

THE INNOVATION JOURNEY: FROM IDEA TO NOVELTIES

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LUXEMBOURG
INSTITUTE
OF SCIENCE
AND TECHNOLOGY



THE MERGER OF TWO MAJOR PUBLIC RESEARCH ACTORS IN LUXEMBOURG



In April 2012,
CRP Gabriel Lippmann and CRP Henri Tudor announced
their intention to merge.

On January 1st, 2015 a new RTO is born



MAIN FIGURES

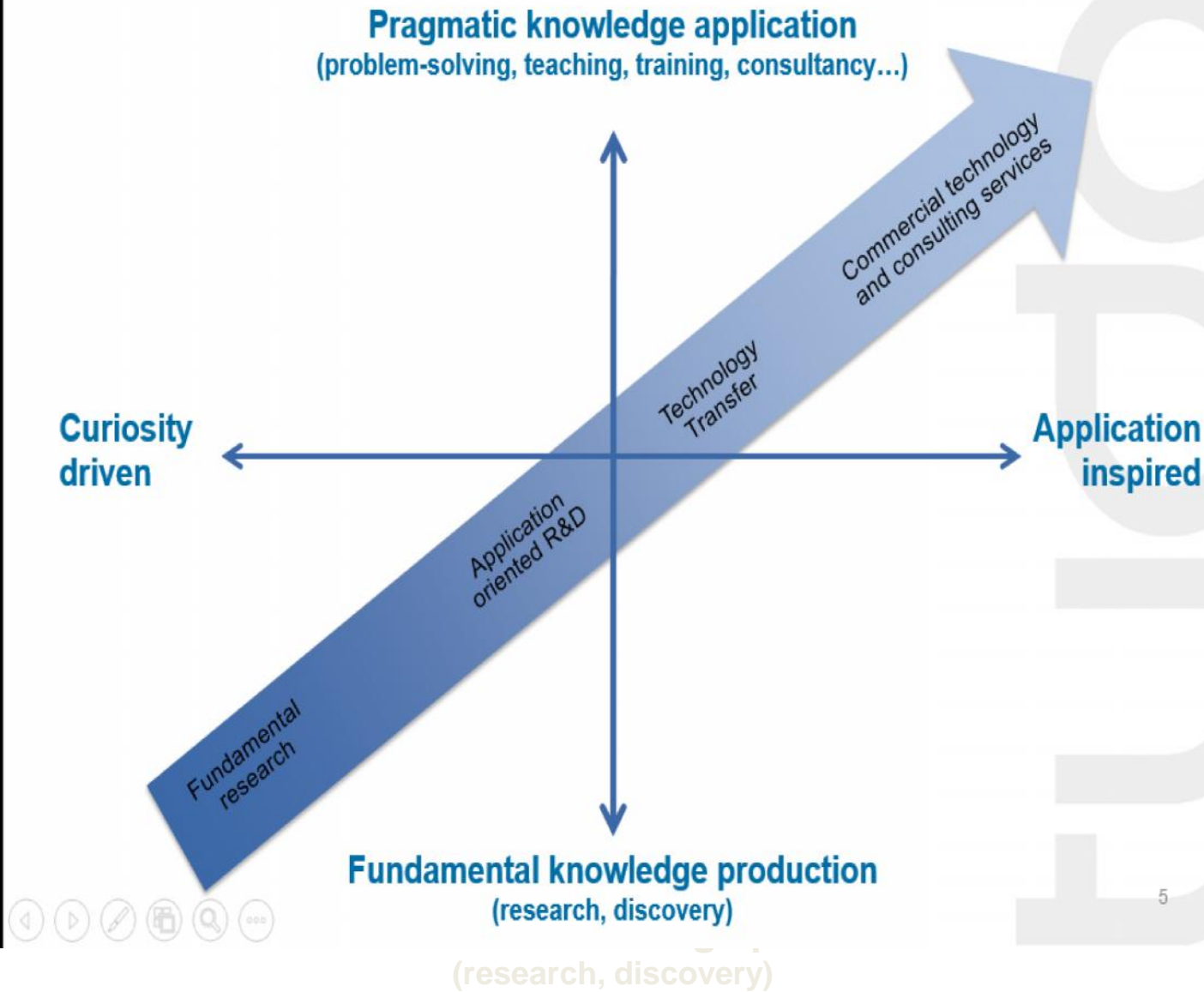
- A budget of approximately: **EUR 64 million***
- Contract research: **EUR 10.5 million***
- Competitive research: **EUR 14.5 million***
- **630 employees**, $\frac{3}{4}$ of whom are researchers
- About **70** Phd students
- Nearly **40** different nationalities represented
- **350** scientific publications referenced
- A portfolio of **50** patent families

The expertise of LIST's researchers is deployed in close to 300 research projects, 30% of which are conducted within European programmes

*2015 Objectives of the Performance Contract signed with the Luxembourg govt for the period 2015-2017

