Innovation and Entrepreneurship in Information and Communication Technologies: Towards a Digital Transformation of the Brazilian Society

1 author:

Carlos Henrique Cabral Duarte
Brazilian Institute of Geography and Statistics
58 PUBLICATIONS **431** CITATIONS

Some of the authors of this publication are also working on these related projects:

Object-based compiler development View project

The Influence of Regulatory Requirements on ICT Businesses View project

Innovation and Entrepreneurship in Information and Communication Technologies (ICT): Towards a Digital Transformation of the Brazilian Society

Inovação e Empreendedorismo em Tecnologias da Informação e Comunicação (TICs): Em Direção à Transformação Digital da Sociedade Brasileira

Carlos Henrique C. Duarte
Banco Nacional de Desenvolvimento (BNDES)
Institute of Electric and Electronic Engineers (IEEE), Computer Society
AHK Rio de Janeiro – 08.March.2018

About Carlos Henrique C. Duarte (CHCD)

- <u>Education</u>:
1. PhD (1999), Computer Science, Imperial College, London, UK
2. MSc (1994), Informatics, Pontical Catholic University of Rio de Janeiro, RJ, Brazil;
3. BMath (1992), Mathematics, Federal University of Juiz de Fora, MG, Brazil.

- <u>Professional Experience</u>:
1. Operations Manager, Brazilian Development Bank (BNDES 2003-12);
2. Member of Technical Staff, Brazilian Development Bank (BNDES 1993-);
3. Scientific Programmer, Brazilian Dairy Cattle Research Center (Emprapa, 1989-92).

- <u>Teaching</u>:
1. Lecturer, Computer Science BSc, Estácio de Sá University (2001-2009);
2. Part Time Lecturer, Computer Science MSc, Military Institute of Engineering (1999);
3. Temporary Lecturer, Computer Science BSc, Federal University of Juiz de Fora (1999);
4. Instructor, Database Management, Brazilian Petroleum S.A. (Petrobras, 1992).
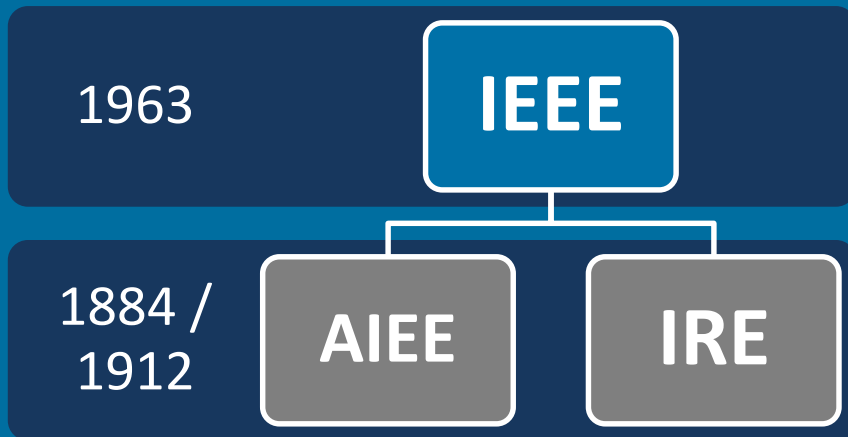
- <u>Reseach</u>:
1. IEEE Senior Member (2012-) and Distinguished Visitor of IEEE Computer Society (2018-20);
2. Research Fellow of Brazilian Research Council (CNPq 2001-3);
3. Author, editor and reviewer of many papers.

Origins, Structure and Mission

The IEEE was founded in 1963 as an association of engineers.

Conjoined Structure

1963	**IEEE**
1884 / 1912	**AIEE** **IRE**

MISSION

Foster technological innovation and excellence for the benefit of humanity.

VISION

To be essential to the global technical community and to professionals everywhere, universally recognized for the contributions of technology and of technical professionals in improving global conditions..

VALUES

Trust, Growth and Nurturing, Global Community Building, Partnership, Service to Humanity and Integrity in Action.

