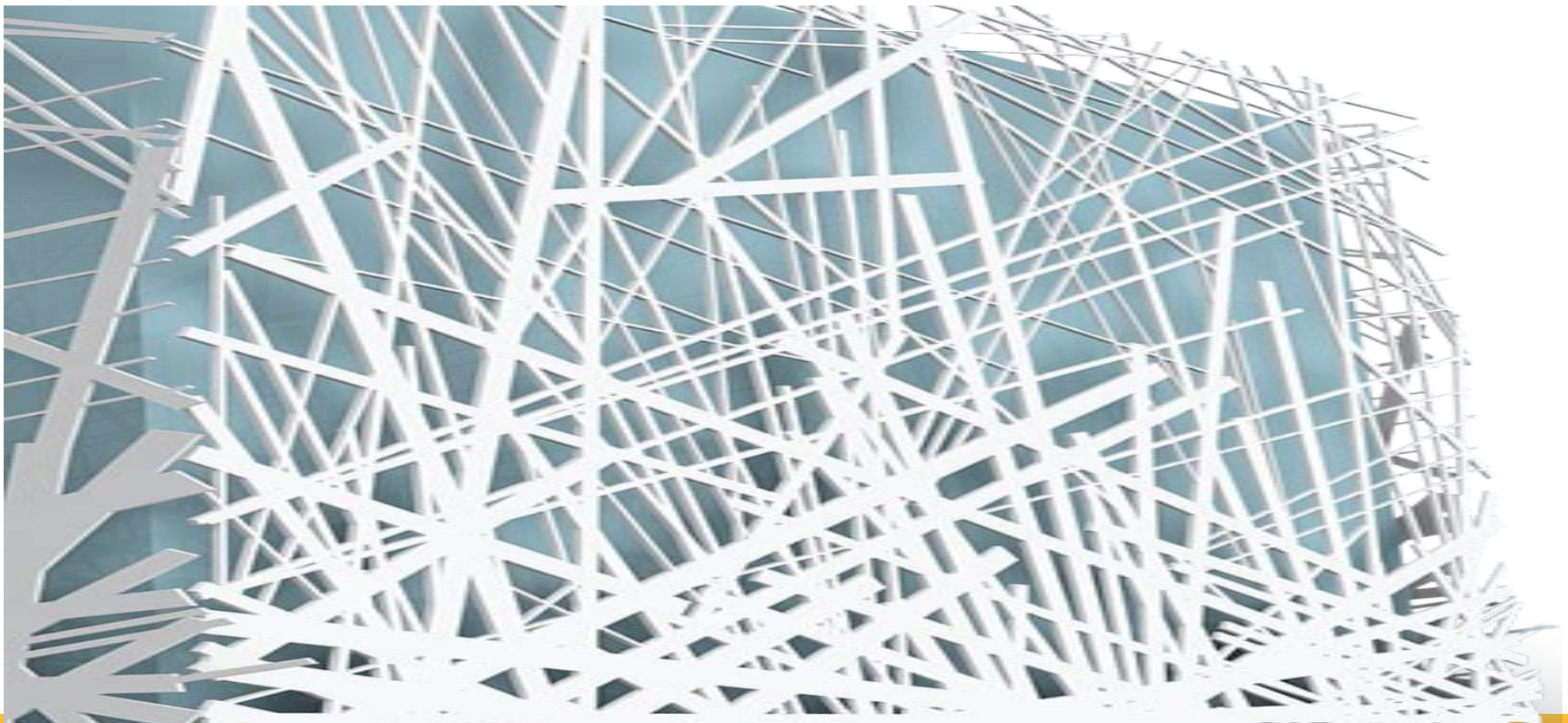


# The importance of cooperating with universities for non conventional intellectual property research

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Tech Transfer Think Tank :4T  
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# Italcementi Group at a glance



**The world's fifth largest cement producer**

**A worldwide presence in 22 countries**

**An overall staff of 18,500 people**

**A consolidated production capacity of approximately 60 million tons**

**2013 annual sales exceeding 4.2 billion Euro**

**The first cement company to be listed on the Italian Stock Exchange**

**Over 150 years-old successful business strategy implemented by a family-driven company at its fifth generation**



# Sustainability as the basis of the Group strategic development



**Industry**



**Innovation**



**Development**



**Sustainability**

# Cements and concretes available on the market...

... are mainly composed of **ordinary products** sold according to demand, compliance with standards or with prescriptions.



Products are undifferentiated  
and are sold with no regard to type of customer  
and to kind of work.

