Trust Management in Emerging countries:

International cooperation research challenges for Horizon 2020

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Overview

- BIC **WG1** – Human Oriented approaches to Trust and security

  – Partners - France, India, South Africa

- Emerging economies

- Trust Management – Why do we need International Cooperation (INCO)

  – Trust from the European/western perspective

  – Other approaches considering culture

  – Cultural perspectives

- Research challenges

- INCO collaboration

Emerging economies

- **BRICS i**s the title of an association of emerging national economies: **B**razil, **R**ussia, **I**ndia, **C**hina and **S**outh Africa.

- BRICS members are all developing or newly industrialised countries, but they are distinguished by their large, fast-growing economies and significant influence on regional and global affairs.

- As of 2013, the five BRICS countries represent almost 3 billion people, with a combined nominal GDP of US$14.8 trillion, and an estimated US$4 trillion in combined foreign reserves.

Emerging economies characteristics

- Emerging economies have a large, young labor force – usually about 50% of the population is less than 20 years old.

- Infrastructure is challenging (banking, transportation, distribution channels, government bureaucracy).

- Government tends to be the largest industry/economic player. In China for example, government accounts for 1/3 GDP.

- Somewhat autocratic leadership.
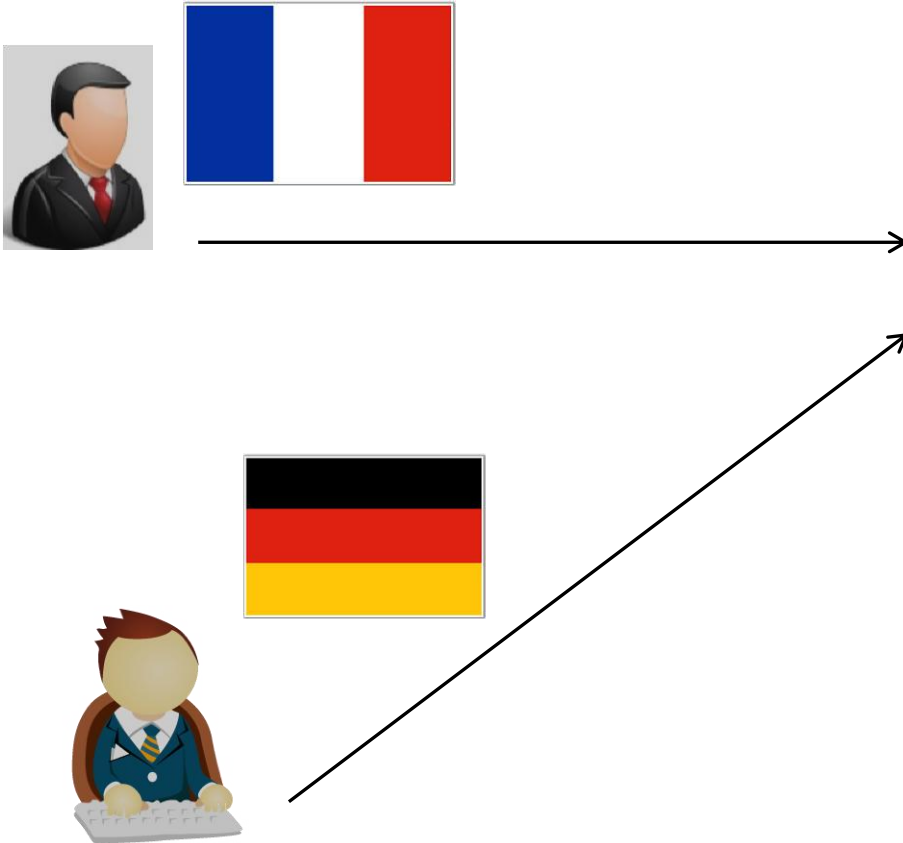
- Varying levels of corruption.

African / Indian need for INCO
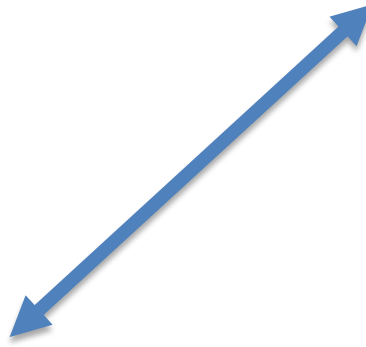
How to choose a partner?
How to trust technology?

European need for INCO

How to configure a product so that everyone will use it successfully?

Trust Management

European / Western perspective

Deutsch (1958)

An individual may be said to trust that an event will occur if he expects its occurrence and his expectation leads to behavior that he perceives to have greater negative motivational consequences if the expectation is not confirmed than the positive motivational consequences if it is confirmed.

