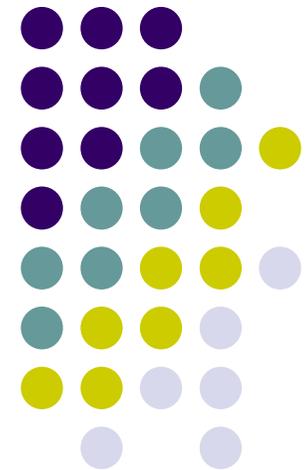


High-Level Scenarios for the Future of Cognitive Radio Business

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Presentation overview

- Stating the problem
- Choice for scenario planning
- Proposed scenarios for the future of CR
- Discussion, conclusions



Problem identification

- After a decade of R&D efforts in the field of CR, we still do not see working prototypes and the future of CR business proposition is still very much in question
- The definition of CR is rather broad and encompass a plethora of different use cases
- So we need a high-level framework for strategic thinking and discussions of the future of CR business



Scenario planning



- High level of abstraction, providing a broad overview of general directions for the future
- A widely used tool for strategic thinking, well adaptable to different concepts
- Methodologies used for building scenarios:
 - Intuitive Logics (IL)
 - Probabilistic Modified Trends (PMT)
 - “La Prospective”





Preference for IL

- IL is better suited for the contexts with following features:
 - absence of quantifiable historical data to characterise the development of future scenarios
 - the equal probability or, in other words, uniform uncertainty of the developed scenarios
 - orientation towards the learning and improved understanding of the involved processes rather than the reliability of the end products – the scenarios itself



Purpose of scenarios



	Once only Problem solving	Ongoing Surviving/thriving
Opening-up exploration	Making sense	Anticipation
Closure decisions	Developing strategy	Adaptive organisational learning

Adapted from Bradfield et al. The origins and evolution of scenario techniques in long range business planning. Futures 37 (2005)



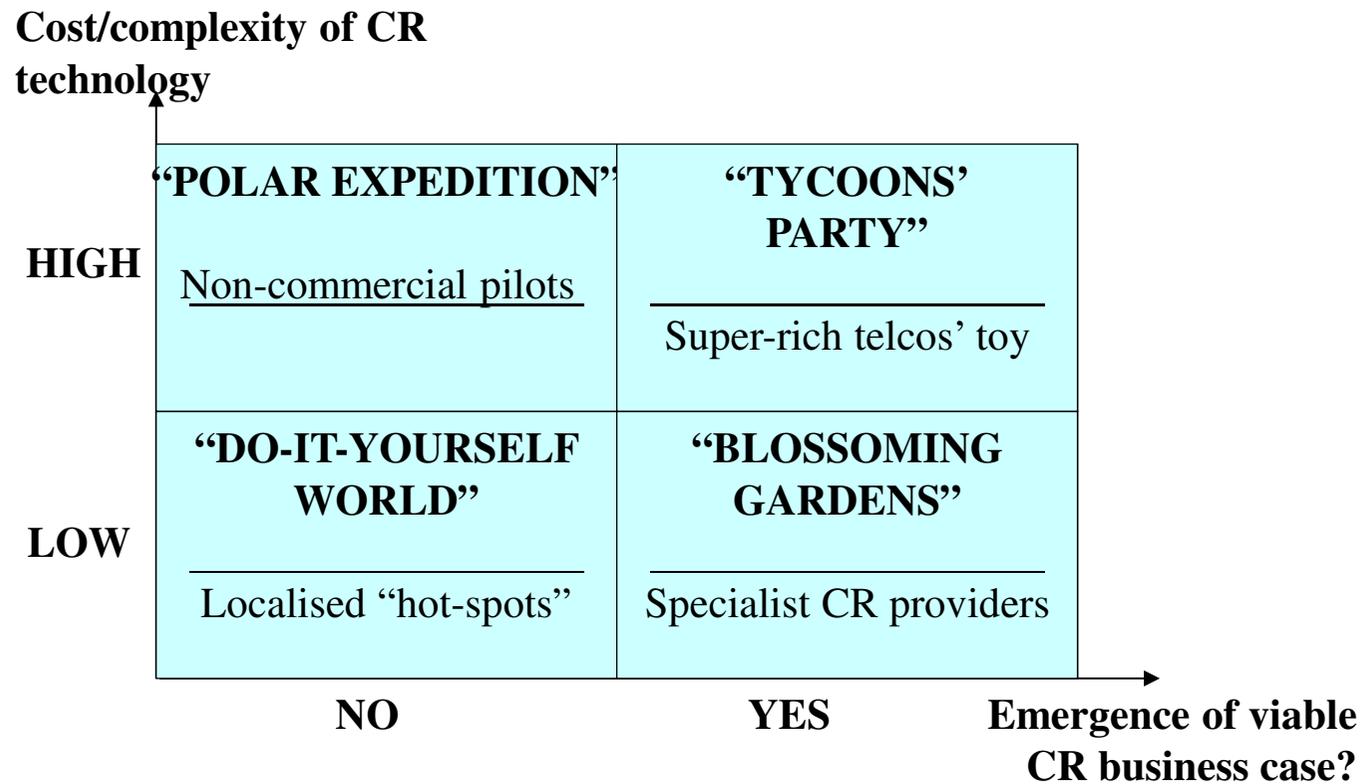
Towards scenarios of CR



- Important to choose the most prominent uncertainties
- We propose using:
 - the complexity of CR technology, and
 - its viability as business value generator
- The first is based on observation of lagging CR innovation, mired in resolving multiple complexities
- The second is based on still missing business concept, entangled by diverging interests of different stakeholders