## We decided to change our point of view ...

... by characterizing all products, whether ordinary or special, according to their intended application.



Now, we can sell specific products,  
efficient and effective for a given purpose,  
suitable for well-identified clusters of customers.



# A brand capable of transferring the innovation value to the entire market.

The logo for 'i.nova' features a lowercase 'i' in orange, followed by a period and the word 'nova' in a dark grey, sans-serif font.

- It **summarizes** the entire innovative path of Italcementi, **transferring** it to the global market, in each business sector.
- A **codified, universal and user-friendly** system hinged on the concept of

The word 'performance' is written in a lowercase, sans-serif font. Each letter is a different color: 'p' is black, 'e' is blue, 'r' is red, 'f' is green, 'o' is purple, 'r' is brown, 'm' is dark blue, 'a' is light blue, 'n' is teal, and 'c' is yellow.

The customer is at the centre of a strategy focussing on the ability to offer solutions that can meet special needs.

A simple, consistent and always identifiable system.



# So, we started from the market ...



**Residential**



**Infrastructural**



**Social**



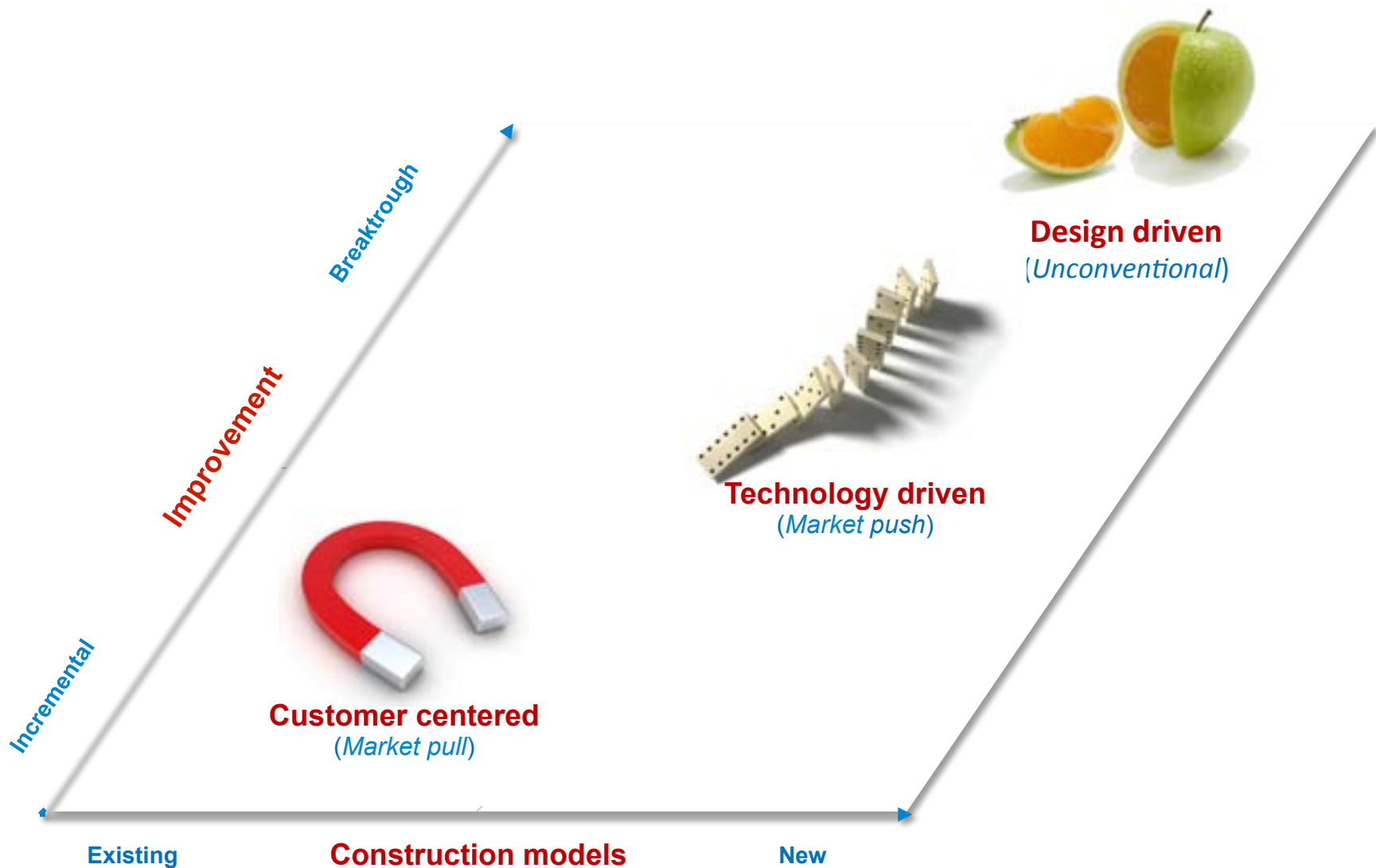
**Industrial**



**“Unconventional”**



# The innovative solutions can be divided in ...



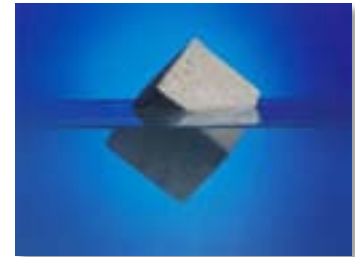
# About “customer centered” solutions ...

- A material suitable for all market segments and for many applications: the **Self Compacting Concrete**



- A sustainable product with a high aesthetic impact: the **drain concrete**

- A fundamental component of the living comfort and of energy saving: the **thermal-acoustic insulating concrete**



- A material for rapid and quality works: the **fluid mixes, also conductive**, for backfilling and for screeds

# ... and “unconventional” products ...

- **i.light**, the “transparent cement”



- **TX Active**, the photocatalytic active principle



- **Effix design**, the ultra-high performance mortar for design elements



# Business Model: example for Unconventional Innovation

## Business Model

### Alternative

1. Vendita (Sede e/o Filiali) dei prodotti
2. Promozione con Partner
3. Cessione know-how a terzi

### Criticità

- organizzazione, responsabilità, competenze
- selezione partner (numero limitato)
- relazione con i partner