Gambetta (1988)

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Trust is the firm belief in the competence of an entity to act dependably, securely, and reliably within a specified context.
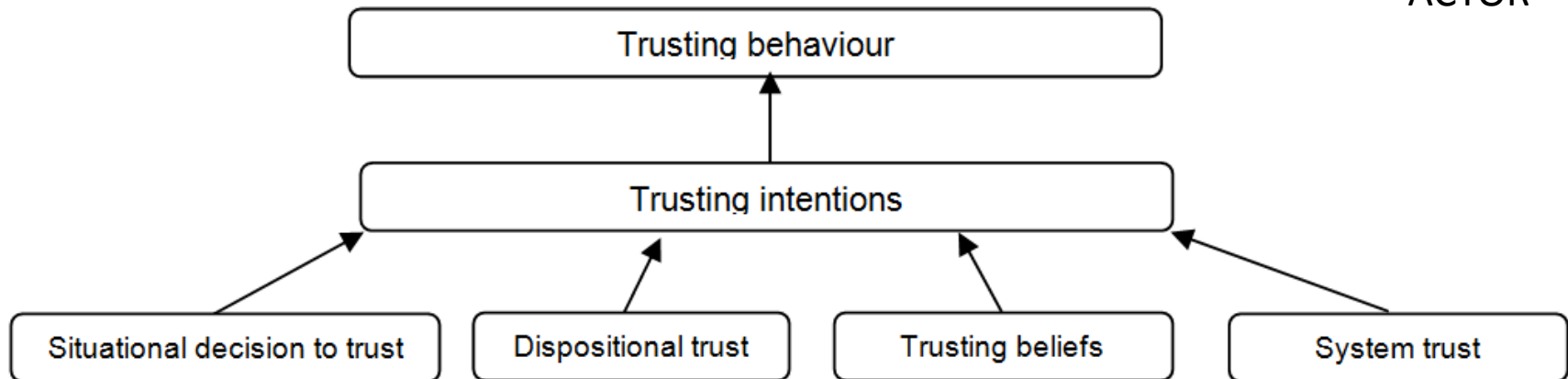
Trust Management

European / Western perspective

Prisoners' dilemma

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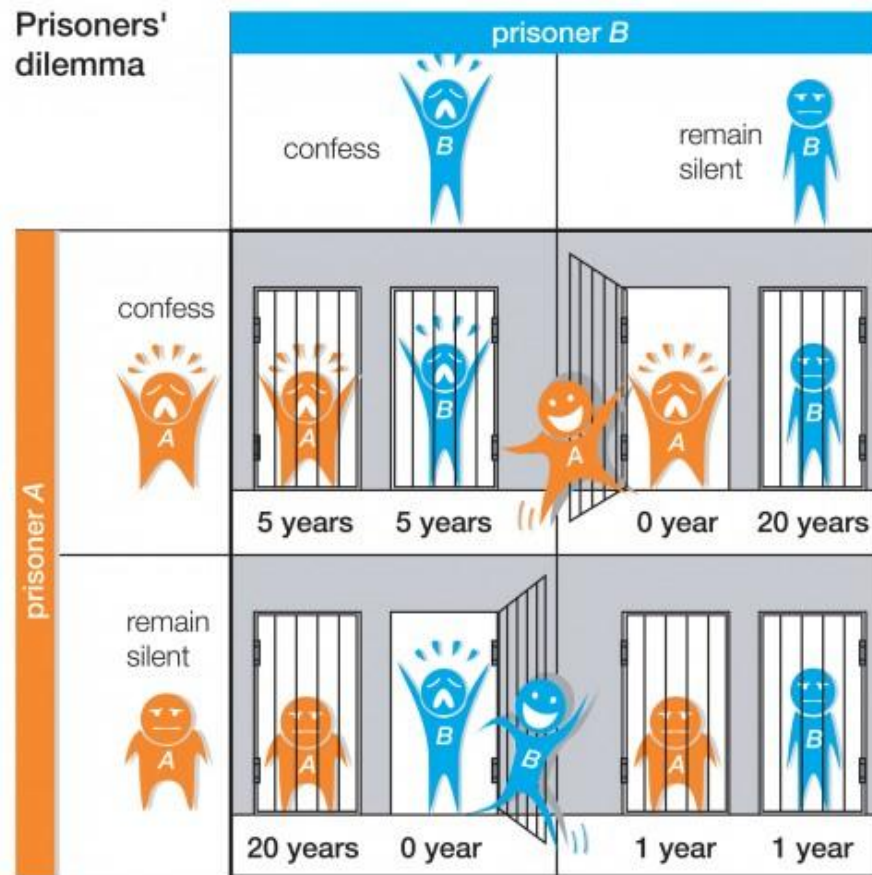
Trust Management

European / Western perspective

- **Trust constructs**

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┌─────────────────────────────────────────┐
│           Trusting behaviour             │
└─────────────────────────────────────────┘
                    ▲
┌─────────────────────────────────────────┐
│           Trusting intentions            │
└─────────────────────────────────────────┘
    ▲           ▲           ▲          ▲
┌──────────┐ ┌──────────┐ ┌─────────┐ ┌──────────┐
│Situational│ │Dispositio-│ │Trusting │ │ System   │
│decision to│ │nal trust  │ │beliefs  │ │ trust    │
│  trust    │ │           │ │         │ │          │
└──────────┘ └──────────┘ └─────────┘ └──────────┘
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- **Trust computation**

