

Creative Thinking and Innovation in Technology Foresight

Dr. Sandra M. Dingli
The Edward de Bono Institute
University of Malta
instituteofthinking@um.edu.mt

A glance towards the future ...

“In the future, instead of striving to be right at a high cost, it will be more appropriate to be flexible and plural at a lower cost.

If you cannot accurately predict the future then you must flexibly be prepared to deal with various possible futures.” (Edward de Bono)

“What enables the wise sovereign and the good general to ... achieve things beyond the reach of ordinary men is foreknowledge.”
(Sun Tzu)

Creative Thinking, Innovation, Entrepreneurship and Foresight ...

All four are interlinked
and all four play
an increasingly important role
in our lives today
...mainly due to the increasing rate
of social and technological change

The EU's Lisbon Agenda: Towards economic prosperity through...

- ❑ the cultivation of a climate to provide investors with a more attractive place to invest, innovate and work
- ❑ the generation of concrete incentives to achieve an adequate research and innovation environment
- ❑ the design and implementation of research and innovation policies as key priorities
- ❑ emphasis on the importance of competition, globalisation, employment and entrepreneurship
- ❑ an accentuation of the synergy that can be achieved through information sharing, joint initiatives, integrated policy, investment in R & D and benchmarking

Why Innovation?

- ❑ Increased competitiveness
- ❑ Increased efficiency
- ❑ Cheaper products and services which are more cost-effective than those offered by competitors
- ❑ A more prosperous economy
- ❑ Better quality of life

Incremental or radical innovation?

“Small ideas ... the key to creating sustainable competitive advantage from big ideas. While big ideas may be readily copied or countered by competitors, the small ideas that exploit them are part of the organization’s learning, and remain largely proprietary. The sustainable competitive advantage created by these smaller follow-up ideas may well be *greater* than that of the big idea itself.”
(Alan G. Robinson and Dean M. Schroeder)

Innovation in organisations

- How innovative is your organisation?
- Does it encourage creativity and innovation?
- Can the conditions that facilitate creativity and innovation be identified?
- Is it possible to identify barriers to creativity and innovation within organisations?

Six barriers to organisational innovation ...

1. Lack of organisational slack
2. Bureaucracy
3. Structure
4. Poor communication
5. The 'imported talent' syndrome
6. Financial aversion to risk taking

To overcome barriers ...

- ❑ Remove fear, encourage trust and sharing through better communication
- ❑ Make innovation part of everyone's performance review system
- ❑ Build in enough looseness for staff to explore new possibilities and to collaborate with others both internally and externally
- ❑ Train staff to scan the environment for new trends, technologies and changes in clients' mindsets
- ❑ Raise awareness on the critical importance of diversity of thinking styles, experience, perspectives and expertise
- ❑ Develop an idea management system that captures ideas

Innovation Management ...

- ❑ identifies innovation opportunities and facilitates their implementation
- ❑ encourages innovation which concerns technical or R & D development
- ❑ gauges impact assessment and sustainability
- ❑ manages both the demand and supply variables over medium to long-term time-frames
- ❑ explores ancillary opportunities within a wider context

Innovation Management involves ...

“developing both the ability to scan for signals about change and a readiness to move into new areas
– and let go of old ones.

Above all it suggests that the primary task is one of managing knowledge
– developing and building distinctive competence in particular fields, adapting and absorbing new and different knowledge sets when it becomes necessary and moving out of particular knowledge areas when they become redundant.”
(Tidd, Bessant and Pavitt)

Innovation is ...

The symbiosis between
'creative organisations'
and 'creative people'
produces innovation.

It is the interplay between
individual creativity and
environmental creativity that is
the driving force of innovation
in any organisation.

In organisations with an effective system for managing innovation ...

- ❑ The climate for creative thinking must be right
- ❑ An effective system of communicating ideas must exist at all levels
- ❑ Procedures for managing innovation must be in place

The Creative Climate ...

“Building a creative climate involves systematic development of organisational structures, communication policies and procedures, reward and recognition systems, training policy, accounting and measurement systems and deployment of strategy.”
(Tidd, Bessant and Pavitt)

Innovation and creativity ...

... are not the same thing!!

Creative ideas
feed the innovation process
in any organisation

Creativity ...