A Continued IEEE Computer Society Membership

Computer Society

An organization with 60.000 members, in 168 countries, organized in 480 chapters and 40 technical communities, managed by volunteer members.
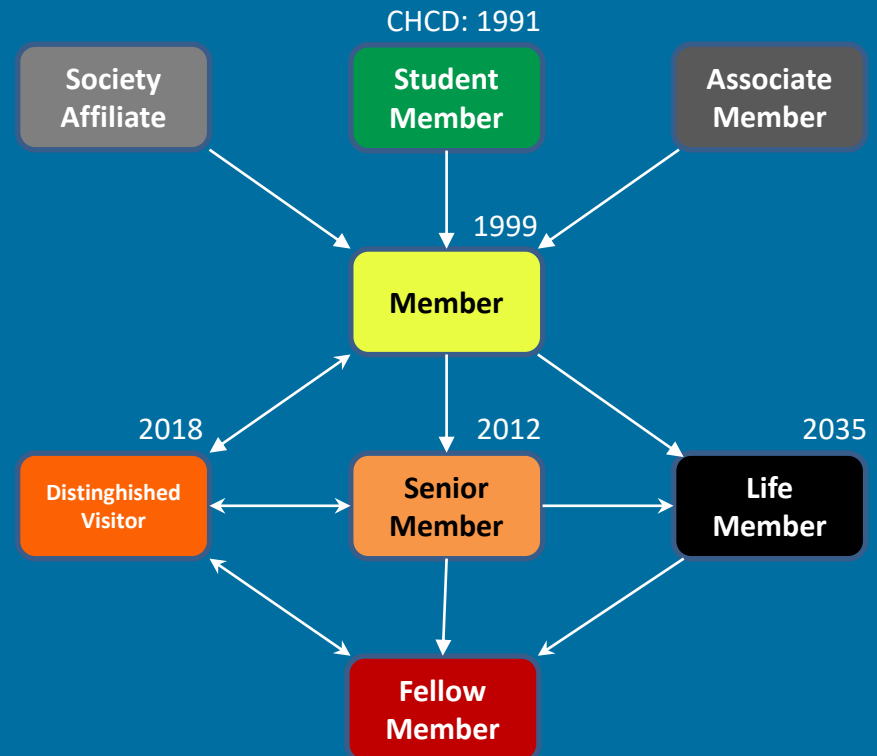
1)   Technical Activities:
❑   Standards - Examples are:
       IEEE 802.3 - Ehternet (1983);
       IEEE 1076 - VHDL (1987);
       IEEE 802.11 - Wi-Fi (1997);
       IoT (work in progress);
❑   Publications: 21 journals, 13 magazines;
➤   CHCD: In IEEE Software magazine;

2)   Community Service:
❑   Education: IEEE.TV, Rock Stars, SkillChoice;
❑   Conferences: Sponsors at least 200 per year;
➤   CHCD: PC Member of IEEE Req. Eng. Conf.
❑   Editorial process: Requires peer reviewing;
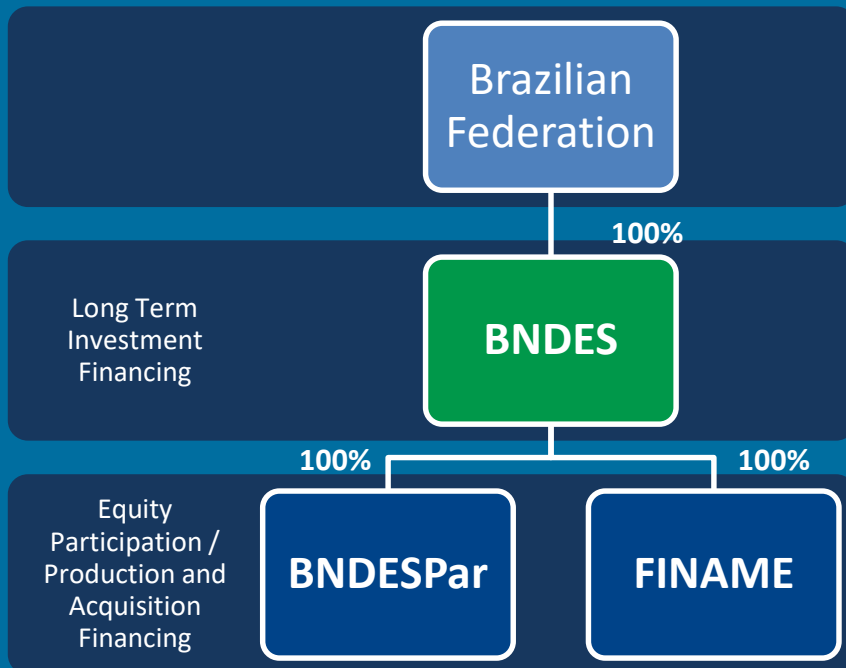➤   CHCD: Reviewed for IEEE Software;

