks based on technical knowledge *(Fernandes & Rocha, 2006)* or technological outputs exchange and access to shared innovation resources

Technology Transfer Contingency Effectiveness Model

(Boseman et al. 2015)



Source: Bozeman, B., Rimes, H. & Youtie, J., 2015. The evolving stat-of-the-art in technology transfer research: Revisiting the contingent effectiveness model. *Research Policy,* 44, pp. 36.

25 Critical factors

i) Rationale and practical implications for TTP in four vectors - technology adoption and technological outputs adoption by the industrial ecosystem; networks, standardization, and knowledge creation; lifelong learning/training and team capacitation; and industrial, academic and TecIC ecosystems interaction and knowledge and outputs transfer.

ii) Possible effectiveness criterium according to the revised contingency effectiveness model of technology transfer (Bozeman, et al., 2015) and its perceived potential impact in practices.

iii) Perceived relative impact of these critical factors according to the effectiveness criterium

Critical factors	Effectiveness criterion and relative impact						
	"Out the door"	Market impact	Economic development	Political	Opportunity cost	Scientific and technical human capital	Public value
National standardization participation [2]	++	+++	+++	+	++	+++	+
International and European standardization participation [2]	++	+++	+++	+	++	+++	+
Standards creation and revision [3]	+	+++	+++	++	++	+++	+
Standards transposition to practice (e.g., technical reports, test methods) [1]	+++	+++	+++	++	+++	+++	++
New (or renewed) test methods [1]	+++	+++	+++	+	+++	+++	++
Knowledge creation has support to peer recognition [1]	+++	+++	++	+	+	+++	++
R&D processes and knowledge creation to support audits (first- and second-part audits) [4]	+	+++	+++	+	++	++	+
New technologies available for market use [1]	+++	+++	+++	++	+++	+++	++
New knowledge available for market use [1]	+++	+++	+++	++	+++	+++	++
Knowledge transposition for training and lifelong learning [3]	+++	+++	+++	++	++	++	++
Peer-training and knowledge internalization [3]	+++	+++	+++	++	++	++	++
Technical documents writing [2]	+++	+++	+++	++	++	+++	+
Participation in networks promoted by TeiIC [2]	+++	+++	++	+	+	++	+++
Use of project outputs in day-to-day business [4]	+++	+++	+++	+	+	+	+
I&D KPI to Business [4]	+	+	+++	+	++	+++	+
Technology transfer case studies [2]	+++	++	++	++	++	+++	++
Collaborative R&D development/projects [4]	+++	+++	++	++	+++	+++	+++
Membership in research groups [2]	+++	++	+++	++	++	+++	+
Scientific publications [2]	+++	++	+	++	++	+++	++
International and national conferences [2]	+++	+	++	+	++	+++	+
Training and consulting [3]	+++	+++	++	+	+++	+	+++
Technology surveillance and business intelligence [4]	+++	+++	+++	++	++	+++	+++
Undergraduate and graduate scholarships [3]	+	+	+++	+++	+++	+	++
Strategic networks [2]	+++	+++	+++	+++	++	++	++
Brand registrations [1]	+++	+++	++	+	++	+	++

(1) Technology adoption and technological outputs adoption by the industrial ecosystem, (2) Networks, standardization, and knowledge creation, (3) Lifelong learning/training and team capacitation, (4) Industrial, academic and TecIC ecosystems interaction and knowledge outputs transfer

Expert's level of perceived relative impact in the ecosystem + low impact; ++ median impact; +++ high impact

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Assets, Barriers & Enablers for TTP

Asset	Barriers	Enablers
Cultural	Communication difficulties	Clear communication
	Communication failures	Clear communication
	Misconceptions (e.g., stereotypes)	Correct reality read
Political	Excessive regulations	Favourable regulations
	Incentives	Inflexible rewards
	Difficult access to transfer agents (e.g., TecIC)	Access to transfer agents (e.g., TecIC)
Geographic	Geographic distance	Cluster regions
Organizational	Organizational policy that facilitates transfer and new knowledge adoption	Organizational policy that difficult transfer and new knowledge adoption
	Excessive bureaucracy	Correct information and process design
	Lack of infrastructure	Shared/adjusted infrastructure (e.g., knowledge, technology)
	Inadequate technology	Adequate technology and/or critical shared technological resources
	Lack of economic resources	Availability of economic resources, shared resources
	Proprietary resources	Shared resources (e.g., technology)
	Complexity of the transfer object (e.g., technology, knowledge, knowledge application)	Shared resources (e.g., technical experts, shared technology, networks)
	Lack of interest/knowledge	Interest/knowledge
Personal, individual, or collective	Lack of management skills	Adequate management skills
	Lack of skilled technicians	Technically skilled technicians Shared skilled technicians
	Difficulties in obtaining support from experts in the transfer area	Shared experts in key-transfer areas
	Lack of trust	Trust
	Commitment	Lack of commitment

Conclusions

- This work calls attention for the **central role** of support and development that infrastructures such has **technology interface centers** play in **accelerating technology transfer practices** to the industrial ecosystem, especially in small and medium sized enterprises or highly differentiated organizations.