- modalità di partecipazione agli utili
- come creare redditività :
  - vendita materiale
  - cementizio
  - fees su fatturato
  - royalties su know-how

- lavorare insieme: “full disclosure”
- contributo proattivo per competenze
- disponibilità ad investire
- accesso del partner alla tecnologia

- produzione c/o terzi poco redditizia

- supporto tecnologico
- vincoli su know-how

Aree da definire

- Strategia
- Scelta modello
- Organizzazione (dedicata / non dedicata, ruoli, risorse..)

# Unconventional Innovation

Using a new approach for the marketing and commercialization of innovative products



- **Unconventional business model**
  - ❖ offer of innovative products and solutions with know-how developed by ITC Group or third parties, which:
    - couldn't normally be produced by ITC Group's facilities
  - and/or*
  - don't fit with the competencies/skills/coverage of our commercial organizations
  - and/or*
  - have a potential market extension exceeding ITC Group perimeter



- - ❖ development of innovative ITC Group products through a network of partners/alliances for production and sales/distribution
  - ❖ R&D - Marketing - Brand policies and Management / Supervision by ITC Group



## R&D Strategies : the Network importance

### 1- *Commodity approach*

Basic Research, Pre-Normative Research  
Incremental Research.

### 2- *Specialty approach*

Unconventional Research, Breakthrough  
Target

# Nanocem Consortium

The mission is to generate basic knowledge on the nano- and micro-scale phenomena that govern the macroscopic performance of cementitious materials, as well as products and structures made from these materials.

Through this fundamental research and knowledge generation, we drive the development of new and improved materials and products that serve the customers' needs, while minimizing the environmental impact of the construction cycle.

## Industrial Partners

- |     |   |     |
|-----|---|-----|
| 1.  | Lafarge Centre de Recherche   | FR  |
| 2.  | Holcim Technology Ltd   | CH  |
| 3.  | CTG-Italcementi Group   | IT  |
| 4.  | HeidelbergCement AG   | DE  |
| 5.  | Aalborg Portland (Cementir Holding)                                   | DK  |
| 6.  | VDZ   | DE  |
| 7.  | SIKA Technology AG  | CH  |
| 8.  | WR Grace  | USA |
| 9.  | BASF  | DE  |
| 10. | SCG Cement-Building Materials, Siam Research and Innovation Co., Ltd. | TH  |
| 11. | TITAN Cement Company  | GR  |