3)   Membership Development:

CHCD: 1991

Society Affiliate — Student Member — Associate Member

1999

Member

2018 — Distinghished Visitor

2012 — Senior Member

2035 — Life Member

Fellow Member

BNDES

Origins, Structure and Mission

BNDES was founded in 1952 as a company under private law.

Structure

```
              Brazilian
              Federation
                  |
                100%
                  |
Long Term        BNDES
Investment
Financing
              100% ── ── 100%
Equity          |          |
Participation / BNDESPar  FINAME
Production and
Acquisition
Financing
```

MISSION

To foster sustainable and competitive development of the Brazilian economy, generating employment, while reducing social and regional inequalities.

VISION

To be the development bank of Brazil, innovative, outstanding, and to proactively tackle the current and relevant challenges of our society.
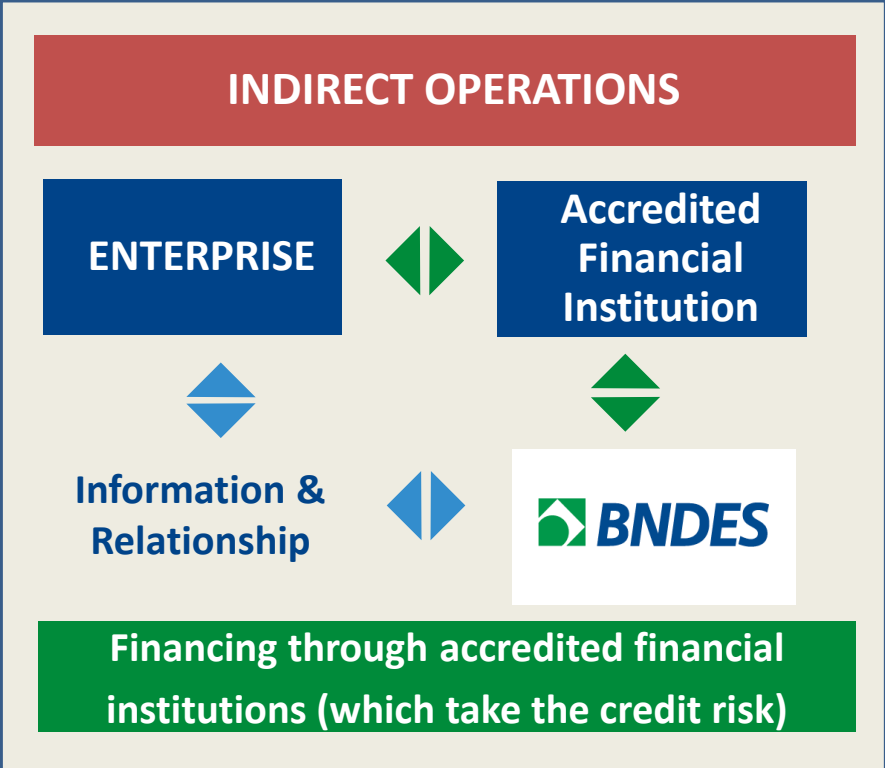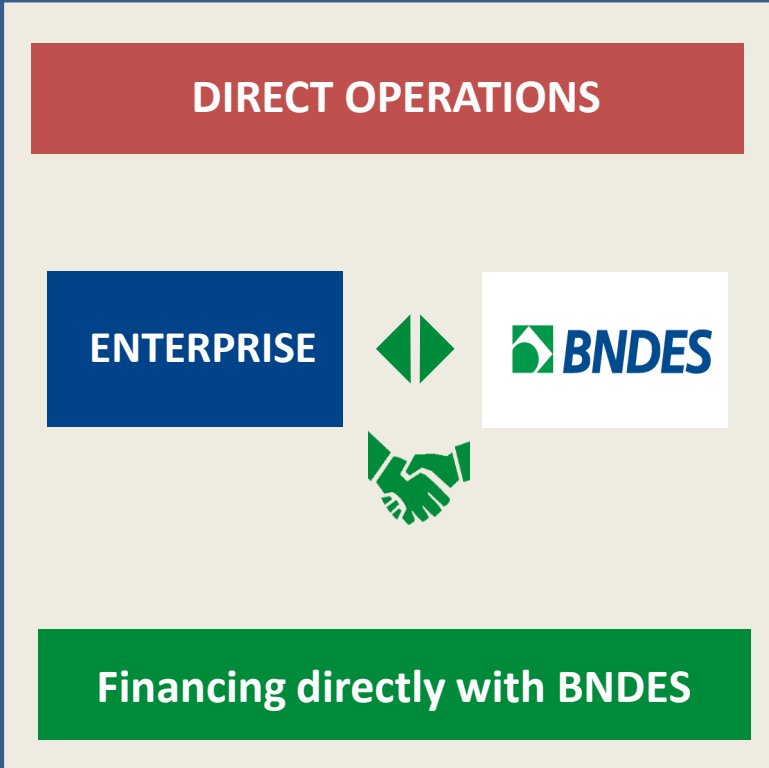
VALUES