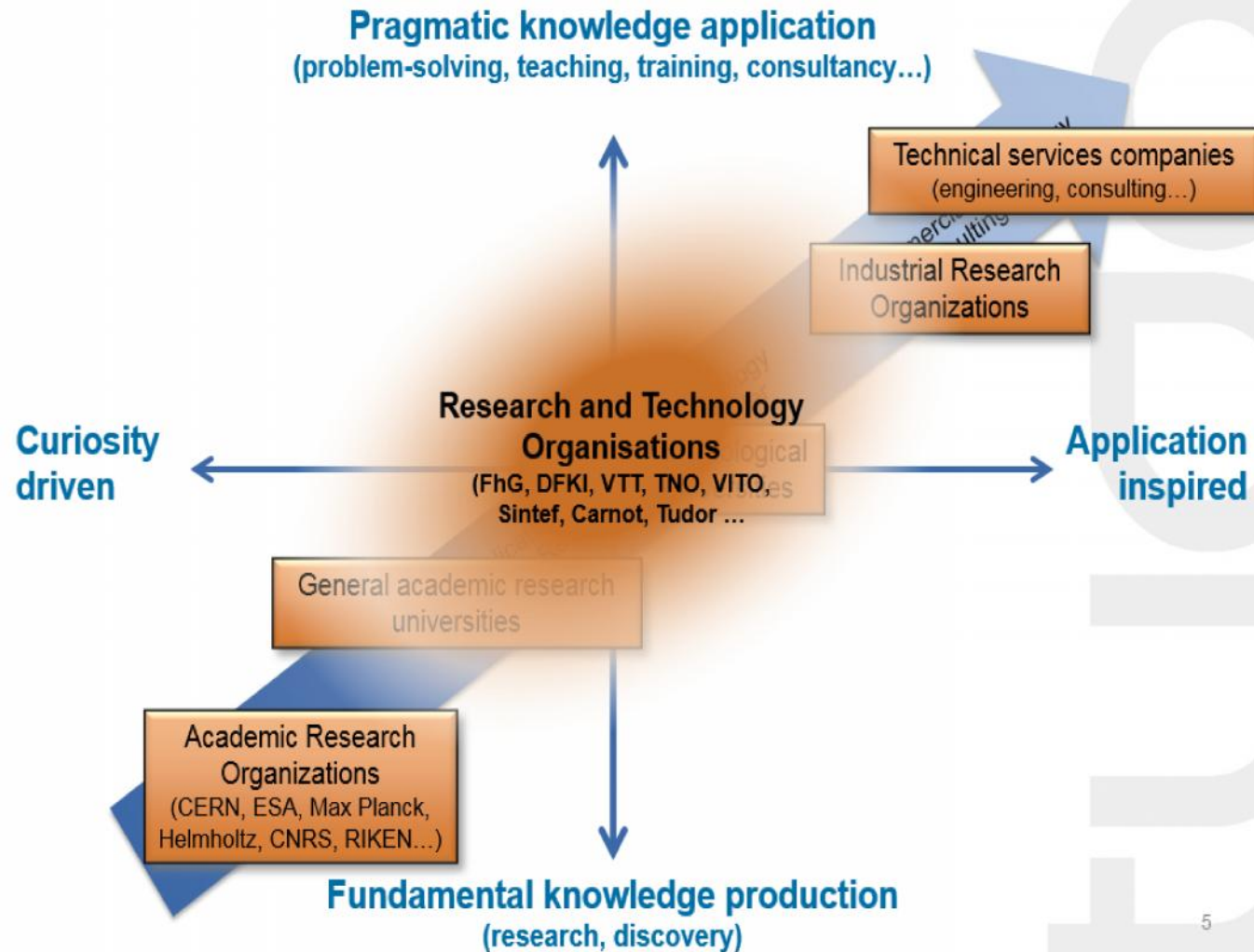
RTOs: linking academia and industry

(source: EARTO)



RTOs: linking academia and industry

(source: EARTO)



3 DEPARTMENTS WITH FOCUSED RDI DOMAINS

IT FOR INNOVATIVE SERVICES (ITIS)

- Decisional knowledge dynamics
- Trusted service systems
- Service engineering with impact

MATERIALS RESEARCH AND TECHNOLOGY (MRT)

- Nanomaterials & nanotechnologies
- Composite & advanced materials

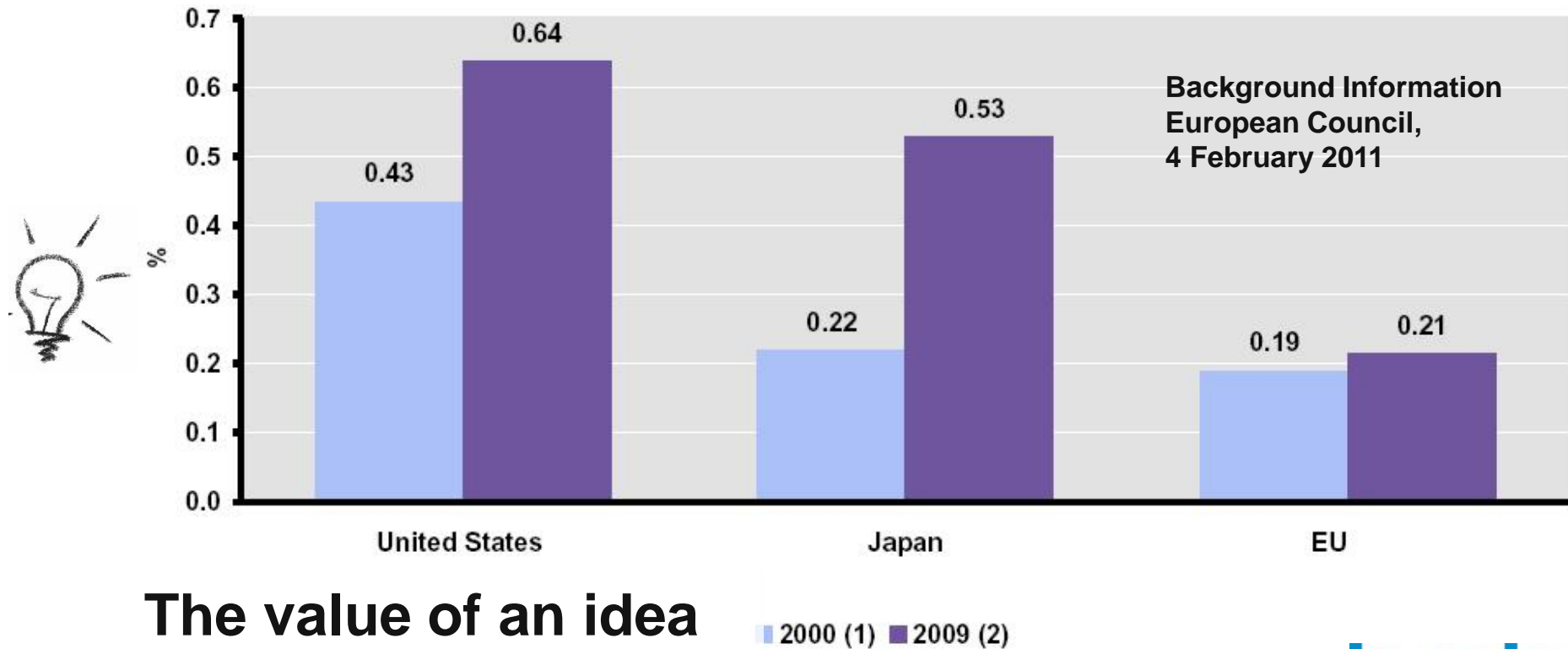
ENVIRONMENTAL RESEARCH AND INNOVATION (ERIN)

- Water security & safety
- Plant for biomass, biopolymers & bioenergy
- Life cycle sustainability & risk assessment
- Environmental informatics



EU: ABILITY TO PROFIT FROM PATENT

Licence revenues in US, Japan and EU (% of GDP, 2000 and 2009)



The value of an idea
lies in the using of it
Edison

SOME SURVEY-BASED EVIDENCE

EUROPE IS PARTICULARLY WEAK IN THE **TRANSFORMATION OF IDEAS IN NEW PRODUCTS AND SERVICES.**

(European Cluster Memorandum)

PRODUCTIVITY OF R&D MUST BE INCREASED.

(Aho-Report)

ENTREPRENEURSHIP CULTURE IS CRUCIAL TO FOSTER ECONOMIC GROWTH.