## Academic Partners

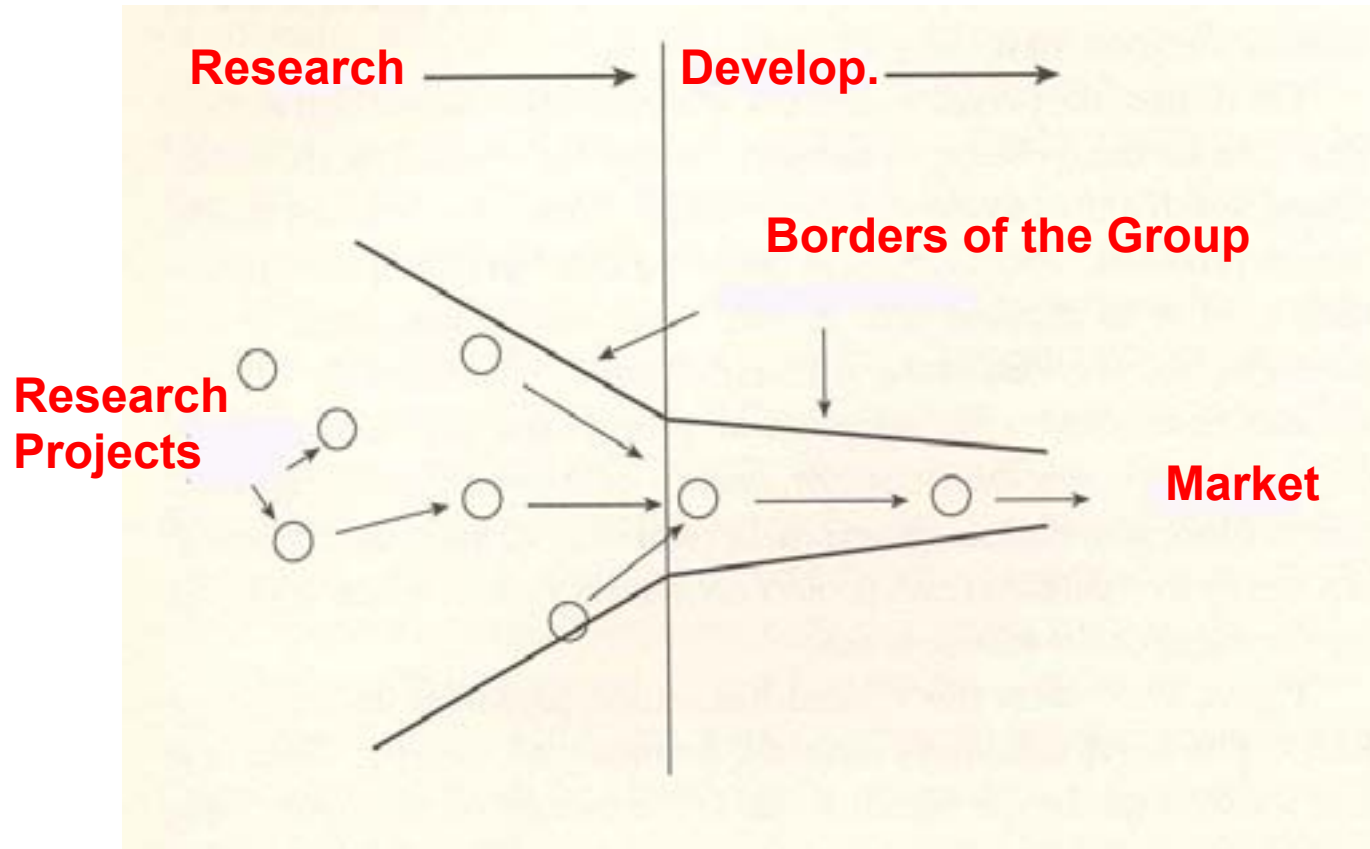
1. Ecole Polytechnique Fédérale de Lausanne
2. Université de Bourgogne
3. University of Aberdeen
4. Agencia Estatal Consejo Superior de Investigaciones Cientificas
5. University of Leeds
6. ZAG
7. Empa, Swiss Federal Laboratories for Materials Science and Technology
8. University of Surrey
9. Technical University of Denmark
10. Lund University
11. University of Aarhus
12. Universitat Politècnica de Catalunya - Barcelona Tech
13. Danish Technological Institute
14. Czech Technical University in Prague
15. Imperial College London
16. Commissariat à l'énergie atomique et aux énergies alternatives
17. CSGI/University of Florence
18. Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux
19. Technische Universität München
20. Norwegian University of Science and Technology (NTNU)
21. Eidgenössische Technische Hochschule Zürich
22. Technische Universität Wien
23. Bauhaus-Universität Weimar
24. University of Sheffield