Commitment to the Brazilian development, ethics, public spirit and excellence.

A Lifelong Career at BNDES

- Managed the funding of more than 50 ITC companies, using credit and venture capital instruments, between 2003 and 2012. Advised two of those until they were listed in the Bovespa Stock Market (ERP software providers);
- Responsible for the funding of nearly 10 ICT R&D organizations to develop innovation and ecosystem establishment projects;
- Represented BNDES in the Brazilian National Information Technology Committee (CATI, 2003-2012);
- Represented BNDES in the Board of the Society for the Promotion of Brazilian Software Excellence (Softex Society, 2003-2012);
- Co-organized the 1st Int. Seminar on the Promotion of Innovation and Intellectual Property in Information Technology (2008, Brazil);
- Biography published in Marquis Who is Who in the World in 2007 due to contributions to the Brazilian software industry;

How BNDES Works

BNDES ICT Innovation Ecosystem Financing

BNDES ICT Innovation Ecosystem Financing

TecnoPUC– Porto Alegre, RS (Indirect)

SENAI CIMATEC – Salvador, BA (Direct)

Partec – São Leopoldo, RS (Direct)
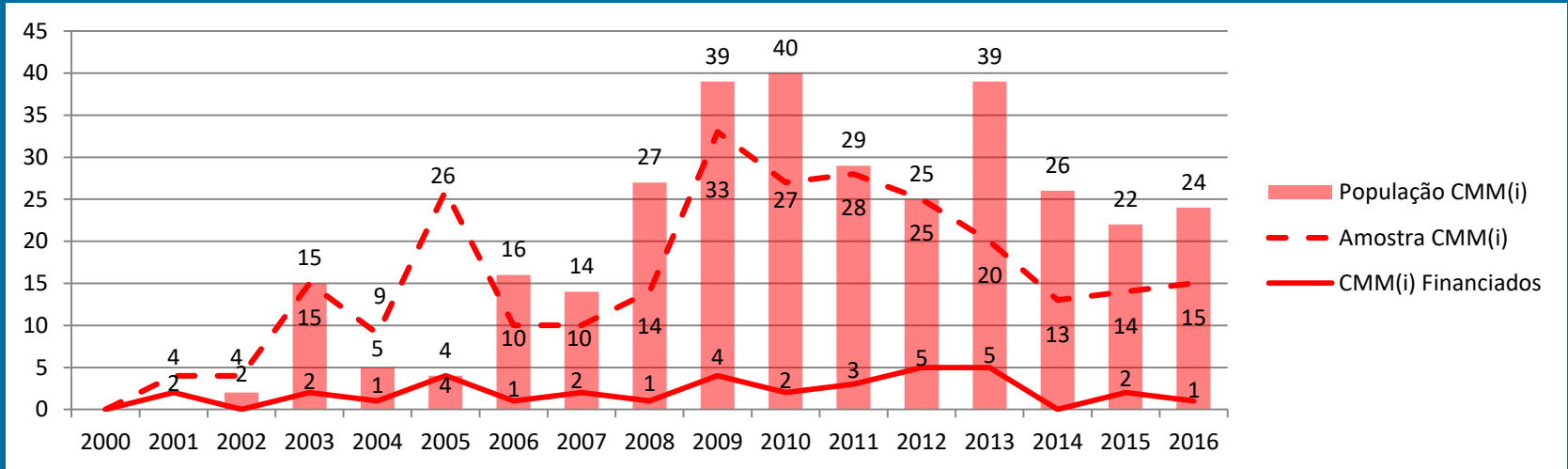

Instituto Eldorado – Campinas, SP (Mixed)

