

**ACC10**

CIDEM | COPCA



Generalitat  
de Catalunya

**X Reunió Anual de Xarxes.**

La tecnologia catalana  
marca la diferència

# Grans tendències globals d'un món en transformació

[www.acc10.cat](http://www.acc10.cat)

10<sup>th</sup> Annual Meeting of Catalan Knowledge Transfer  
Networks: “Catalan Technology Makes the  
Difference”  
Foresight and Research: From  
Exogenous to Endogenous

Barcelona, April 27, 2009



**Riel Miller**  
**xperidox futures**  
**consulting**

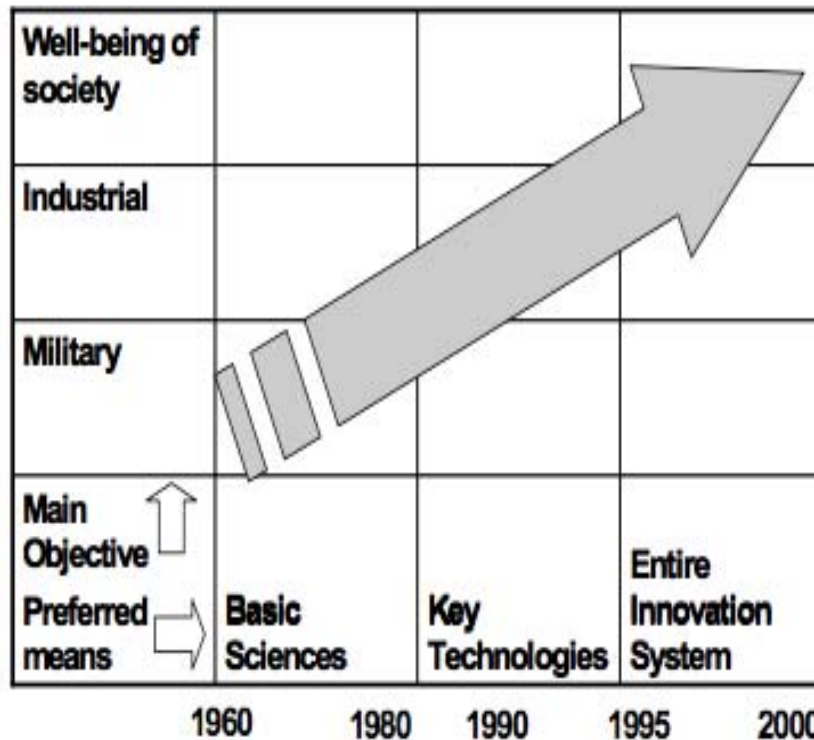
# Outline

- Brief history of foresight and technology foresight
- Foresight in Europe – evolution towards an integrated approach;
  - Widespread national initiatives
  - Framework Programmes and Foresight Infrastructure
  - IPTS and FTA
- Closing thoughts on taking an integrated approach – how to do it

## A bit of history

- Industrial era – Wells, Verne...
- Cold war - weapon systems and wars
  - contingency through simulation
  - optimization through scenarios
  - RAND Delphi for pooling expert knowledge; Herman Kahn for stories that could be used for contingency and optimization
  - Futuribles in France, WFSF, Club of Rome, Shell Scenarios, OECD InterFutures Project, Japan's 5<sup>th</sup> Generation Computing, US Office of Technology Assessment, IPTS, EFMN, ForLearn

**Figure 0.1 Development of Foresight studies throughout the last decades**



Source: Hjelt Mari, Paivi Luoma, Erik van de Linde, Andreas Ligtvoet, Janneke Vader, James Kahan: *Kokemuksia kansallisista teknologia-ennakoinneista (Experiences with national technology Foresight studies)*, Sitra report 4, Helsinki, 2001.



CORDIS



Development of research/innovation policies

**Science and Technology Foresight**



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## Knowledge Sharing Platform

The main idea behind the setting up of a European S&T Foresight Knowledge Sharing Platform is the diffusion and exploitation of the information on useful results from forward-looking activities. These Foresight activities aiming at informing policy-makers dealing with research and innovation are carried out at all levels in Europe.

### A real need for a Foresight sharing platform

On the basis of the previous activities carried out in 2001-2003 to stimulate the creation of a European area for Foresight and in particular the advice provided by the High Level Expert Groups, the Science and Technology Foresight unit of DG Research is setting up a "European Science and Technology Foresight Knowledge Sharing Platform". The aim is to develop a coherent supportive framework at the European level to ensure systematic use and optimum benefit of Foresight, and to identify and mobilise all relevant actors (at every governance level) to enable EU-wide networking and capacity building. It will moreover support the self-organisation process of the "Foresight Community" through knowledge sharing activities and events.