To dispel some false assumptions ...

- ❑ Some people are creative while others are not
- ❑ Creativity is something people have or don't have
- ❑ Creativity at work is disruptive and counter-productive
- ❑ Creativity is only relevant in certain departments (such as design, publicity and marketing)

These are all false!!!

Creativity is ...

'Creativity is not
a separate part of thinking.

It is not a luxury to be used by artists
... Creativity is as much the business of
executive management
as of R&D departments.'
(Edward de Bono, 1971)

Creativity and the Future ...

Creativity is both a process and a skill.

Creativity is essentially concerned
with the future.

The creator can never be sure
of the result.

Elements of risk-taking
(a skill of entrepreneurship)
concerning the future (foresight)
are important for creativity to flourish

Creativity and the Future ...

Although the creator never knows the actual result until it is realised, the creator repeatedly takes decisions now that are intended to produce the desired results in the future. These 'creative decisions' are derived from experience, intuition and expectation and involve risk-taking.

Creativity and lateral thinking ...

As a process,
creativity relies mainly
on 'lateral thinking'

[seeking to solve problems by unorthodox
or apparently illogical methods – de Bono]

or what is often called
'thinking out of the box'

[divergent thinking or idea generation]

Creativity is a skill which we can learn and improve with practice ...

'We tend to regard creativity as something brought about by chance, ... or as a mysterious magic gift which some people have and others do not. Creativity is all these things, but only because we have made no attempt to introduce discontinuity into our thinking in any other way.'
(de Bono, 1971)

Possibilities and patterns in the brain ...

'Knowledge of the existing world, and judgement to check that knowledge, allows us to use existing methods.

The past millennium of recognition, judgement, discrimination allows us to use our knowledge but does not help to design new possibilities.'

'The downside of patterns is that once we have set them up we are trapped by them.

In order to see a new idea there is a need to create it first in the brain as a possibility, a speculation, an hypothesis or a construct. This needs creativity, design and imagination.'

(Edward de Bono, 1999:16)

Linking creativity to the future ...

Futures thinking
and futures scenarios represent
“an art which requires many talents,
e.g. non-conformism, intuition
and common sense”
(Godet, 2001:258)

One example of where new talents and skills are necessary: Careers

'The career, as an institution, is in unavoidable decline.

The emergence of knowledge-based economies means the creative destruction of many time-honoured practices, including those at the core of traditional career structures. This change implies a fundamental shift in the attainable aspirations of the working majority, but so far it is little understood. Public policy is still based on promises which assume careers to be the model for desirable employment. ...

It is not just that most people must expect more jobs in a lifetime, or have to switch vocation.

The very idea of a career now makes less and less sense of most people's working lives.'

(Fernando Flores and John Gray, 2000)

Careers and change ...

'The career has been a core social institution of twentieth century industrial civilization. ... a career has been the most important route to achieving the personal autonomy to which most still aspire.'

'The corrosion of this institution [careers] is the principal economic challenge facing the working majority in late modern societies.'

'New thinking about individuals' economic lives is needed.'
(Flores and Gray, 2000)

Three significant causes of the decline of the career ...

- New technologies
- The increasing customisation of products and services
- The impact of globalisation on local knowledge

New technologies ...

New information and communication technologies are spurring the dissolution of many industries and occupations.

Service industries that mediate between buyers and sellers are particularly vulnerable to the technological displacement.

Eg. Travel agents, sales people in retail stores and the banking sector, also the www has effects on the publishing industry – technologies for book production and distribution are now available to anyone through the web and new technologies may displace the concept of the finished book

Customisation and customer sensitivity ...

The new economy is defined by perpetual change and the responses of governments and people will bring about further transformations in productive life. Customer sensitivity for product innovation, customer retention and achieving the cost advantages of information technology will force innovation into new fields. Even traditional careers such as medicine and law are not immune from these pressures for change.

Globalisation of new technologies and local knowledge ...

- Will make many kinds of local and specialised skills that informed careers in the past redundant
- Globalisation implies the worldwide diffusion of new technologies

BUT

- New technologies cannot do many things by themselves
 - Can new technologies replace family life or do away with the constraints of time and mortality that are common concerns?
 - New technologies *are*, however, transforming the contexts in which we work, by making many traditional sorts of local knowledge less useful.