   PeerTrust mode $T(u) = \alpha * \sum_{i-1}^{I(u)} S(u,i) * Cr(p(u,i)) * TF(u,i) + \beta * CF(u)$

Trust Management

European / Western perspective

Dispositional trust

- generally higher
- risk taker
- trust strangers
- rule-based environment

System trust

- institutional guarantees
- laws and policies
- information security mechanisms

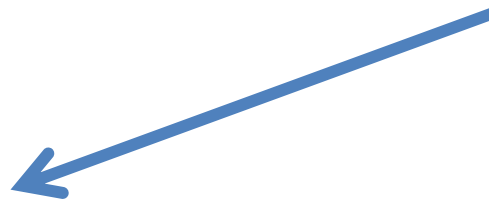**Trusting beliefs**

- ability
- integrity
- benevolance

- analytical
- express explicitly
- muscular nature

Feedback system

Detailed Seller Ratings	(since May 2007) ?	
Criteris	Average rating	Number of ratings
Item as described	★★★★★	93
Communication	★★★★★	93
Shipping time	★★★★★	94
Shipping and handling charges	★★★★★	93

Trust Management

European / Western perspective
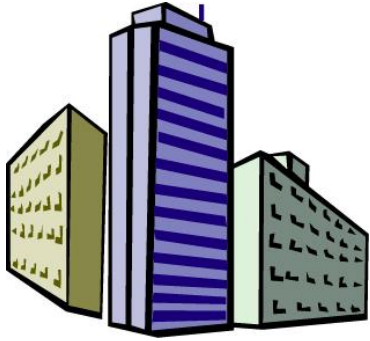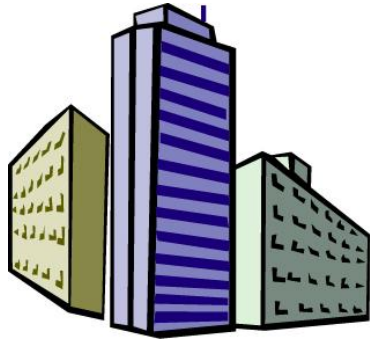
Social controls

Institution guarantees

Rule of law

Assurance

Security
Identity, confidentiality etc..

In contrast…

In contrast…

Social controls

Institution guarantees

Rule of law

Assurance

Security
Identity, confidentiality etc..

Culture?

"the collective programming of the mind that distinguishes the members or one group or category of people from another"
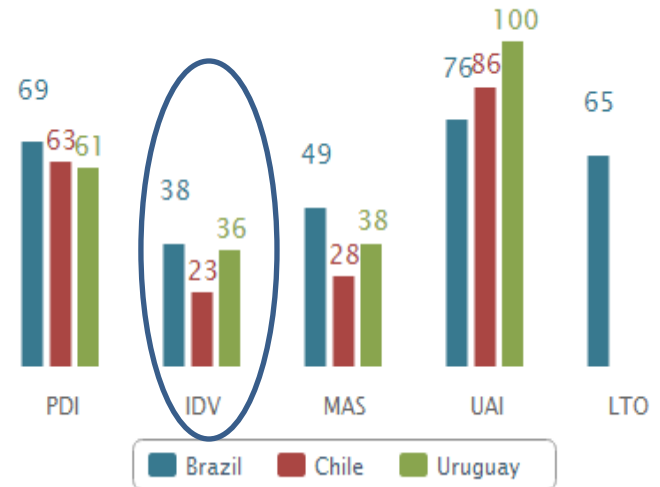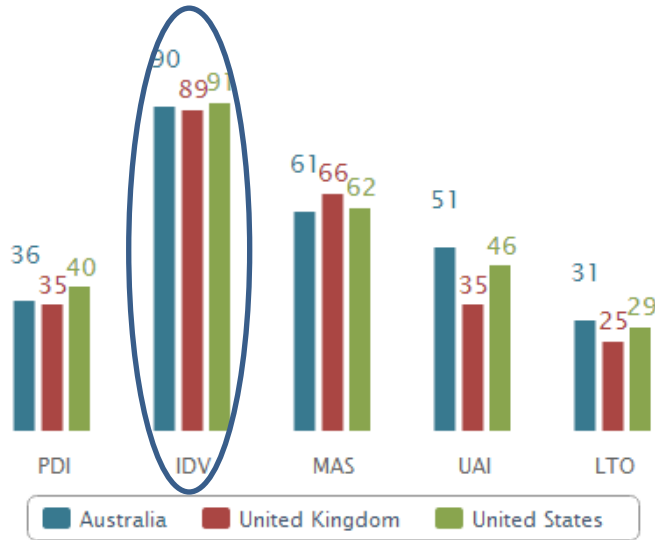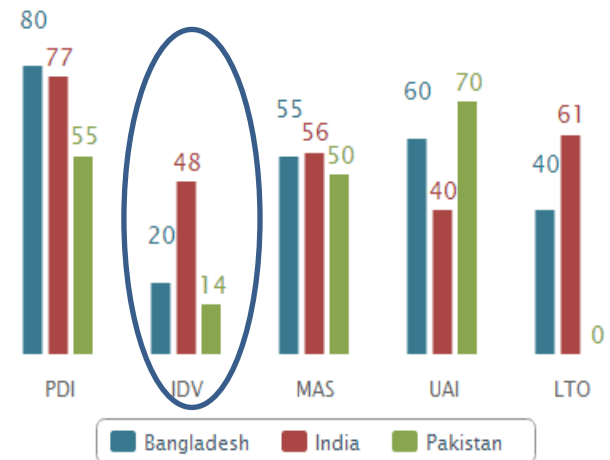
Hofstede (1980)