(OECD)

INITIATIVES OFTEN FAIL TO **ADDRESS THE TRANSNATIONAL DIMENSION OF KNOWLEDGE TRANSFER.**

(European Commission)

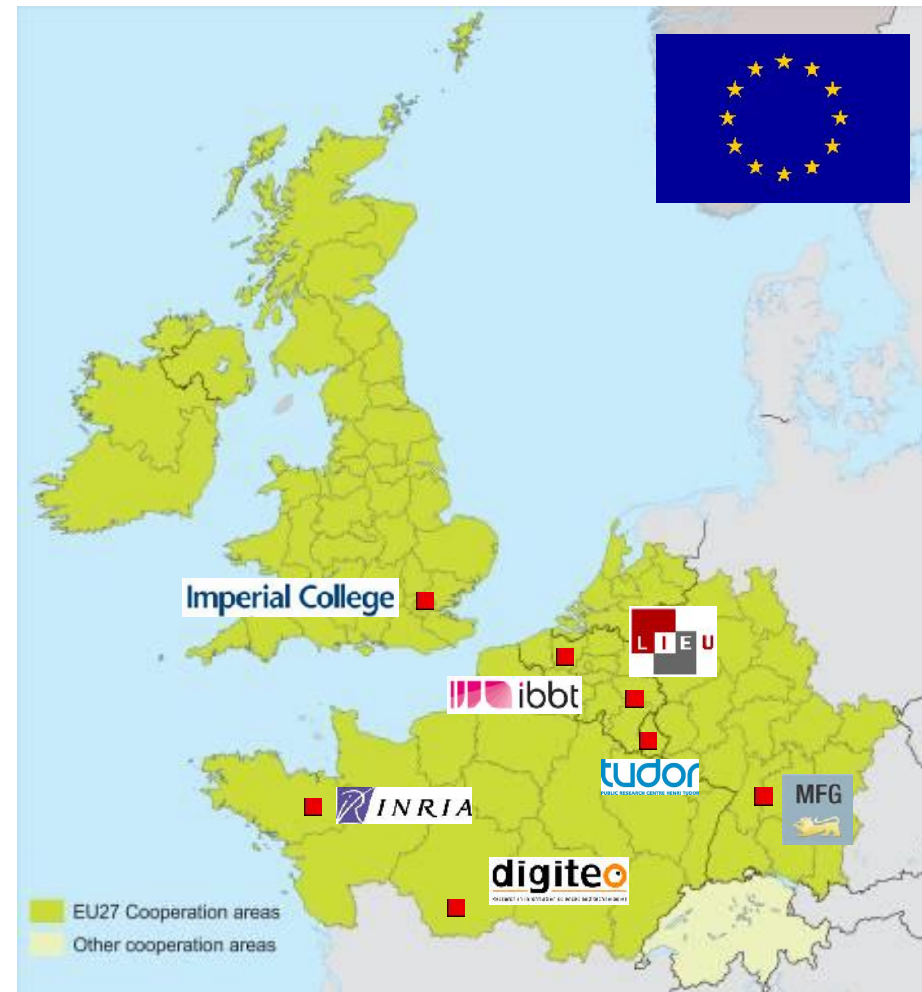
**There is a need for action:
to improve the transfer process**

FITT ...

• FITT =
Fostering Interregional
Exchange in ICT
Technology Transfer

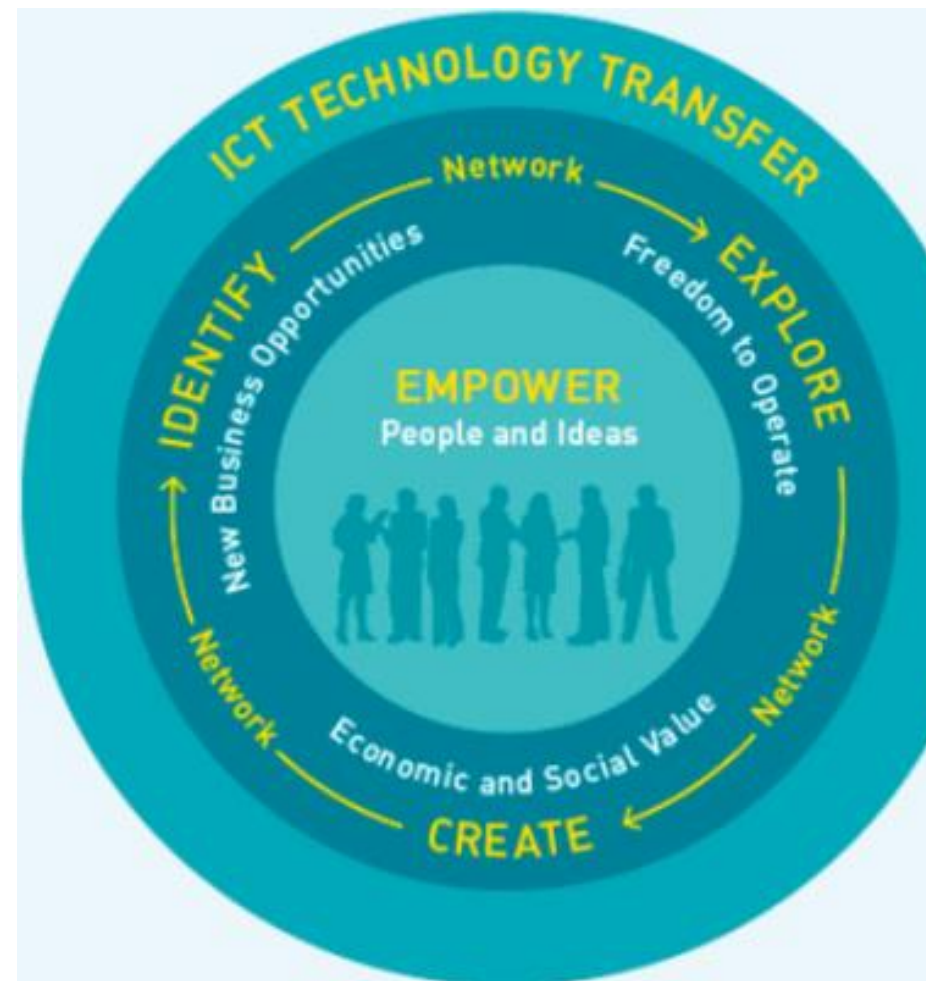


- Co-funded by EU
- June 2008 – May 2011
- 4.300.000 €
- 7 Partners – 5 Countries



WHAT DID WE DO ABOUT IT?

- Practitioners / Pragmatic approach
- A unique Professional framework
- A practical model for building up a successful business, supported by practical and academic evidence.
- How to create economic / social value from knowledge ?



FITT Logic



INTERREG IVB

The FITT Toolbox

More than 60 topics

... a collection of practical tools ready made for tech transfer

... full of (best-) practices, case studies, instruments, external sources and articles

... with a modular structure

... all to do with a practical focus for people with little time to study



And there is more to FITT

The FITT Toolbox
...is also about

A vivid Community of Practice

The recommended Bibliography

A Transnational Training Program

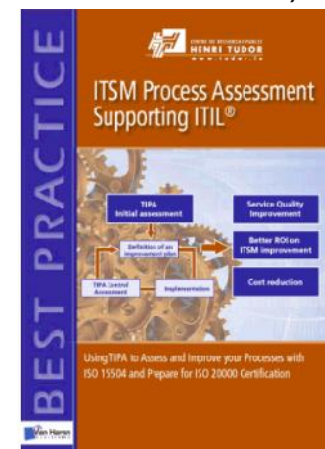
A Position Paper

TIPA® - TUDOR IT SERVICE MANAGEMENT (ITSM) PROCESS ASSESSMENT

www.tipa-itsm.com



- Problem/Idea
 - How to demonstrate the quality of IT service management in organizations ?
- Solution & Partners
 - TIPA, a framework to assess and improve service management processes based on an international standard (ISO/IEC 15504) and ITIL® (set of best practices in IT Service Management)
 - Van Haren Publishing
 - itSMF, Dimension Data (LU), BCE (LU)
- Validation
 - 12 published articles in reviewed journals and conferences
 - Validation by national experts (itSMF) and early adopters (Dimension Data, BCE/RTL)
- Valorisation
 - Tudor is co-editor of the ISO 20000 series (Part 4)
 - Publication of a book by an international publisher
 - Partnership for the distribution of the associated materials at international level