**The platform is structured in three different layers of activities that are implemented through a series of 11 contracts and experts groups:**

- [Monitoring Foresight activities in Europe and fostering their European dimension](#)
- [Support to mutual learning between Foresight managers, practitioners, users and stakeholders of policy-making organisations in Europe" \(FOR-LEARN project\)](#)
- [Promoting EU-wide Foresight approaches](#)



## Support to mutual learning between Foresight managers, practitioners, users and stakeholders of policy-making organisations in Europe

### Online Foresight Guide

[Home](#)[Why do Foresight?](#)[Conditions to analyse](#)[Scoping an exercise](#)[Methodology](#)[Running an exercise](#)[Follow-up](#)[Case studies](#)[Mutual learning](#)[News & events](#)[An A to Z of Foresight](#)

Foresight is a systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process aimed at present-day decisions and mobilising joint actions. Research and innovation policies are based on (implicit or explicit) visions of the future of science, technology and society.

To underpin the establishment of the European Research Area (ERA) there is a need for open coordination of these visions and hence cooperation on Foresight.

One of the European Commission's main Foresight activities under the Sixth Framework Programme is to establish a European Foresight **Knowledge Sharing Platform** (KSP). The KSP aims to provide support and enhance the interconnections between Foresight programmes, initiatives and institutions in close co-operation with all relevant actors in Europe and, when necessary, orienting them towards common issues, at inter-regional, trans-national or European level.

The KSP is today a major European Union undertaking which is being implemented by DG Research. One of its core activities is to support mutual learning among Foresight managers, practitioners, users and stakeholders in Europe (FOR-LEARN). The FOR-LEARN project is run by **DG JRC-IPTS** on a mandate from the European Commission DG RTD. It covers the entire range of activities related to the promotion and the structuring of a European science and technology Foresight area.

The three main functions of the KSP are:

- To mobilise Foresight as intelligence for EU policy, mainly research and innovation policy;
- To foster exchanges of experiences between Member States and regions; and
- To consolidate and better structure the Foresight knowledge base.

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## Welcome to the European Foresight web site

The work of the European Foresight team of the Knowledge for Growth (KfG) Unit of JRC-IPTS centres on the provision of forward looking intelligence to support decision making and enhancing the use of Foresight as an instrument for policy making in Europe.

The focus of our activities is increasingly on more policy-relevant foresight application and methodology development, particularly by developing approaches to the early identification of emerging issues that will have an impact on European policies.

We are also broadening our scope beyond research and innovation policy to a more general application of Future-Oriented Technology Analysis (FTA), including application of combined qualitative foresight and quantitative modelling approaches.

### European Foresight Business in Short

A fundamental premise of the European Foresight activities is that future-oriented thinking is a necessary policy response component to the environment of accelerated socio-economic and technological changes.

Therefore, future-oriented technology analyses (FTA) and studies (including strategic Foresight, forecasting and technology assessment) are embedded in the activities undertaken by the European Foresight team to deepen the understanding of changing challenges and opportunities.

This is done to enable policy makers to look into the future in order to identify and choose among policy options, rooted in numbers whenever feasible, as well as to shape long-term policies and actions.

Moreover, the accumulated expertise and the neutrality of JRC-IPTS distinguish it from other EU organisations involved in foresight and FTA.

This allows JRC-IPTS to increasingly become a prominent partner within different Framework Programme consortia.

JRC-IPTS has also become a natural central node in leveraging a platform for mutual learning as well as knowledge development and sharing by bringing together widely recognised experts and stakeholders in general.

## Highlights

**NEW**

**EU and the State of the World in 2025:**  
[Give your opinion...](#)

## Associated Links



[Future-Oriented  
Technology Analysis  
International  
Conference](#)

**FORLEARN**  
Foresight Guide  
[Online Foresight Guide](#)

  
Institute for  
Prospective  
Technological Studies

  
erawatch





# Science beyond Fiction

fet09 | 21-23 April 2009 | Prague

## The European Future Technologies Conference



The **European Future Technologies Conference and Exhibition** is a new European forum dedicated to frontier research in future and emerging information technologies. Leading scientists, policy-makers, industry representatives and science journalists will convene over 3 days to discuss today's frontier science, tomorrow's technologies and the impact of both on tomorrow's society.



The European Commission's Future and Emerging Technologies research scheme



The Academy of Sciences of the Czech Republic



The Czech Technical University in Prague

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### What's new?

[Press Conference materials](#)

The final **Conference Programme** is online.