Hofstede's 5 dimensions of culture:

- power-distance
- femininity vs. masculinity
- uncertainty avoidance
- long-term vs. short-term orien
- **collectivism vs. individualism**

West vs. South America vs India

PDI - Power distance
IDV – Individualism [collectivism]
MAS - Masculinity / Femininity
UAI - Uncertainty avoidance
LTO - Long term orientation

Individualism vs collectivism

personal freedom and achievement   **embeddedness of individuals in a larger group**

| Individualism	Collectivism
Everyone is supposed to take care of him- or herself and his or her immediate family only	People are born into extended families or clans which protect them in exchange for loyalty
"I" – consciousness	"We" –consciousness
Right of privacy	Stress on belonging
Speaking one's mind is healthy	Harmony should always be maintained
Others classified as individuals	Others classified as in-group or out-group
Personal opinion expected: one person one vote	Opinions and votes predetermined by in-group
Transgression of norms leads to guilt feelings	Transgression of norms leads to shame feelings
Languages in which the word "I" is indispensable	Languages in which the word "I" is avoided
Purpose of education is learning how to learn	Purpose of education is learning how to do
Task prevails over relationship	Relationship prevails over task

Trust Management

Collectivist approach…

Dispositional trust

- Generally lower
- Not risk taker
- No trust in strangers
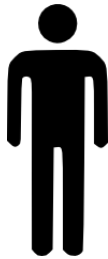
System trust

- No system trust
- Prefer to comply to group opinion

Trusting beliefs

- Group??
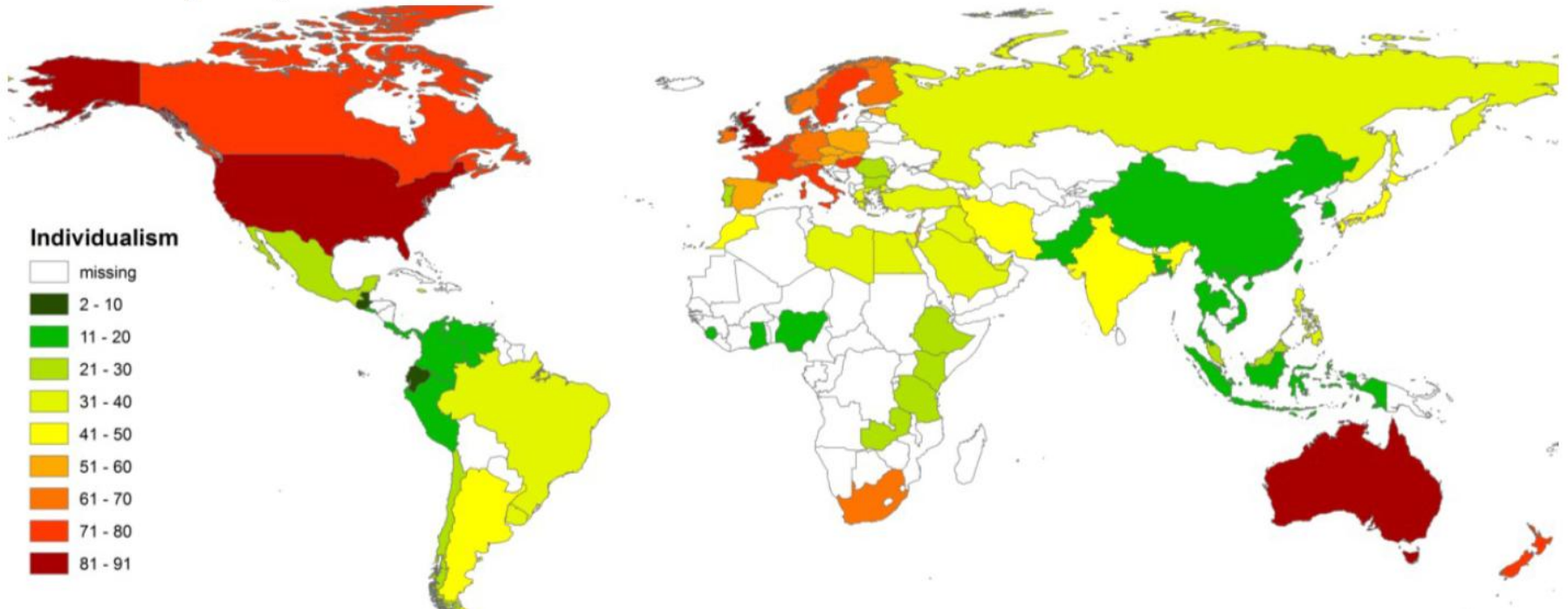- Ability not too important if group is disadvantaged

- Does not want to offend

Feedback system

Detailed Seller Ratings (since May 2007) ?