TAO[®] - TESTING ASSISTÉ PAR ORDINATEUR

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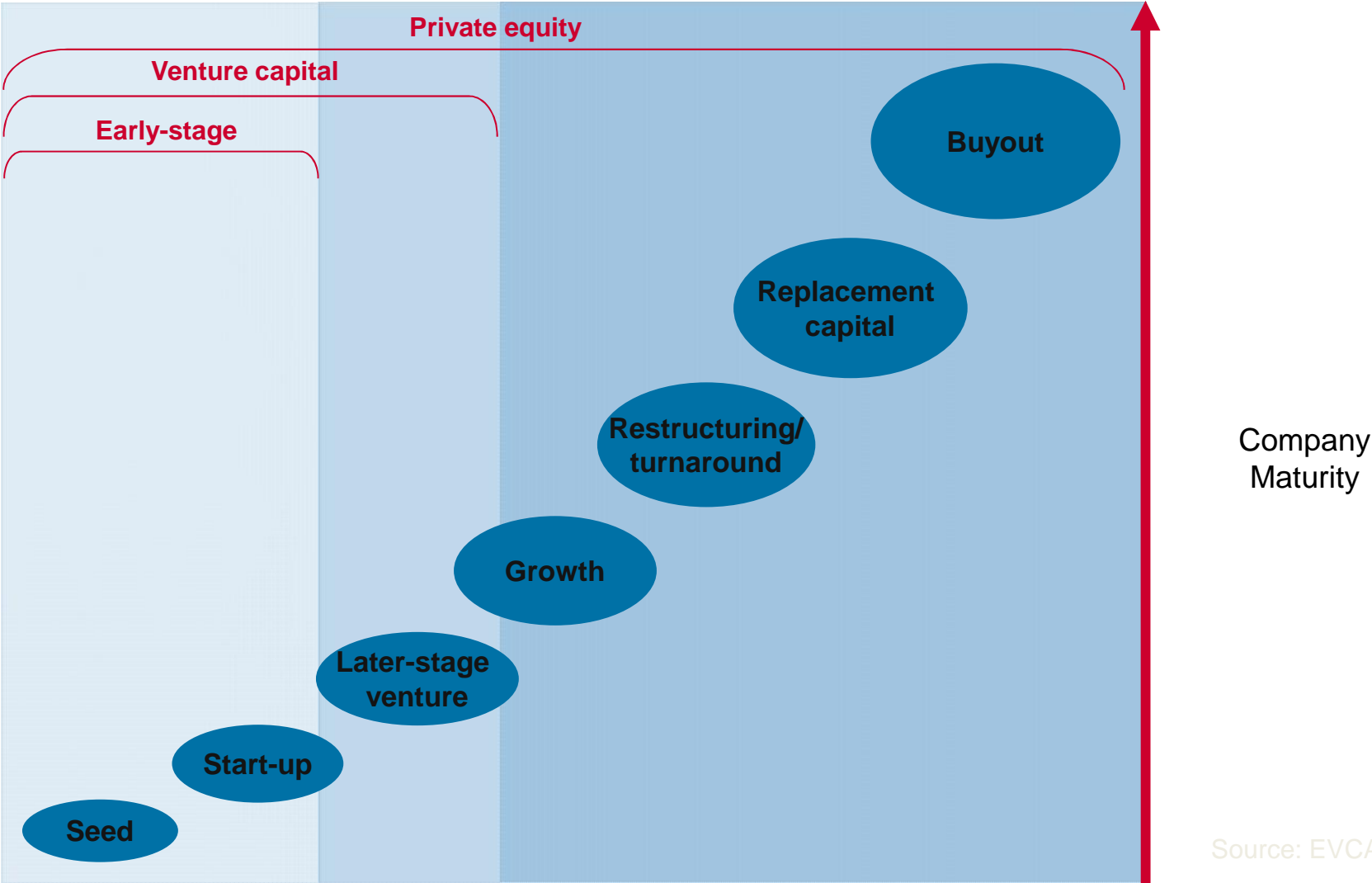


www.tao.lu

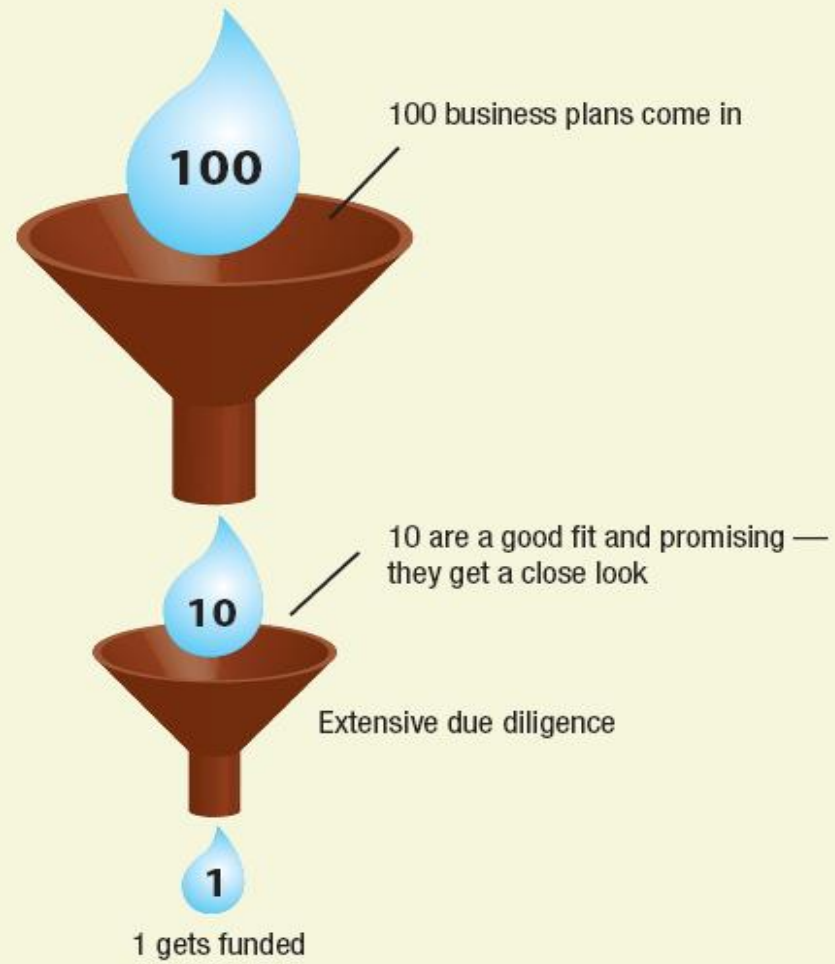
- Problem/Idea
 - Use ITC technologies in order to replace paper/pencil based testing methods for the large scale evaluation of competences
- Solution
 - An Open Source Computer Based Assessment Platform that provides all actors of the entire assessment process a comprehensive set of functionalities enabling the creation, the management, and the delivery of electronic assessments and surveys
- Validation
 - Joint initiative with University of Luxembourg
 - Numerous scientific publications and international partnerships (DIPF (DE), ETS (USA), ACER (AUS), University of Szeget (HU), University of Luxembourg)
 - Utilisation by OECD in it's well-known large-scale PISA (Programme for International Student Assessment) and PIAAC (Programme for International Assessment of Adult Competencies) studies in 2009 and 2012
- Valorisation
 - 2 trademarks, licence granting
 - service for national and international surveys