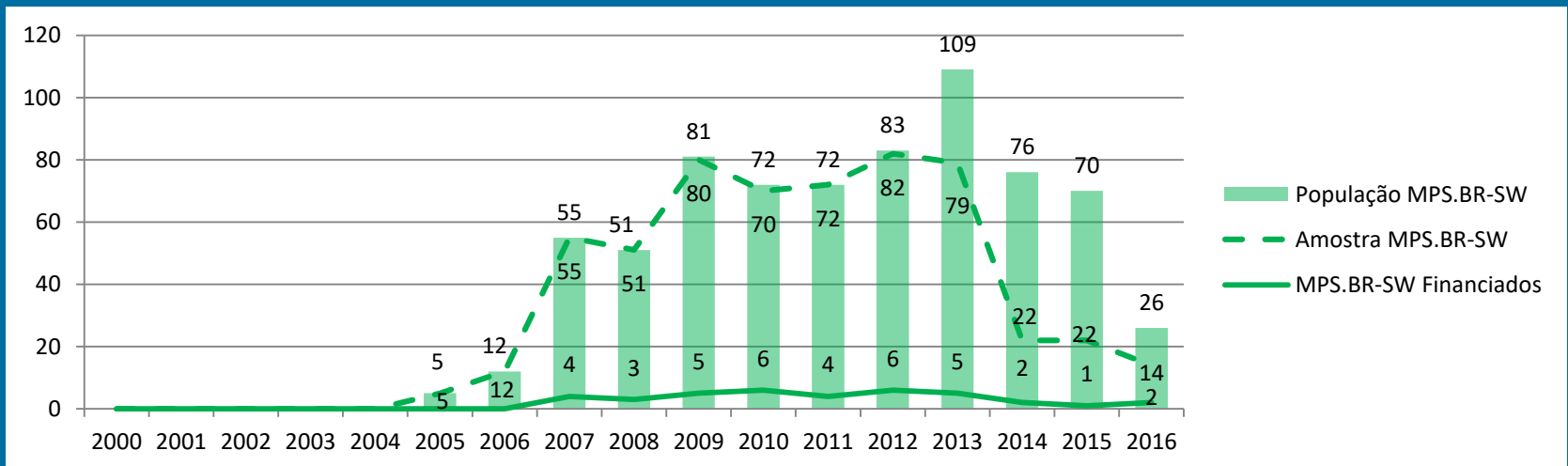**Embrapii Units, similar to Fraunhofer Institutes ↑**

BNDES IC Technology Financing

SPIM Appraisals/Implementations using Cartão BNDES

Funding to CMM(i) appraisals/implementations by SMSEs

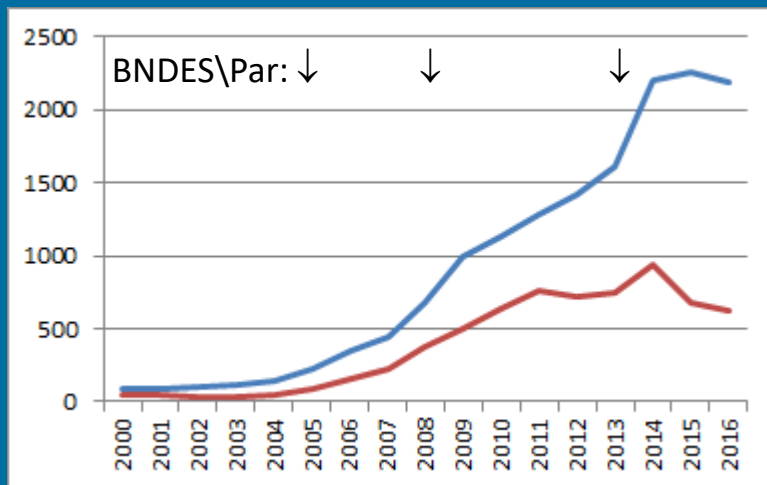### Funding to MPS.BR-SW appraisals/implementations by SMSEs