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Individualism

Hofstede's (2001) measure of individualism.

Individualism in Europe

|	
▨	0-10%
▢	10-20%
▨	20-30%
▨	30-40%
▨	40-50%
▨	50-60%
▨	60-70%
▨	70-80%
▨	80-90%

Eupedia map of Individualism
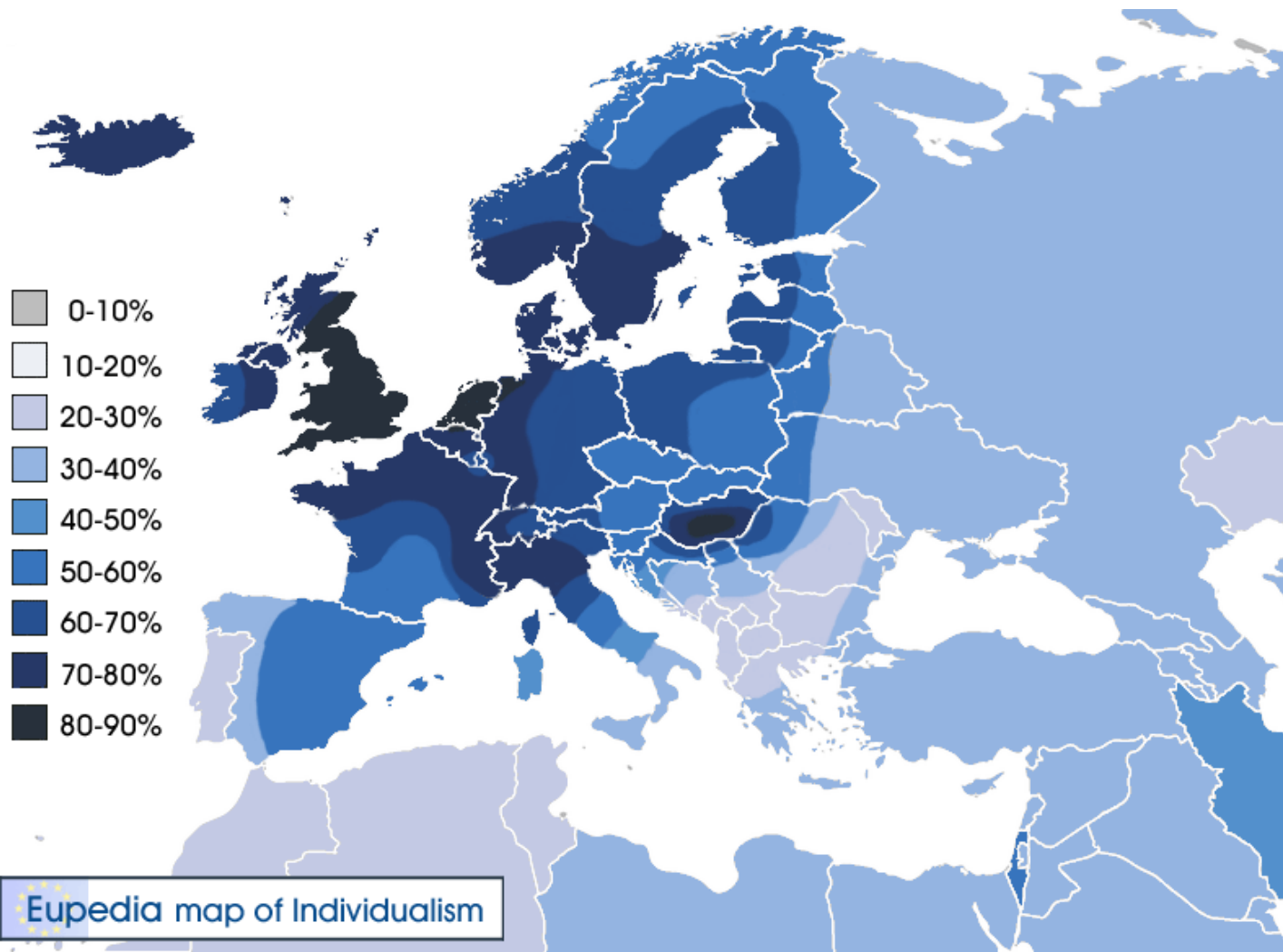
The core of a culture formed by values

**Schwartz represents a model based on 10 value types and four cultural dimensions**

1. **Power (PO)**: Social status and prestige, control or dominance over people and resources.

2. **Achievement (AC):** Personal success through demonstrating competence according to social standards.

3. **Hedonism (HE):** Pleasure and sensuous gratification for oneself.