## Fourth Generation R & D: Managing Knowledge, Technology, and Innovation

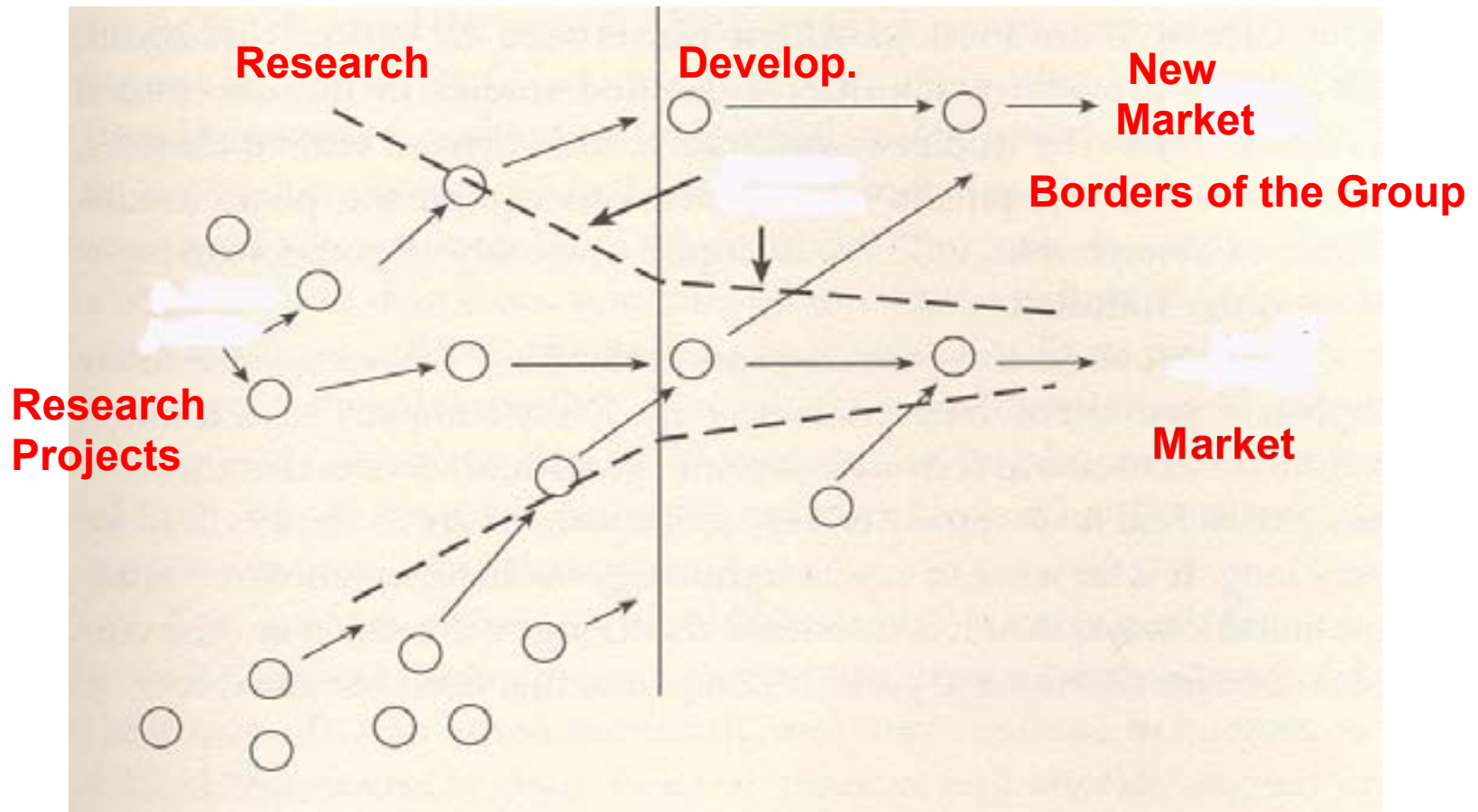
9 Sep 1999 by William L. Miller and Langdon Morris

	Idee	Prove	Convinzione
Partners e clienti			
R&S	<b>1<sup>^</sup> e 2<sup>^</sup> generazione R&amp;S</b>		
Marketing			
Produzione			
	Idee	Prove	Convinzione
Partners e clienti			
R&S	<b>3<sup>^</sup> generazione R&amp;S</b>		
Marketing			
Produzione			
	Idee	Prove	Convinzione
Partners e clienti	<b>4<sup>^</sup> generazione R&amp;S</b>		
R&S			
Marketing			
Produzione			

# Closed Research :Third Generation R&D



# Open Research :Fourth Generation R&D





# Fourth Generation R&D: an example

## COBRA CEMENTITIOUS BRAKE CONTROL

### THE PROJECT

COBRA will demonstrate a completely novel brake pad production technology that will be based on an innovative hydraulic binder composition instead of phenolic resins, at comparable braking performance.