BNDES ICT Entrepreneurship Financing

Totvs

- Founded in 1983 by Ernesto Haberkorn and Laércio Cosentino;
- Provides vertical Enterprise Resource Planning software (and IA tools);
- IPO in BOVESPA stock market happened in 2006 (TOTS3) via primary and secondary placements (BPar has 4,3%);
- Has 50% of ERP market share (BR);

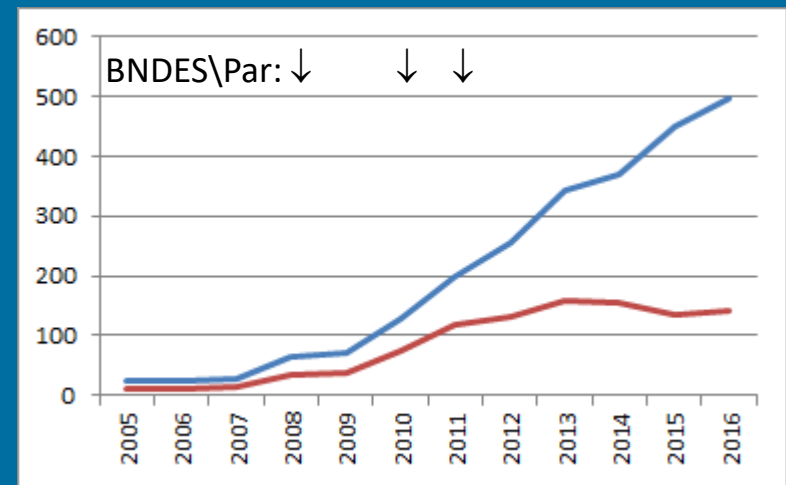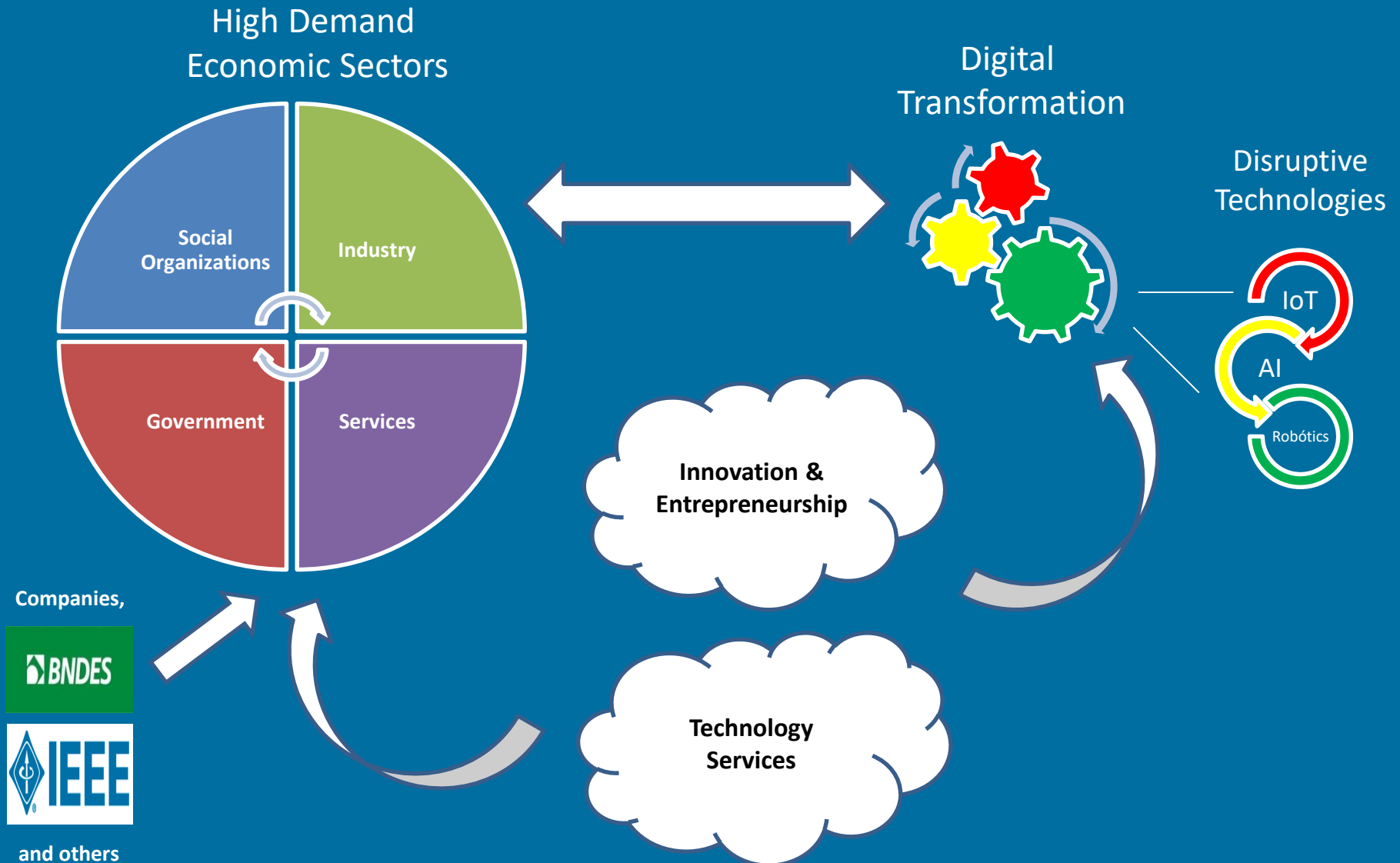## Linx