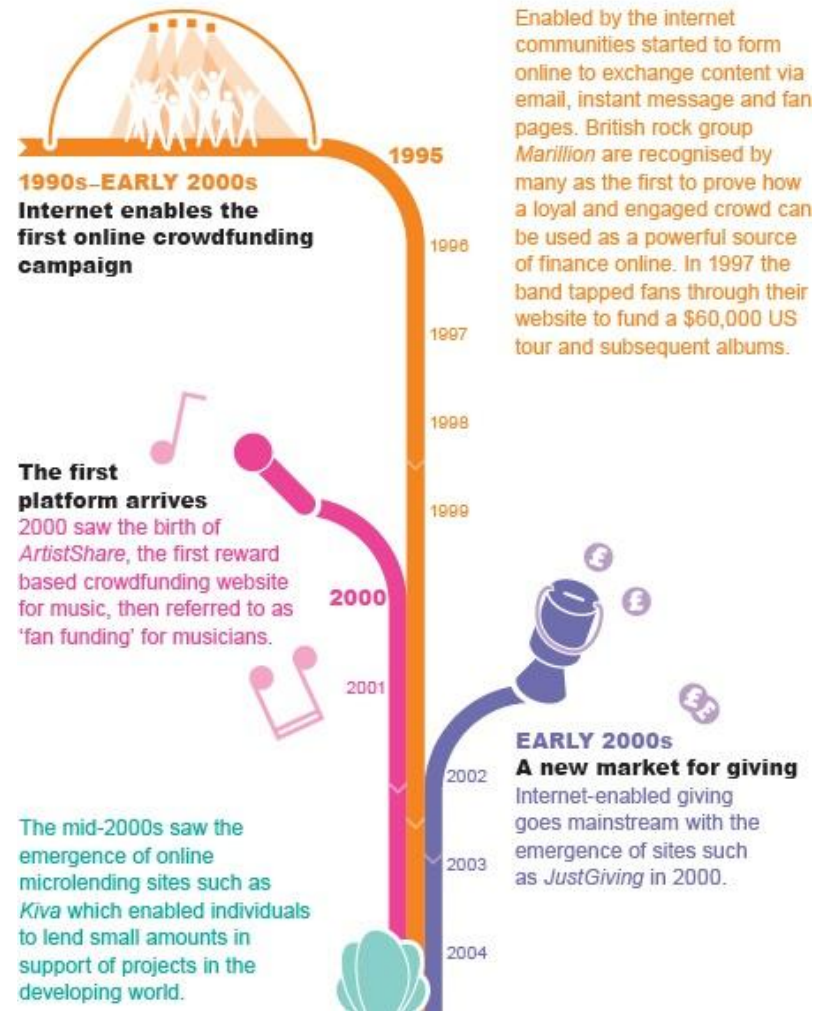
PRIVATE EQUITY FUNDING



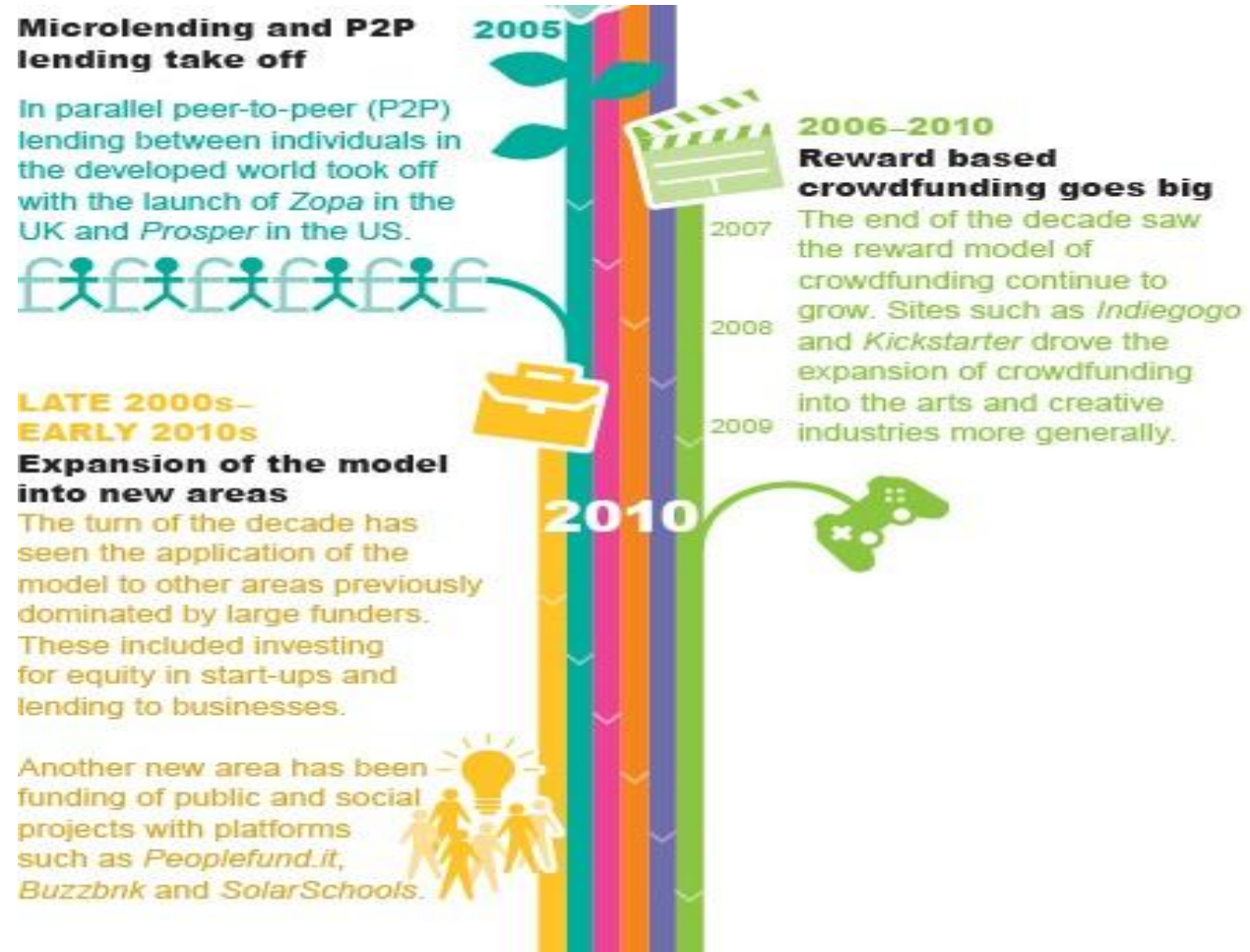
The Business Plan Funnel



A super short history of modern crowdfunding



Source:
<http://www.nesta.org.uk/news/history-crowdfunding>



GLOBAL CHALLENGES

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What are
the **greatest**
challenges
facing the
world in
2015?