How is trust built?

- Familiarity is no longer the basis of trust.
 - As the value of geographically based knowledge decreases, relationships of trust are built out of increased transparency in costs, frankness about interests, assessment of performance, and recognising and respecting unfamiliar identities.
- As industries change rapidly, skill in coping with new social contexts is often more useful than slowly built-up understandings of established social ways of doing things.

Three forces:

Technology, customisation and globalisation

- The future belongs to knowledge based economies
- But we have not fully grasped the fact that careers and the ways of acquiring and using knowledge that they embodied are decreasingly productive in these economies

Knowledge based economies

- Knowledge based economies will rely less on static, industry-specific occupations and more on the continual restructuring of information and technology to meet fluctuating demand.
- But the human needs and values that our careers have served still remain ever-present

Two significantly different forms of working life are emerging

Wired vs. entrepreneurial life

- The wired (fast, globally networked, project-centred) form of productivity which is emerging in high-tech and media centres.

Wired productivity creates new social goods and ethical values which replace and diminish our esteem for the traditional careerist values.

- The entrepreneurial life accentuates new values, and can support the traditional social goods of the career in new ways.

***Many working lives are both wired and entrepreneurial
Understanding these emerging ideals will enable us
to form social policies that successfully address
the death of careers***

The concept of the career as the central form of working life ...

- School and university systems direct young people towards specific professions and occupations, encouraging investment in the expectation of lifelong careers
 - Tax systems and banking procedures for granting credit are modelled on a world in which the credit-worthy majority are employees or professionals who will spend a working lifetime as practitioners of a single craft or vocation
 - Our pension systems reflect this same anachronistic pattern of working life.
- This is why radical reform is imperative.***

The skill of adding value ...

- Many of the careers for which young people are trained will not survive throughout a working lifetime.
- What young people most require from their schools and universities is not necessarily vocational training or training in traditional academic disciplines.
- Students now in traditional educational programmes, continuing education or retraining programmes need to learn the skills necessary for building value-creating associations.

What skills are needed for the entrepreneurial life?

- Training people to look for opportunities for value creation and to mobilise others to pursue the new value.
- This reorientation of education aims at inserting a new core of entrepreneurial skills, some of which draw on older disciplines.

Education and the need for change ...

Whether or not they had merit
in the past,
our traditional educational practices
are failing to equip people
for the world in which
they will have to live

Problem solving is not enough ...

The need to add value ...

To work effectively people need to be able to make offers to produce special value for customers, whether these customers are consumers or other groups within the same organisation.

Problem solvers do not think in these terms. They expect the world to reveal itself in a series of discrete problems.

What skills are required?

- To learn to listen to their friends and colleagues differently
 - To abandon the current form of network building
 - To learn instead how to build and coordinate commitments, manage power, build and maintain trust, and establish compelling identities
- People will need to learn some basic skills that we may have assumed, until now, belong to leaders alone

Entrepreneurs need to learn ...

- Value-based strategies for forming alliances to destabilise, dislodge and reconstitute power.
- Such training will draw on certain parts of the disciplines of strategy, marketing and the humanities.
- Educational practices that leave people with a view of the world as composed of discrete problems and of themselves as problem solvers have little future in a world that is being continuously transformed by new technologies and new global relationships

The value of positive thinking ...

Entrepreneurs recognise and accept
windows of opportunity
that they feel approaching
Where others are possessed
by resentment,
entrepreneurs are possessed
by wonder!

How to create meaningful working lives ...

- The new technologies that are changing our lives will not, by themselves, give meaning to the new world they are creating
- If work is to be meaningful for most people in the near future, we need to rethink some of our inherited institutions and practices
 - We need to think of our working lives as opportunities for commitment, creativity, innovation and entrepreneurship

Towards a new view of entrepreneurship ...

Which differs sharply
from current views
where entrepreneurship denotes
a narrowly individualistic mode of life,
motivated exclusively by financial gain

The basics of entrepreneurship ...

- Starting any sort of association that brings something that people did not think possible into a community counts as entrepreneurship
- There are social entrepreneurs, civic entrepreneurs and commercial entrepreneurs
- Most people will benefit by adopting a basic set of entrepreneurial practices in their working lives and applying them to the social, civic and commercial institutions within which they are active

Entrepreneurship is a skill to ...