4. **Stimulation (ST):** Excitement, novelty, and challenge in life.

5. **Self-Direction (SD):** Independent thought and action choosing, creating, exploring.

6. **Universalism (UN):** Understanding, appreciation, tolerance and protection for the welfare of all people and for nature.

7. **Benevolence (BE):** Preservation and enhancement of the welfare of people with whom one is in frequent personal contact.

8. **Tradition (TR):** Respect, commitment and acceptance of the customs and ideas that traditional culture or religion provide the self.

9. **Conformity (CO):** Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.

10. **Security (SE):** Safety, harmony and stability of society, of relationships, and of self

The core of a culture formed by values

consistently-occurring human values
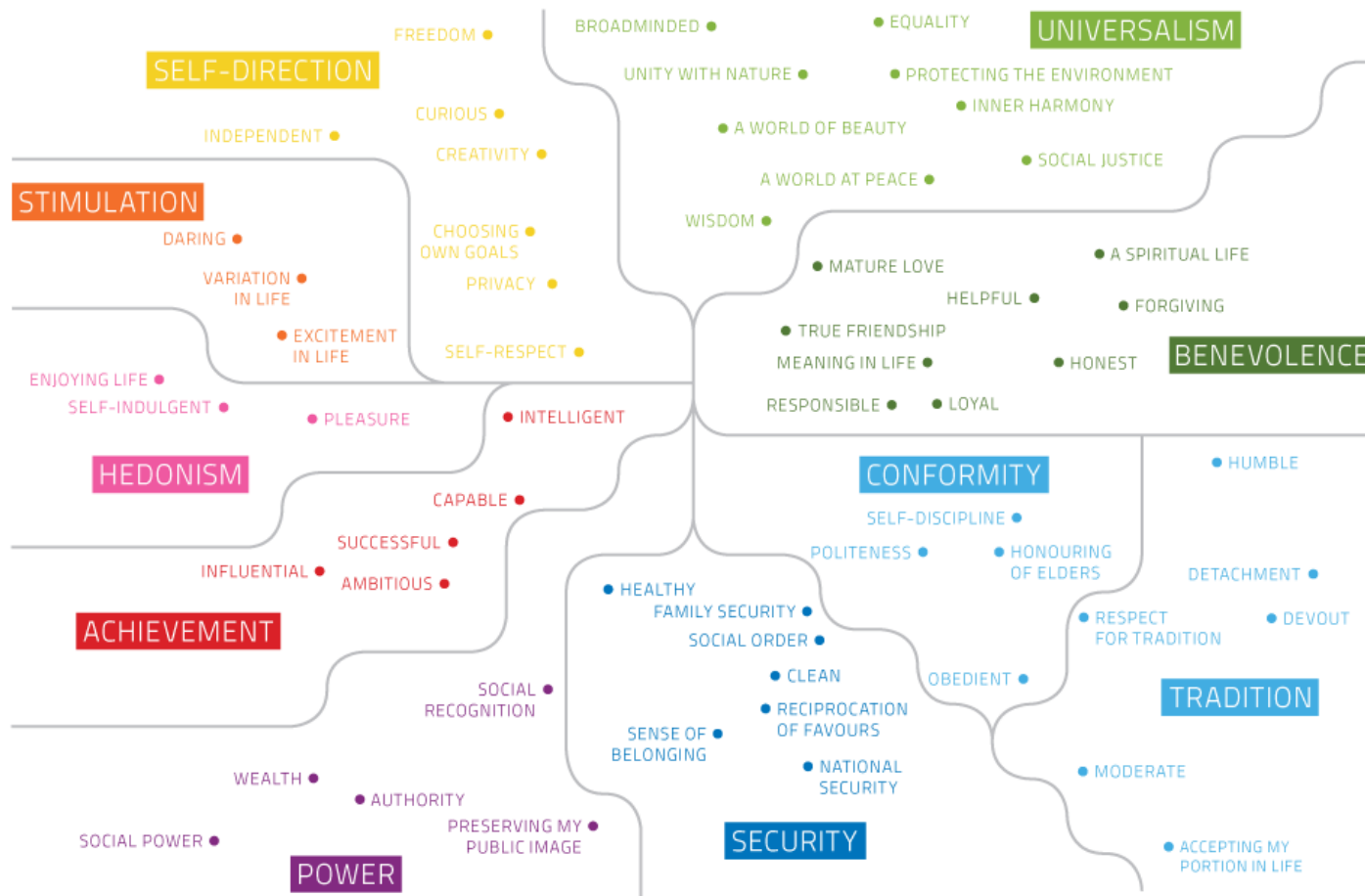
The core of a culture formed by values
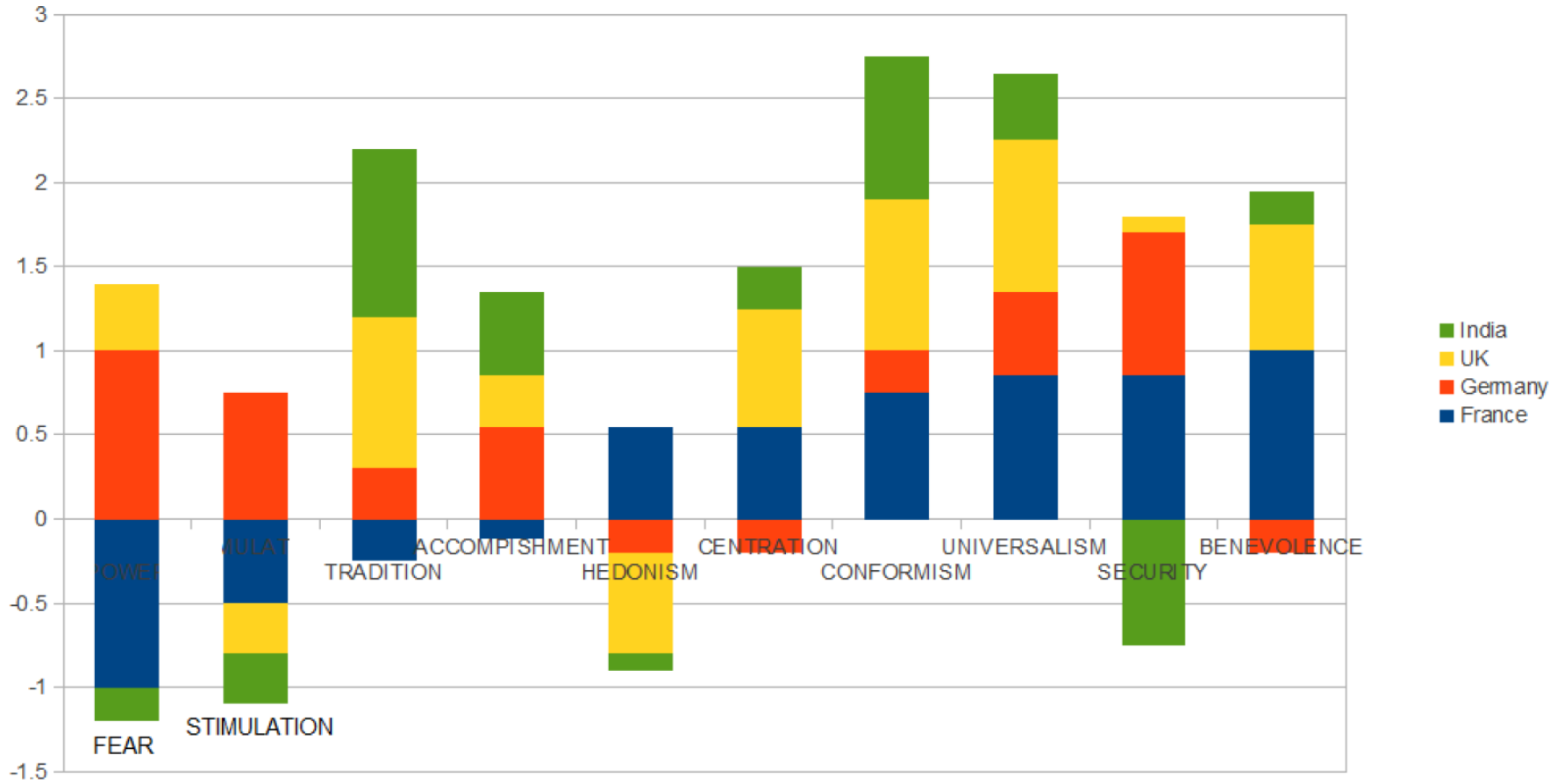
Trust Management