State-of-the-art brake pads are constituted by thermo setting phenolic resins, which are suitable for friction and relatively high contact temperature applications. Moreover reinforcing and filling constituents (about 90% in mass) are incorporated into the polymeric matrix.

Raw materials involved in the innovative hydraulic binder production will allow reducing energy consumption (75-83 MJ/kg phenolic resin compared to 3-9.4 MJ/kg cement) and water consumption (94-282 L/kg phenolic resin compared to 1.7-5.1 L/kg cement).

In addition the novel technology will avoid the emission of aerosols and secondary ultrafine particulate (PM0.1 in particular) generated during braking by traditional phenolic-resin-made pads.

### Partners



# Italcementi collaboration with universities (2014)

- 1 Università di Brescia - Dottorato
- 2 Politecnico di Milano DICA
- 3 Politecnico di Milano D ABC (dottorato)
- 4 Università di Napoli
- 5 Università di Firenze
- 6 Università di Bergamo
- 7 Università di Bergamo (dottorato)
- 8 Università di Bergamo
- 9 TECNALIA
- 10 Università di Bergamo
- 11 Università di Torino
- 12 ITC CNR Milano
- 13 CNR IPCF Bari
- 14 INERIS (FR)
- 15 Università di Bergamo  
Università di Brescia
- 16
- 17 Politecnico di Milano
- 18 Nanocem (Ecole Polytechnique Fédérale de Lausanne)

Agreements with Universities represent about 20% of total CTG R&D costs

# Criticalities with Universities

- When drawing up contracts / agreements
  - 1- Property of results
  - 2- Publication of results
  - 3- Rigid rules for the doctoral agreements
  - 4- Entire process could be speeded up
- Upon execution of the contracts / agreements
  - 1- Strategy to be defined by the industry
  - 2- Time schedule to be set by the industry, anyway tighter than what is usual for the academic world
  - 3- Secrecy of know-how

# i.active: photocatalytic solutions




**i.active** is a performance family comprising all the products based on **TX Active**, the innovative **photocatalytic principle** able to provide **"smog-eating"** and **"self-cleaning"** performance to the entire range of Italcementi Group products

An i.active surface area of 1,000 m<sup>2</sup> is equivalent to

**80**   
planting **80**  
deciduous trees\*

**10**   
removing  
**10 times more**  
pollution than a leaf  
area of 1,000 sqm.

**30**   
eliminating the pollution  
caused by **30 gasoline**  
**vehicles** or 10 diesel  
vehicles

Italcementi has been the first industrial group to patent photocatalytic cementitious materials and to offer an **industrialized solution to the problem of urban pollution**

# i.active BIODYNAMIC: cement for creativity



Biodynamic cement is the innovative solution developed by Italcementi Group for the construction of **Palazzo Italia, the Italian Pavilion at Expo 2015**.

i.design BIODYNAMIC is an innovative mortar with high mechanical strength and fluidity, designed to create thin layer architectural elements.





# Italcementi collaboration with universities for TX Active Project from 1997 on

1	Università di Ferrara	TX ACTIVE CEMENTS
2	Università di Palermo	TX ACTIVE CEMENTS
3	Università di Lecce	TX ACTIVE CEMENTS
4	Università di Roma (La Sapienza)	TX ACTIVE CEMENTS
5	Università di Torino	TX ACTIVE CEMENTS
6	ITC CNR Milano	TX ACTIVE CEMENTS
7	CNR IPCF Bari	TX ACTIVE CEMENTS
8	INERIS (FR)	TX ACTIVE CEMENTS
9	Politecnico di Milano	TX ACTIVE CEMENTS
10	Università di Bergamo	TX ACTIVE CEMENTS

# European Patent Award 2014

TX Active, the active principle contained in the new biodynamic cement that will be used for Italian Pavilion at Expo 2015, has been a finalist in the "Industry" category for the European Inventor Award of the EPO - European Patent Office. The active principle, developed in the Group laboratories by Italcementi research team originally headed by dr. Luigi Cassar, were nominated for what is widely considered the "Oscars of technological innovation" ceremony, which took place on June 17<sup>th</sup> 2014 in Berlin.