- Founded in 1985 by Alberto Menasce, Nércio Fernandes and others;
- Provides Enterprise Resource Planning software for retail and correlated sectors (and Omnichannel tools);
- IPO in BOVESPA stock market happened in 2013 (LINX3) via primary and secondary placements (Bpar has 5,8%);

Totvs – Net Revenue (R$ and US$ million)

Acquisitions: 1   1 1 4 2   4 6   7 1 2

Linx – Net Revenue (R$ and US$ million)

Acquisitions: 1   3   2   3   2 6   3   2   1

Towards Digital Transformation in Brazil

High Demand Economic Sectors

Social Organizations

Industry

Government

Services

Digital Transformation

Disruptive Technologies

IoT

AI

Robótics

Innovation & Entrepreneurship

Technology Services

Companies,

BNDES

IEEE

and others

* BNDES is currently studying IoT and cryptocurrencies, as well as conducting a public consultation on fintech actions.

Bibliographic References

1. Carlos Henrique C. Duarte. Patterns of Cooperative Technology Development and Transfer for Software-Engineering-in-The-Large. In *Proc. 2nd Int. Workshop on Software Engineering Research and Industrial Practice (SER&IP 2015)*. pages 32-38.
2. Carlos Henrique C. Duarte. Productivity Paradoxes Revisited: Assessing the Relationship Between Quality Maturity Levels and Labor Productivity in Brazilian Software Companies. *Empirical Software Engineering* 22(2):818-847. April 2017.
3. Carlos Henrique C. Duarte. The Influence of Tax Incentive and Market Regulation Requirements on IT Companies: Empirical Evidence from the Brazilian Industry. Int. Workshop on Requirements Engineering and Law (RELAW 2016). *RE 2016 Workshop Proceedings*. pages 239-248.
4. Carlos Henrique C. Duarte, Brazil: Cooperative Development of a Software Industry. *IEEE Software* 19(3):84-87. May 2002.
5. Christof Ebert and Carlos Henrique C. Duarte. Requirements Engineering for the Digital Transformation: An Industry Panel. In P*roc. 24th IEEE International Requirements Engineering Conference (RE 2016)*. pages 4-5. September 2016.

Obs: The photos in this presentation were obtained in the Internet.

Innovation and Entrepreneurship in Information and Communication Technologies (ICT): Towards a Digital Transformation of the Brazilian Society

Thank You!

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br.linkedin.com/in/carlos-henrique-duarte-613a0943

cduarte@bndes.gov.br
carlos.duarte@computer.org

* The assumptions, views and opinions in this paper are solely those of the author and do not necessarily reflect the official policy, strategy or position of any Brazilian government entity.