Demystifying the World of ICT Standardisation: An Insiders Viewpoint

Prof. Rory V. O’Connor
Dublin City University, Ireland
Lero, The Irish Software Engineering Research Centre

About me

From: Dublin City University, Ireland

My research interests...
Software Engineering
Software Project and Process Management
Support software development, technical, human, social, etc.
Standards to support all aspects of software development
Who am I?

- **Professor of Computing**, School of Computing, Dublin City University, Ireland
- **Head of School**, School of Computing, Dublin City University, Ireland
- **Senior Researcher** Lero, The Irish Software Research Centre

- **Head of Delegation (Ireland)** to the International Organization for Standardization (ISO/IEC JTC1/SC7), which manages Software & Systems Engineering standards
- **Convenor** Ireland mirror committee of ISO/IEC JTC1/SC7
- **Member** NSAI’s ICT Standards Consultative Committee
- **Member** of the ISO/IEC JTC1/SC7/ Working Group 24 on Lifecycle Profiles for VSE (Very Small Enterprises)
- **Member** of the ISO/IEC JTC1/SC40 Govername of IT
- **Editor**, ISO/IEC 29110-2:2011 Software engineering lifecycle profiles

www.roryoconnor.com

What am I here to talk about?

STANDARDS

© Rory V. O’Connor
www.RoryOConnor.com
Keep an open mind

Standards: The “Sales Pitch”
We live in an amazing world full of incredible opportunities and endless possibilities.

But it can also be a complex place, with many challenges facing our environment, economy and society...
When things don't work as they should it often means that standards are absent.

But when standards are applied, life is just so much richer.
The arguments for...

- **Standards** help to make the world a **safer**, cleaner and more efficient place: from food safety to computers, from health care to new technologies.
- Standards can make a positive difference to all our lives, utilizing a wealth of **international experience** and **wisdom**.
- In today's ever changing, world standards help create growth, open up global markets and make trade fairer, including for developing countries.
- Standards can help tackle global challenges like climate change, road safety, energy and social responsibility.
- Standards builds **confidence**: today, tomorrow and the future.

Standards are everywhere

ISO 8124-1:2000
Safety aspects relating to mechanical and physical properties of children’s toys
Standards are everywhere

ISO 3873:1977
Industrial safety helmets

ISO 4849:1981
Personal eye-protectors

EN 471:2003
High visibility clothing

Standards are everywhere

ISO/IEC 9995
Keyboard layout

ISO 9241-11:1998
Ergonomic requirements for office work
Standards are everywhere

**ISO 3901**
The International Standard Recording Code (ISRC)

**ISO/IEC-11172-3**
MPEG and MP3 digital audio and video

Standards are everywhere

**ISO/IEC 18004:2006**
Information technology - Automatic identification and data capture techniques - QR code 2005 bar code symbology specification
Finally, some standards are just vital for life as know it!

I.S. 417 Irish Coffee
To ensure the integrity of the ingredients of Irish Coffee, NSAI, Ireland’s national standards body published an Irish Standard, I.S. 417 Irish Coffee in 1988.

Panacea
A solution or remedy for all difficulties
The truth about standards
The truth about standards

- Misconceptions sometimes shed a false light on standards and myths begin to develop.
- Myths about standards are scare stories based on hearsay, rumors and half-truths, many of which have been repeated so often that they have become accepted truths within the public and media consciousness.
- By debunking particular ‘standards myths’ we can reflect some positivity back onto standardization.
  - Standards are only relevant to large, established business...
  - Standards are only applicable to products...
  - Finding the most appropriate standard will be difficult...
  - I can’t have a say in drafting standards...
  - Buying a standard is expensive...
  - Introducing a standard will take up a lot of time, effort and costs...
  - Standards inhibit innovation...
  - We don’t need standards – we already have the best solution...

Let’s examine standards and the real truth behind them
My Research into process & Standards Adoption

- Multiple longitudinal studies into software product companies aimed at:
  - Understanding process formation
  - Process evolution
  - Adoption (or lack) of standards
Results in a nutshell

- Manager perceived the **Cost of Process Standards** as main barrier

![Diagram showing Cost of Process Standards and related factors]

What happened the companies?