Scenarios for CR future



Scenarios explained (1)



- *Polar Expedition* scenario:
 - appears to represent the current status quo in the industry
 - neither viable business case exists, nor the CR technology is really implementable in any commercially affordable equipment
 - thus the name of this scenario alludes to a “brave few” who could venture into singular pilot deployments for academic reasons or, alternatively, employed by high demanding users that might value some benefits more than the costs, e.g. government applications, military



Scenarios explained (2)



- *Tycoons' Party* scenario:
 - would represent the situation whereas some clear value proposition by CR and resulting business cases start to emerge, yet the cost and complexity of CR technology remains high
 - that would mean that only heavyweight market-players could afford “toying” with the new technologies
 - e.g. big telcos or the likes of Intel, Apple or Google might use the new service opportunities provided by CR for entering new market segments or cementing their existing market positions regardless of high initial costs of technology



Scenarios explained (3)



- *Blossoming Gardens* scenario:
 - would mean that the falling costs and complexity of CR technologies would lower the barriers for market entry and more players would start entering the CR business market
 - yet it is highly likely that the high-tech specifics of CR technology would remain the barrier limiting the overall number of market players to a certain number of global and regional/national champion/specialist service providers, much like the situation seen in the early days of cellular mobile

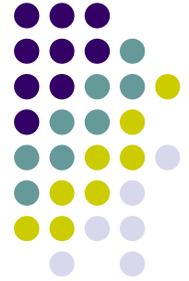


Scenarios explained (4)



- *Do-It-Yourself World* scenario:
- would represent the different kind of developmental transition, whereas the CR technology becomes affordable, yet the business case remains elusive
- in such environment it could be envisaged that the CR developments would be limited to private/local deployment islets (“CR Hot-spots”), of which the TVWS opportunistic deployments in the WiFi-like manner would be an obvious example





Scenario check

- In associated paper we show that the proposed scenarios would comply with the usual criteria for scenario planning:
 - coherence
 - comprehensiveness
 - internal consistency
 - novelty

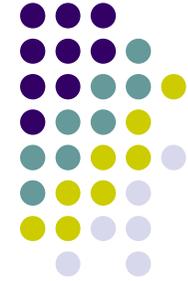


Why needing such scenarios



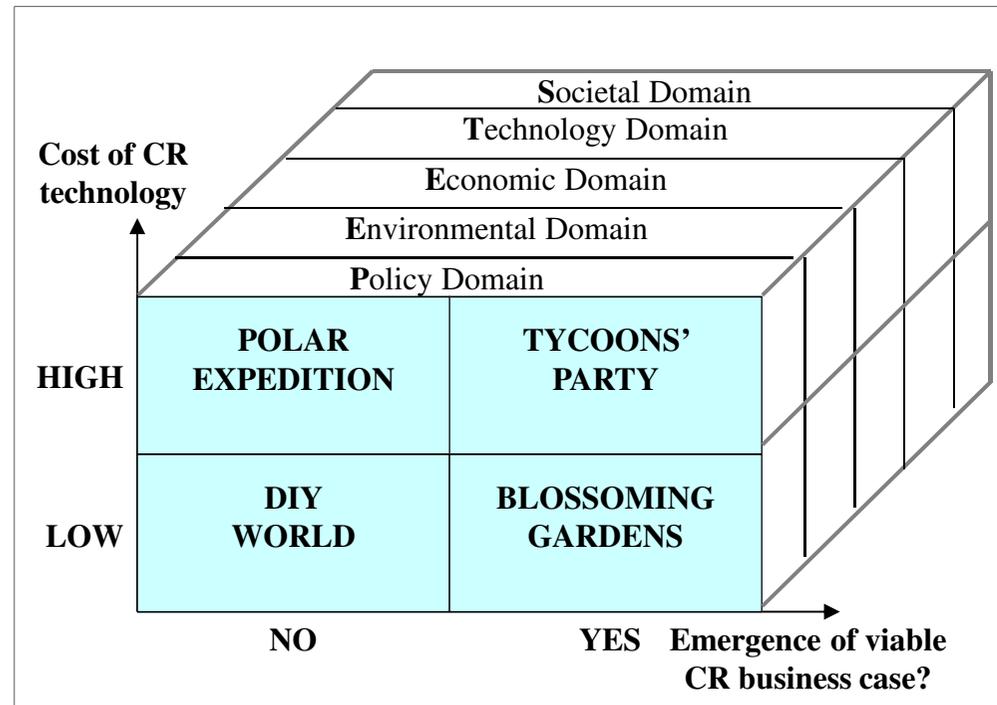
- offers a framework for discussing the development directions for CR
- seeking explanations for causal-consequential effects of identified scenarios
- possibility of adjusting the degree and focus of developmental activities by various stakeholders in accordance with the perceived current scenario situation





Scenario impact domains

- Fits well with the STEEP analysis framework
- Example provided in the paper





Conclusions, future work

- a vision offered for a set of equally probable scenarios for the future of CR innovation
- scenarios may help setting the context and choosing the strategies of more adequately responding to the current situation and, if so desired, steering it towards some other scenario-state
- further analysis would be required to clarify causal-consequential effects of the proposed scenarios in STEEP domains





Thanks for your attention!

- Any questions, discussion welcome
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