- Recognise opportunities and possibilities
- Generate ideas to maximise benefits of opportunities and possibilities
 - Acknowledge the rewards that can result from risk-taking

Personal characteristics of an entrepreneur ...

- motivation
- ambition
- innovation
- cooperation
- proactiveness
- risk-taking

Entrepreneurship is a skill for ...

- ❑ those who operate independently or start up new business ventures
- ❑ those in employment who are committed to success and who wish to add value to both themselves and the organisation with which they are employed

Entrepreneurial skills for increased creativity and innovation

'The entrepreneur is a maker of history,
but his guide in making it
is his judgement of possibilities
and not a calculation of certainties.'

(G.L.S. Shackle)

Entrepreneurship and Foresight

'The true entrepreneur does not live merely in the context of the present. The entrepreneur and the enterprise exist now, but always with a view to the context of the future. The implications of today's decisions are realised tomorrow.'

(Guzman and Santos,
University of Seville)

Entrepreneurship and Foresight

If the entrepreneurial context is shifted from the present to the future, decision making becomes more complicated and potentially less rational.

It requires consideration of uncertain market developments, undiscovered technologies, changing organisational patterns, and ever-shifting financial options. The future is open only to the imagination.

Foresight, Innovation, Entrepreneurship and Creativity

- Living with ambiguity
- Flexibility in our thinking
- Using the familiar in unfamiliar ways
 - Inhabiting the future
 - Learning through collaboration
- Using trends to facilitate the process

Foresight, Innovation, Entrepreneurship and Creativity

- the use of the imagination
- the cultivation of a sense of enquiry and inquisitiveness
- the motivation to make a leap towards a future which is still unknown and uncertain

***This is essential
as technological and social changes
are ever present!!***

What is considered innovative today?

- ❑ New ways of converting face-to-face learning to e-learning to capture more international target markets
- ❑ Holographic keyboards and monitors for better mobility
- ❑ Enhanced memory and mental processing through chips in the brain
 - ❑ One charger for all electronic devices
- ❑ Smart robots as pets, home help, prosthetic devices, nurses and companions

Basic human needs and social issues can be improved through innovation and foresight

- Water
- Food
- Shelter
- Sanitary facilities
- Education
- Health
- Entertainment, media and communication

How can this be done?

Through a strategy
that is sustained and maintained
in the medium to long-term through:

- ❑ Training in flexible mind sets (creativity)
 - ❑ Innovation management (strategy)
 - ❑ Futures literacy (foresight methods)
 - ❑ Risk taking (entrepreneurship)
- ❑ Learning how to recognise opportunities (entrepreneurship)

Some paradoxes in today's life ...

- ❑ Risk and innovation exist uneasily alongside prescription, an emphasis on outcomes and the 'big-brother' phenomenon
- ❑ We are isolated in a globally connected world
- ❑ Education is something we 'finish' in spite of the emphasis on 'life-long learning'

We need creativity and foresight to think of innovative ways to move beyond the warm glow of an idealised present!

Creating possibilities and recognising opportunities through foresight ...

- To counter uncertainty and reduce complexity
- Thinking about the future, creating and sharing alternative scenarios and visions, planning and acting now to ensure a better future
 - Creating and exploring alternative future scenarios in an attempt to clarify the potential future implications of present action
- Taking action now to formulate policy to make a desirable future occur or to adapt to unfavourable circumstances

Linear vs. exponential thinking ...

'The biggest issue ... is linear vs. exponential thinking.

It is remarkable how thoughtful people,
including leading scientists, think linearly.

This is just wrong But even though someone may be an expert regarding one aspect of technology or science, doesn't mean that they have studied technology or forecasting.... The common wisdom is to think linearly, to assume that the current pace of change will continue indefinitely.

But this attitude is gradually changing...'

(KurzweilAI.net – Ray Kurzweil)

*Two possible future scenarios ...
Do we really have a choice?*

Economic prosperity through
creativity, innovation, foresight and
entrepreneurship

versus

Economic stagnation – due to
individuals and organisations that
are not receptive to opportunities,
possibilities and change

To conclude ...

The story of the fly ...

Thank you for your attention!

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instituteofthinking@um.edu.mt