North America Key challenges

- 1 Increasing inequality
- 2 Geopolitical shifts
- 3 Adapting to climate change

Europe Key challenges

- 1 Fostering economic growth and innovation
- 2 Youth unemployment
- 3 EU-Russia relations

Middle East & North Africa Key challenges

- 1 Persistent youth unemployment
- 2 Managing political transitions
- 3 Societal tensions

Asia Key challenges

- 1 Geopolitical tensions
- 2 Structural economic reform
- 3 Managing urbanization

Latin America Key challenges

- 1 Corruption
- 2 Education and skills development
- 3 Increasing inequality

Sub-Saharan Africa Key challenges

- 1 Education and skills development
- 2 Building sustainable governance systems
- 3 Delivering hard infrastructure

Source: Survey on the Global Agenda 2014

Read the report [#Outlook2015](#)



CROWDFUNDING PLATFORMS

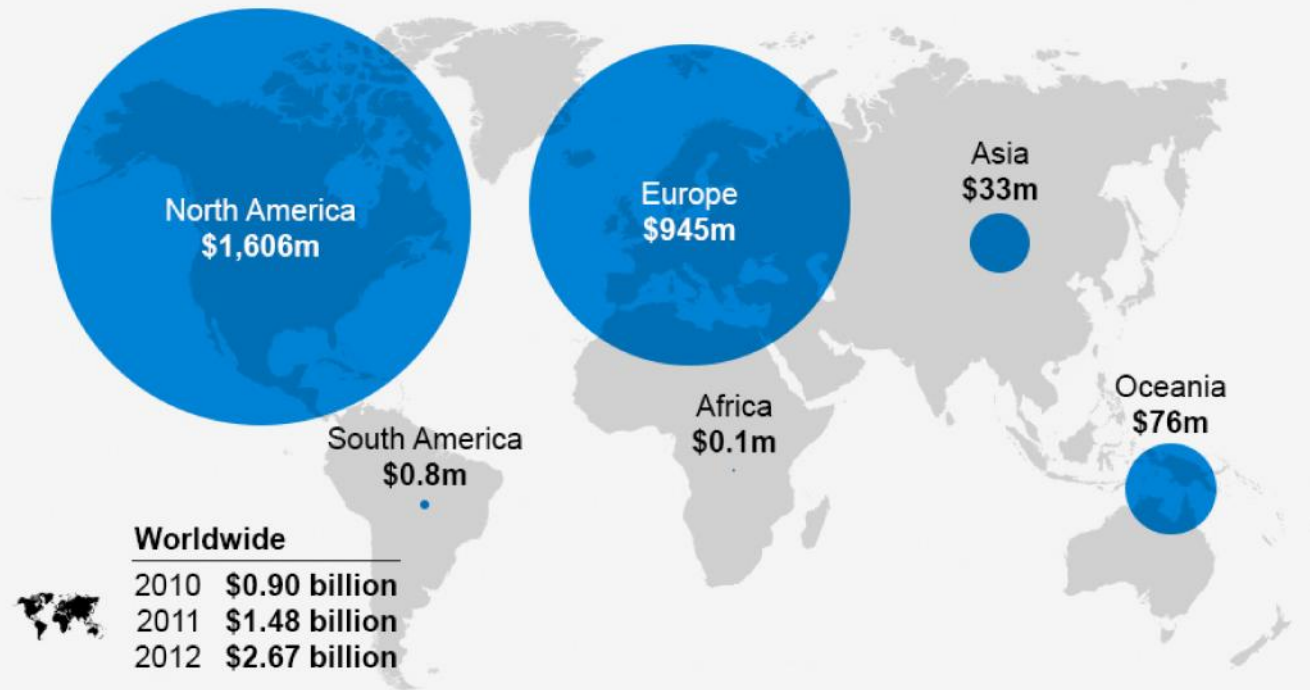
Some facts & figures

Number of crowdfunding platforms in the US	191
Percentage growth of CP worldwide	60%
Worldwide crowdfunding volume	2.8 bn\$ (2012)
Social causes are most active categories	30%
Projects launched on Kickstarter	222,533
Total funds raised of Pebble: e-paper watch	10,266.85K\$
Number of visitors to Crowdcube site in UK	130,184
Source: Statistica, accessed May,8 th , 2015	

CROWDFUNDING : FIGURES

Global Crowdfunding Volume Reaches \$2.7 Billion in 2012

Total funds raised through crowdfunding during 2012 (in million U.S. dollars)



Key statistics: 2014

€2,957 million

Total transaction volume of the online European alternative finance market

144%

Growth of the online European alternative finance market compared with 2013

€620 million

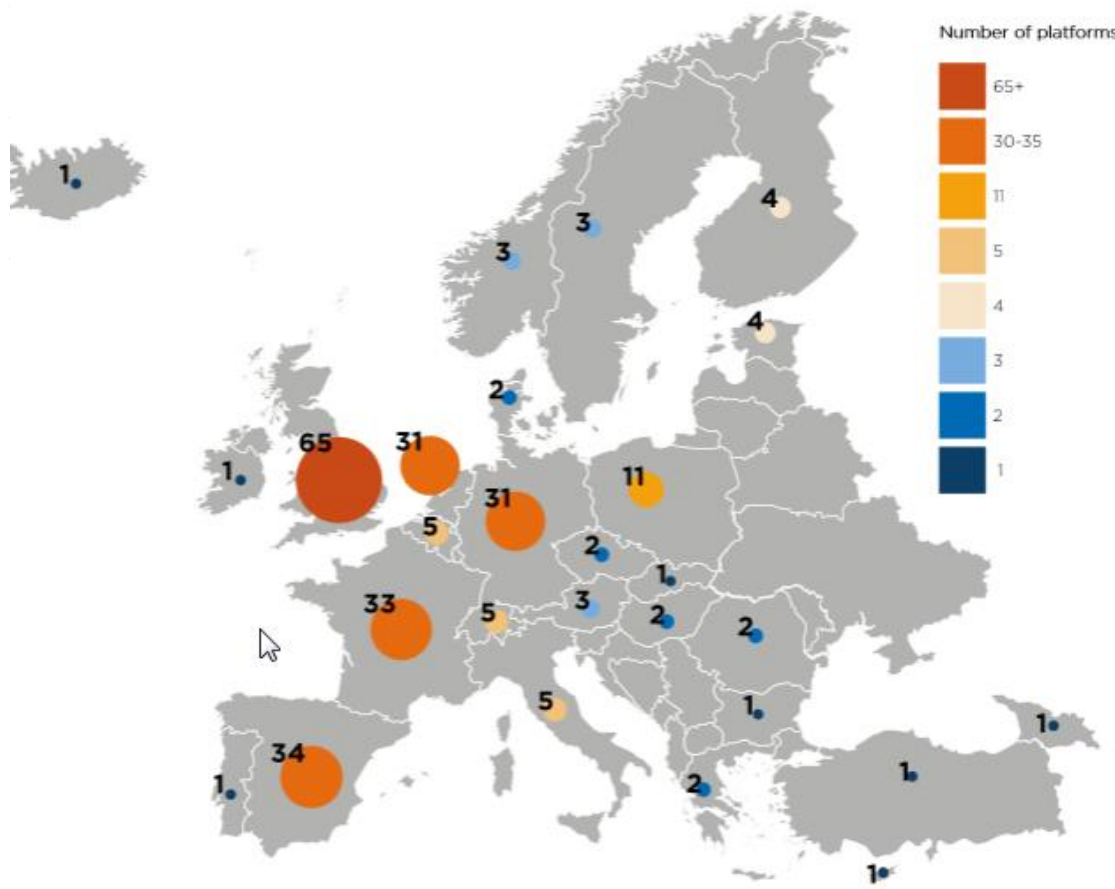
Total transaction volume of the online European alternative finance market excluding the UK