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Trust is the firm belief in the competence of an entity to act dependably, securely, and reliably within a specified context.

New definition: "*The activity of collecting, encoding, analysing and presenting evidence relating to competence, honesty, security or dependability, with the purpose of making assessments and decisions regarding trust relationships, **while at the same time considering the influence of culture and beliefs**.*"

Research Challenges
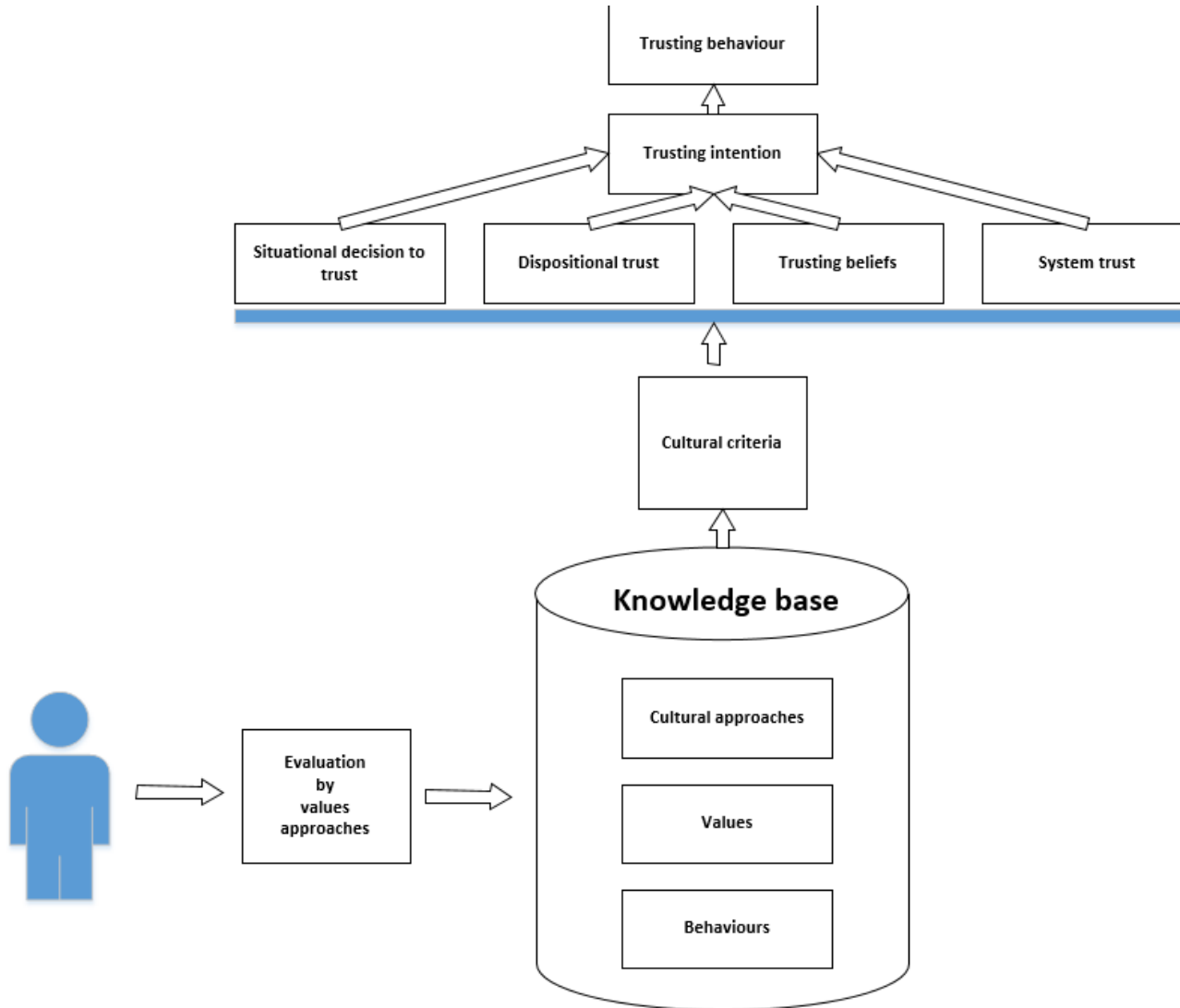
INCO collaboration – research challenges

- Gain an understanding of existing cultural frameworks to determine the most suitable framework to use to extract cultural behaviors and beliefs.

- Determine how individualist cultures have influenced the development of trust management to date.

- Determine the manner in which current trust management systems not meet the needs of collectivist cultures at each of the identified layers of the trust development framework.

- Identify specific trust mechanisms that can be adapted for collectivist cultures to better suit their needs.

- Define and develop culturally specific trust mechanisms and models to address the needs of a cultural group.

INCO collaboration – research challenges

- How can we investigate into the effects of culture in understanding computer security?

- How should we define "culture" in this context? What is it, exactly, made of?

- How should we define security-related concepts, such as privacy, or trust, for multi-cultural environments?

- How can we make cultural comparisons across users from various countries? What is relevant for the study of cultural effects?

- How "weighty" are cultural considerations for the overall design of security-prone systems?

- What will the future culture of secure Internet and secure and private mobility be like?

INCO collaboration – research challenges

- Building a framework for culture analysis within the frame of trust and security;

- Characterization and understanding of the cultural differences using this framework;

- Co-creation of culturally-adapted indicators for trust and security for a better efficiency of awareness actions;

- Construction of an International Reputation Index for trust and security that allows transparency;

- Building a methodology to transform user requirements into real industrial requirements;

- Feeding policy makers and standardisation bodies with these constraints coming from multi-disciplinary, multi-cultural and end-users needs.

Main objective + success metric

The long-term expected outcome of this work would be a

- generic framework that supports the ability to adapt trust models to culture, in a very generic manner,

- thereby complementing other research conducted in the trust research community

- A success metric for this work would include a working prototype, evaluated in a real life context in one or more of the countries

Stakeholders (Others welcomed to Join with us!)

South Africa

- University of Johannesburg,
- SAP Research, Pretoria

India

- Indian government and industry
- Department of Management Studies at IIT Delhi
- Beyond Evolution Tech Solutions Pvt. Ltd., India

France

- I3S Laboratory - University of Nice Sophia Antipolis/CNRS
- Ability Europe Ltd, United Kingdom

Ireland

- Waterford Institute of Technology, Waterford, Ireland