![Image of a road sign pointing to Success and Failure with a 'Bang Head Here' sign]

© Rory V. O’Connor
www.RoryOConnor.com
Let’s look at IT failure

Can standards help?

Hard truth

• 75% of VC-backed startups fail
  – There appear to be a lot more failures going on than we ever learn about.
  – Research indicates that as many as 75 percent of venture-backed companies never return cash to investors
  – With 30 to 40 percent of those liquidating assets where investors lose all of their money.

Source: Prof. Shikhar Ghosh, Harvard Business School
Great Quote

“Venture capitalists bury their dead very quietly”

Deborah Gage, Wall Street Journal
September 19, 2012

Top 1 of 10 Reasons Why VC-Backed Companies Fail

• Not learning from your mistakes.
  – I think God is a benevolent man (or woman).
  – He wants us to be successful.
  – Before we make any “blow-the-company-to-smithereens” decisions, I find he usually gives us a couple of warnings that this probably is a bad idea.
  – However, most of the time, we ignore these.
  – We pump ourselves (and our employees) up with positive self-talk (“I will not make that same mistake again; I will do better next time…”).
  – If we only did a better job at fully grasping why we previously were unsuccessful, we could adequately insulate ourselves from future repeat stumbles.

Source: Eric Jackson, Forbes Magazine, December 2012
In the Beginning...

Software projects start with optimism, and sometimes even wild enthusiasm

At the End...

• But too many software projects still end is disaster
The Blame Game

• Many problems are related to management practices

About Icebergs

One could imagine that the passengers standing on the deck of Titanic might have admired the icebergs they saw as exotic phenomena. You would also think that most of them probably had no concept of the anatomy of an iceberg.
Software Products

We do not pay enough attention to what lies beneath the surface

Projects

We do not pay enough attention to what lies beneath the surface
Our Challenge

• Change perspective and understanding
• As a Community we are still challenged with the task to, in a pedagogic way, create enough understanding for our work
• So we may have the time and resources that we need in order to deliver the quality in the software that the customer expects
• That is, we need to convey that it is not only the surface (tip of the Iceberg) that matters
• **Highlighting the role of standards in our process can help give visibility**

The software management puzzle
We don’t work this way

• All together, looking at one computer, one program, discussing every requirement, every line of code, every decision made.
This can lead to problems like:

- Different interpretations of requirements with no way to discuss it
- Errors in the code being developed
- Disconnects when we try to integrate the software
- And a ripple effect of other problems as the program is developed and used

How to address these problems

- One way to tackle these potential problems is through use of a **standardised methodology** that provides organisation-wide understanding of:
  - Language
  - Need for plans, databases, documentation, etc.
  - Who is responsible for what, when
- A next logical step is to look at not only an organisation-wide methodology, but one that is understood and adopted by others.
Why Standards?

International standards have become, at the same time, the price of admission to the global economy and the glue holding it together. Adherence to the standards is a condition of entry to the World Trade Organization. And as the global economy grows, so do they.

Daniel Altman
Business writer and commentator
The Economist, The International Herald Tribune, and The New York Times

Standards uncovered

• Perception
  – Standards take too much of your time away from the ‘real’ work.

• Reality
  – When the new way has become the way, the only way, work should be more efficient, with less fire fighting and fewer bugs.
  – The new way has to be considered as part of the ‘real’ work, not an addition to it.
Standards uncovered

• Perception
  – Creativity is lost with too much ‘red tape’
    • If by creativity you mean developing new requirements as you develop code, we hope so.
    • If by creativity you mean having to develop new methods of doing everything every time, by all means.

• Reality
  – Standards provide the framework within which you can be creative where it counts.

The Cure?

Is having a Quality Standardized [software/systems] Process the cure for everything?
HOW TO Toss A VIKING BASH

THE PLAN

THERE WILL BE A RECEPTION LINE OUTSIDE ... IN HERE WILL BE A COLD BUFFET ... YOU WILL BE IN THE DRUNK CHAMBER ... YOUR LEADERS WILL BE AT THE BIG TABLE AND OTHERS AT THE SMALL TABLES ... AND WILL BE THERE waiting For you ...