€201 million

Early-stage, growth and working capital funding provided to European start-ups and SMEs through alternative finance platforms

Source: Wardrop et al., (2015) available at http://ec.europa.eu/finance/general-policy/docs/crowdfunding/150304-presentations-ecsf_en.pdf

THE GEOGRAPHICAL DISTRIBUTION OF SURVEYED
ALTERNATIVE FINANCE PLATFORMS IN EUROPE
(BY COUNTRY)



Source: Wardrop et al., (2015)
available at
http://ec.europa.eu/finance/general-policy/docs/crowdfunding/150304-presentations-ecsf_en.pdf

**A WORKING TAXONOMY OF ALTERNATIVE FINANCE,
WITH VALUE OF 2014 EUROPEAN TRANSACTIONS IN €M
(EXCLUDING THE UK)**

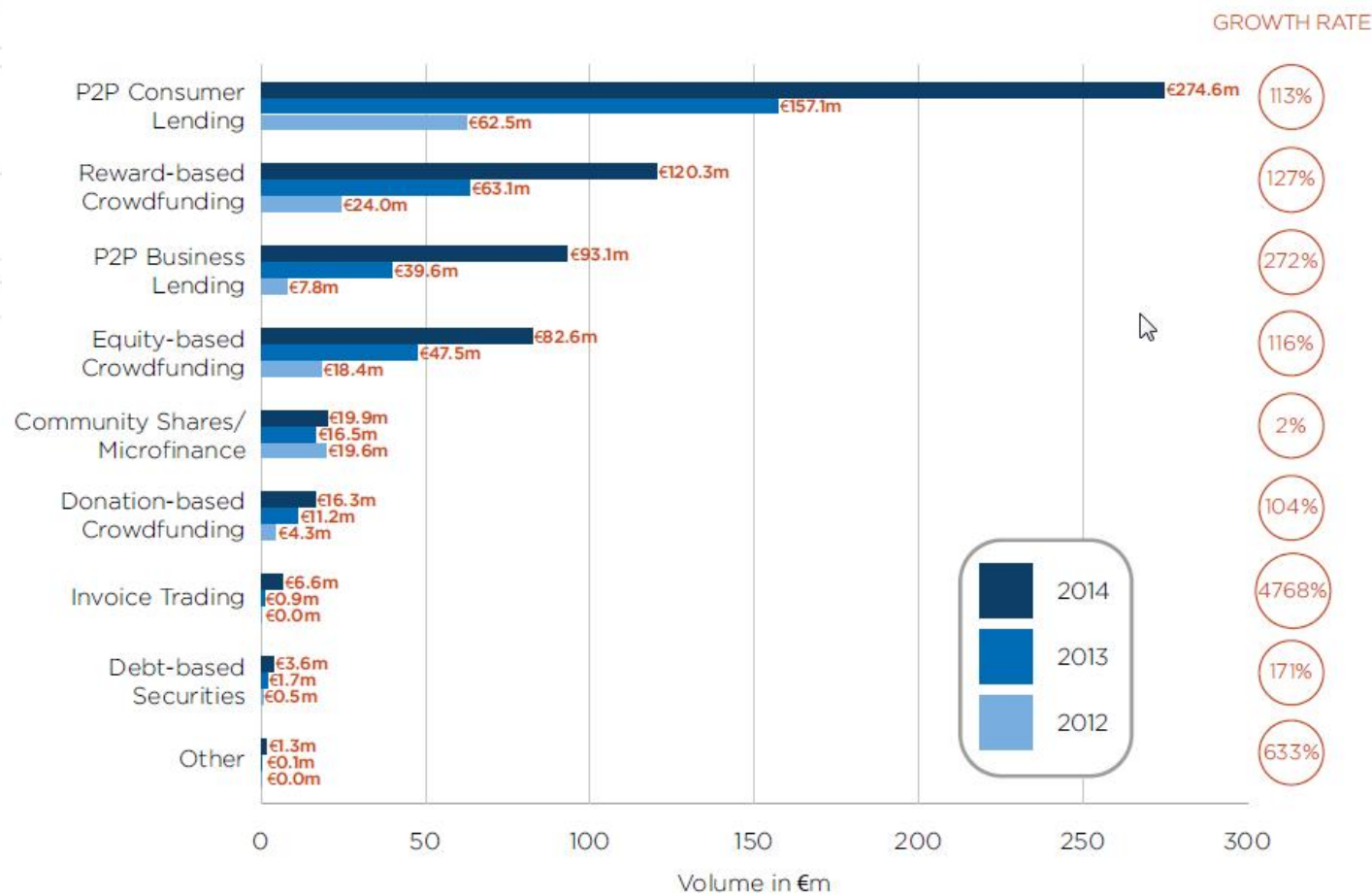


Peer-to-Peer Consumer Lending	Debt-based transactions between individuals; most are unsecured personal loans.	274.62m
Reward-based Crowdfunding	Backers have an expectation that recipients will provide a tangible (but non-financial) reward or product in exchange for their contribution.	120.33m
Peer-to-Peer Business Lending	Debt-based transactions between individual/institutional investors and existing businesses who are mostly SMEs.	93.43m
Equity-based Crowdfunding	Sale of registered security by mostly early-stage firms to investors.	82.56m
Community Shares/ Microfinance	Microfinance refers to the lending of small sums to entrepreneurs who are often economically disadvantaged and financially marginalised. There is a debt obligation incurred, but the amounts lent are very small. Community shares refer to the sale of withdrawable share capital in cooperative and community benefit societies.	19.91m
Donation-based Crowdfunding	No legally binding financial obligation incurred by recipient to donor; no financial or material returns are expected by the donor.	16.34m
Invoice Trading	Firms sell their invoices or receivables to a pool of individual or institutional investors.	6.63m
Debt-based Securities	Lenders receive a non-collateralised debt obligation, typically paid back over an extended period of time. Similar in structure to purchasing a bond, but with different rights and obligations.	3.61m
Pension-led Funding	Mainly allows SME owners/directors to use their accumulated pension funds in order to invest in their own businesses. Intellectual properties are often used as collateral.	N/A

Source: Wardrop et al., (2015) available at http://ec.europa.eu/finance/general-policy/docs/crowdfunding/150304-presentations-ecsf_en.pdf

UNDERLYING AIM: GREED OR RECOGNITION?