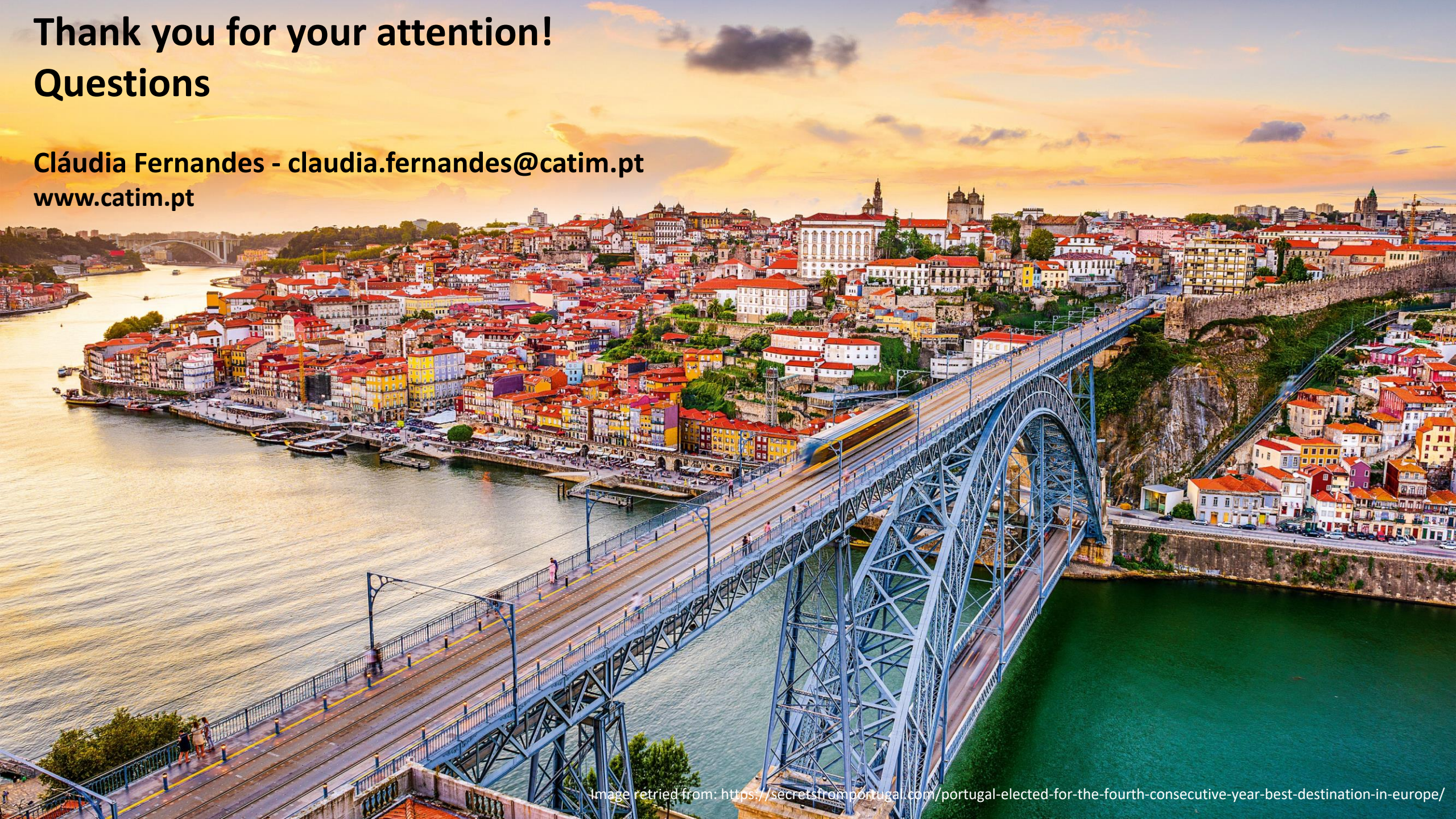
- The adoption by the **industrial ecosystem** of new or renewed processes and practices are also mediated and potentiated by the differentiated **access to knowledge networks**, **access to technology**, and **technology mediated outputs** such as the one promoted by TecIC

ACKNOWLEDGMENTS

This research was funded by POR NORTE2020, under the Portugal2020 Partnership Agreement, through the European Regional Development Fund (ERDF); Grant Number: NORTE-01-0246-FEDER-000049.

Thank you for your attention!
Questions

Cláudia Fernandes - claudia.fernandes@catim.pt
www.catim.pt



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