THE REALITY

© Rory V. O’Connor
www.RoryOConnor.com
Use common sense when implementing standards

My Central Message to you...
Get Involved
Why get involved in standards development?

• One of the strengths of standards is that they are created by the people that need them.
• Industry / academic experts drive all aspects of the standard development process, from deciding whether a new standard is needed to defining all the technical content.
• Getting involved in this process can bring significant advantages to your and your business.

Views from industry

Taking part in standardization work allows our company to have access to standardization developments.

We are in a time of strong international growth and this participation will allow us to adapt our products to future international regulations.

Julio Gomez
CEO, Avanzare
Spain
Who develops standards?

- When it comes to developing standards, you’re either at the table... or you’re on the menu.
Is your voice heard?

• When it comes to developing standards, you’re either at the table... or you’re on the menu
  – Influence the standards that affect you
  – Be recognized for your contributions
  – Connect with potential customers and suppliers, research partners

Is your voice heard?

• Don’t develop your standards at the kids table
Is your voice heard?

• Don’t develop your standards at the kids table
  – Accredited, internationally recognized
  – Proven track record
  – Rules that protect a level playing field

Who is the ISO?

• International Organization for Standardization is the world's largest developer of International Standards
• ISO is a non-governmental network of the national standards institutes of 162 countries, one member per country
• This enables ISO to reach a consensus on solutions that meet both the requirements of business and society
• One country = one vote
ISO/IEC Domains covered in ICT

- Project Management
- Industrial Engineering
- Quality Management (ISO TC 176)
- Dependability Engineering (IEC TC 56)
- Safety (IEC TC 65), Security, other mission-critical
- Computer Sciences and Engineering
- Application Domains (many TCs)

Who develops ISO standards?

- ISO standards are developed by groups of experts, within technical committees (TCs).
- TCs are made up of representatives of industry, NGOs, governments, Universities and other stakeholders, who are put forward by ISO’s members.
- ISO has over 250 technical committees.
- People like you and me!!!
My “Standards” Work

• Standards development
• Teaching standards
• Research in standardization

My standards engagement

• Standards Bodies
  – Mainly ISO

• Nature of engagement
  – SC7 convenor of mirror comittee
  – Editor/contributor ISO/IEC 29110 (VSE), ISO/IEC 15504 (SPICE), ISO/IEC 12207, IEC 62304 and more...

• Areas
  – Software process, process assessment, certification, software quality, software testing, governance, cloud computing

• Industry sectors
  – Software development in general and medical device software development
What I actually do?

- Attend International ISO meetings (2+ times per year)
- Participate in discussion groups
- Contribute to standards development
- Edit standards documents
- Keep a watching eye on a range of software engineering standards
- Brief / advise NSAI (Irish National Body)
- Keep interested parties informed
- Talk at event like this
- And lots more…

Standards meeting can be fun… really!

© Rory V. O’Connor
www.RoryOConnor.com
ISO
International Sightseeing Organization

Standards assist my research
Standardization research as route to publishing

Access to experts
To conclude

Hallmarks of Our Industry

• It's an unfortunate truth that our most projects are:
  – Late: deadlines are usually missed
  – Over budget: cost more than planned
  – Not fully functional: don’t have all the promised features and functionalities
  – Defective: deployed with defects and need heavy re-work to remove them.

• We do the same thing over and over again, and expect different results.

• Do you still feel that we should consider standards as a path to improvement?
Your Options!

Continue with the software industry’s historical record

OR

Transform your business into an efficient and mature organization with higher profits using standards

Get Involved

There’s a place for you!
How do I get involved?

- Talk to your national standards body and/or national delegates (i.e., people like me)

[Logo of Polish Committee for Standardization (PKN)]

www.RoryOConnor.com

[Logo of LERO and DCU]

www.RoryOConnor.com
Shameless promotion

Computer Standards & Interfaces

The International Journal on the Development and Application of Standards for Computers, Software Quality, Data Communications, Interfaces and Measurement

Editor-in-Chief: Rory O'Connor

http://www.journals.elsevier.com/computer-standards-and-interfaces/