ALTERNATIVE FINANCE MODELS IN EUROPE (EXCLUDING THE UK)
VOLUME IN €M AND AVERAGE GROWTH RATE
2012-2014



Source: Wardrop et al., (2015) available at http://ec.europa.eu/finance/general-policy/docs/crowdfunding/1503-04-presentations-ecsf_en.pdf

EXAMPLES IN HEALTH/TECH

- **KITE Patch**

- This innovative and **nontoxic patch keeps mosquitoes at bay** for up to 48 hours, by affixing to clothing and deterring insects that track humans by smelling for carbon dioxide. The idea was the brainchild of a University of California team, and the initiative was jumpstarted by generous support from the Bill and Melinda Gates Foundation and National Institutes of Health. Since **exceeding their funding goal seven times** over, Kite - in partnership with Pilgrim Africa – is now working to distribute the magical patch to Uganda, which is heavily affected by mosquito-borne illnesses.
- Source: Indiegogo.com (<https://www.indiegogo.com/projects/kite-patch>)



EXAMPLES IN HEALTH/TECH

- **FORM1**

- With **3D printable clothing** being a prediction for the future, the need for affordable home printer options needs attention now. Well, researchers from the **MIT Media Lab** have taken on the challenge creating the FORM1, a project to create an affordable, professional 3D printer for the public. The FORM1 blew through its **original \$100,000 goal, getting over 2,000 backers and \$3 million dollars in funding.**



Source: Kickstarter (https://www.kickstarter.com/projects/formlabs/form-1-an-affordable-professional-3d-printer/video_share)

EXAMPLES IN HEALTH/TECH

- Scientific crowdfunding

Using Nanoparticles to Activate Immune Cells to Fight Tumors

Gail A. Bishop | Brett Hanson
University of Iowa

\$1,931
Pledged

128% **\$3,500** **0**
Funded Next Goal Days

Success!

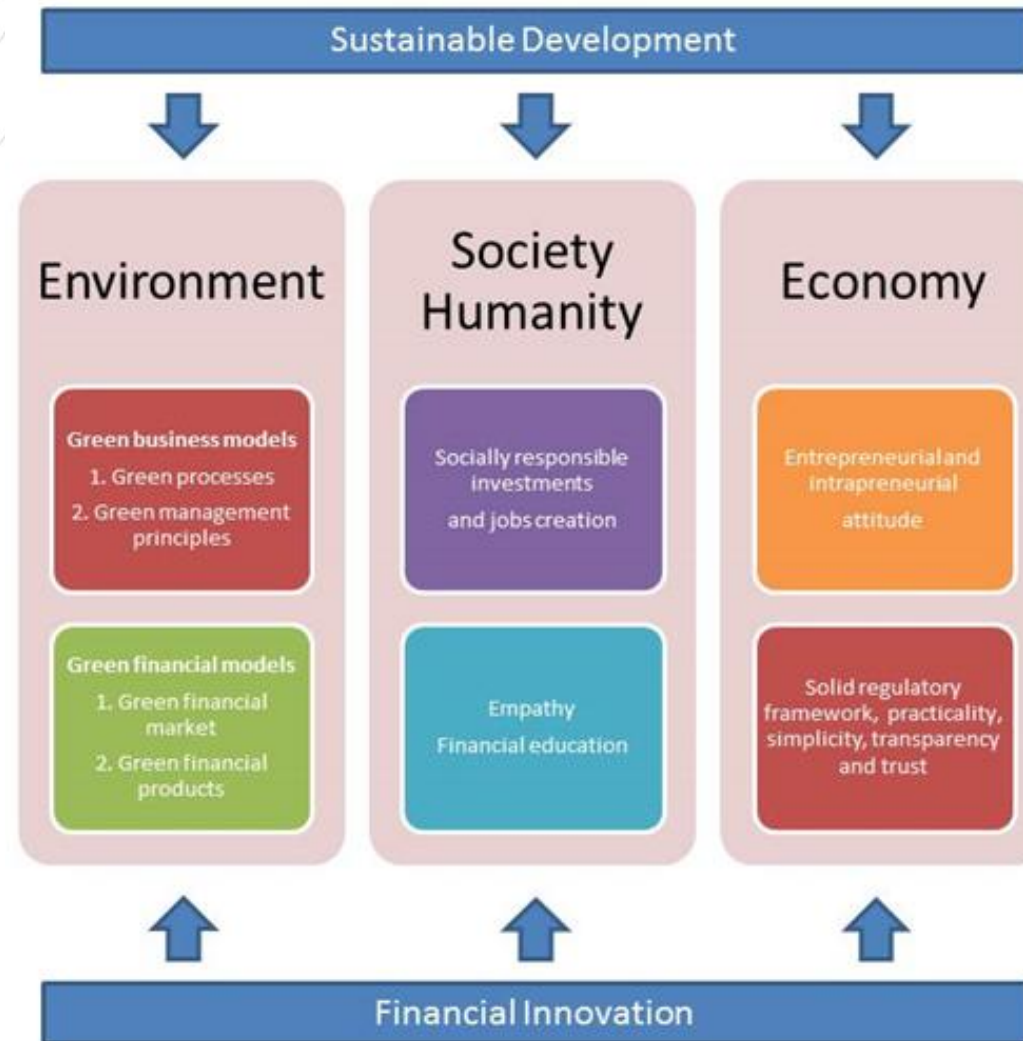
This project was funded on:
19 December 2014

- **Pilot experiment for developing a new cancer treatment** which utilizes the patients own immune system to fight and kill their tumor. Early results are very promising but we want to continue improving our system. By using nanoparticles to stimulate immune cells against tumor targets, we can avoid the potential dangers of directly injecting nanoparticles into patients while harnessing their versatility in antigen and adjuvant delivery

(Source: experiment.com, other platforms are www.petridisch.org and walacea.com)

HUMAN AGENDA

Financial Innovation



Source: Salampasis and Mention, 2013

OPEN QUESTIONS

For debate ...

- Ethical issues of crowdfunding for science purposes
- Regulation needs
- Another form of the FinTech revolution
- Trust and the role of the customer in financial services
- Greediness, recognition or social commitment
- Complement or substitute to Venture Capital ?
- Threat to the business model of incumbents?
- “Too big to fail”: again, a wrong assumption?

**Thank you very much for your kind
attention**



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