Visit the **Exhibition and Poster sessions!**

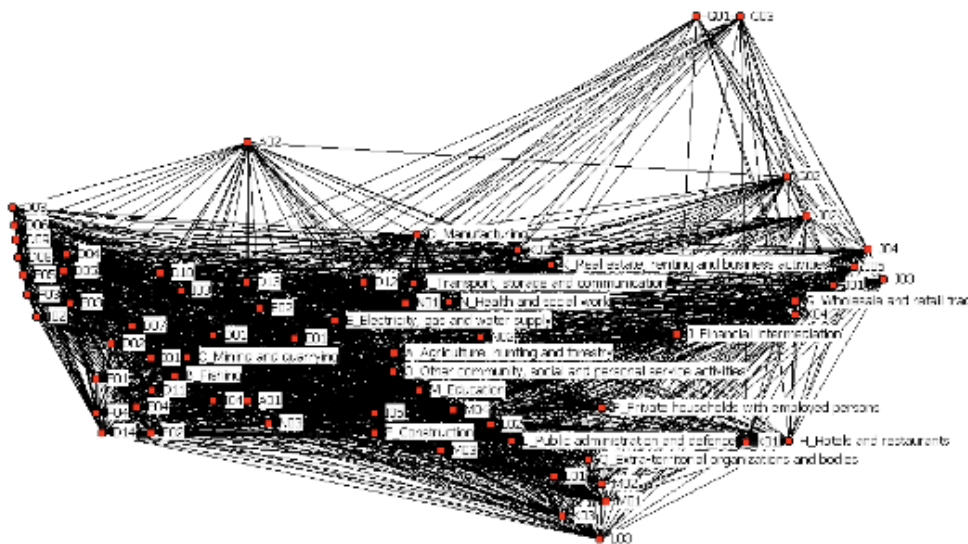
[Submit an On-the-fly](#)

# European Foresight

- Many national initiatives throughout Europe
  - Finland, Ireland, France, Germany, UK, Netherlands, Belgium, etc.
  - Recent work by EFMN Mapping Foresight
- The Shift in Europe from Sector Specific to General Diffusion
  - Framework Programmes move from sector specific to general diffusion
  - Future of Research in the ERA
  - IPTS and FTA also move towards integration



# *Mapping Foresight*



- European Foresight Monitoring Network
- Rafael Popper and the team in Manchester

**REVEALING HOW EUROPE AND OTHER WORLD REGIONS NAVIGATE INTO THE FUTURE**

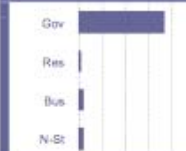


**Spain**  
Source: 44 cases

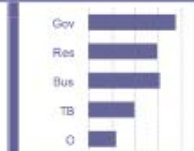
### Time horizon (years)



### Sponsors



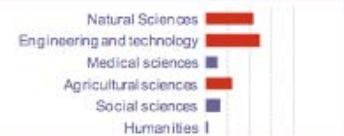
### Audiences



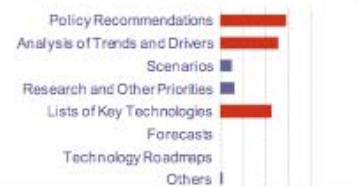
### Territorial scale



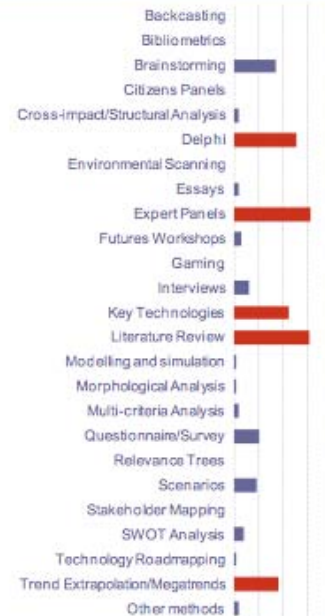
### Research Areas (Top 3)



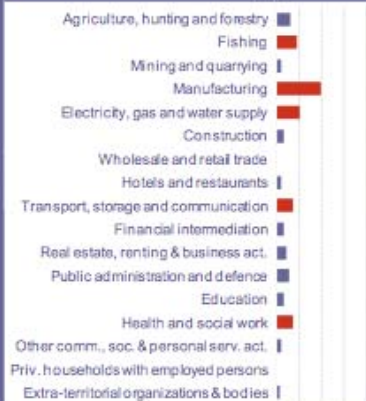
### Outputs



### Foresight Methods (Top 5)



### Socio-economic Sectors (Top 5)



*Nano-Bio-Info-Cogno-Socio-Anthro-Philo-*

HLEG  
Foresighting the New Technology Wave

Converging Technologies –  
Shaping the Future of European  
Societies

*by Alfred Nordmann,  
Rapporteur*

Report

2004

Over time the  
FP's focus  
extends to  
encompass  
more sectors  
and to seek  
joined up –  
socio-technical  
view of  
technology



**CREATIVE SYSTEM DISRUPTION TOWARDS A  
RESEARCH STRATEGY: *BEYOND LISBON*  
*SYNTHESIS REPORT - 2005*  
*KEY TECHNOLOGIES EXPERT GROUP***

The discussion on Policy Orientation and Vision-setting and transition policy management and coordination points to the critical role of foresight in preparing the ground for a system disruption. A number of the reports highlight foresight's multi-dimensional role in achieving policy transition and system innovation.

The cover features a collage of images: a large eye icon at the top, a European Union flag in the center, and a person's profile on the left. The background is a mix of blue and green tones with abstract patterns.

# Using foresight to improve the science-policy relationship

FINAL REPORT

March 2006

Synthesis Paper

**The Future of Key  
Research Actors in the  
European Research Area**

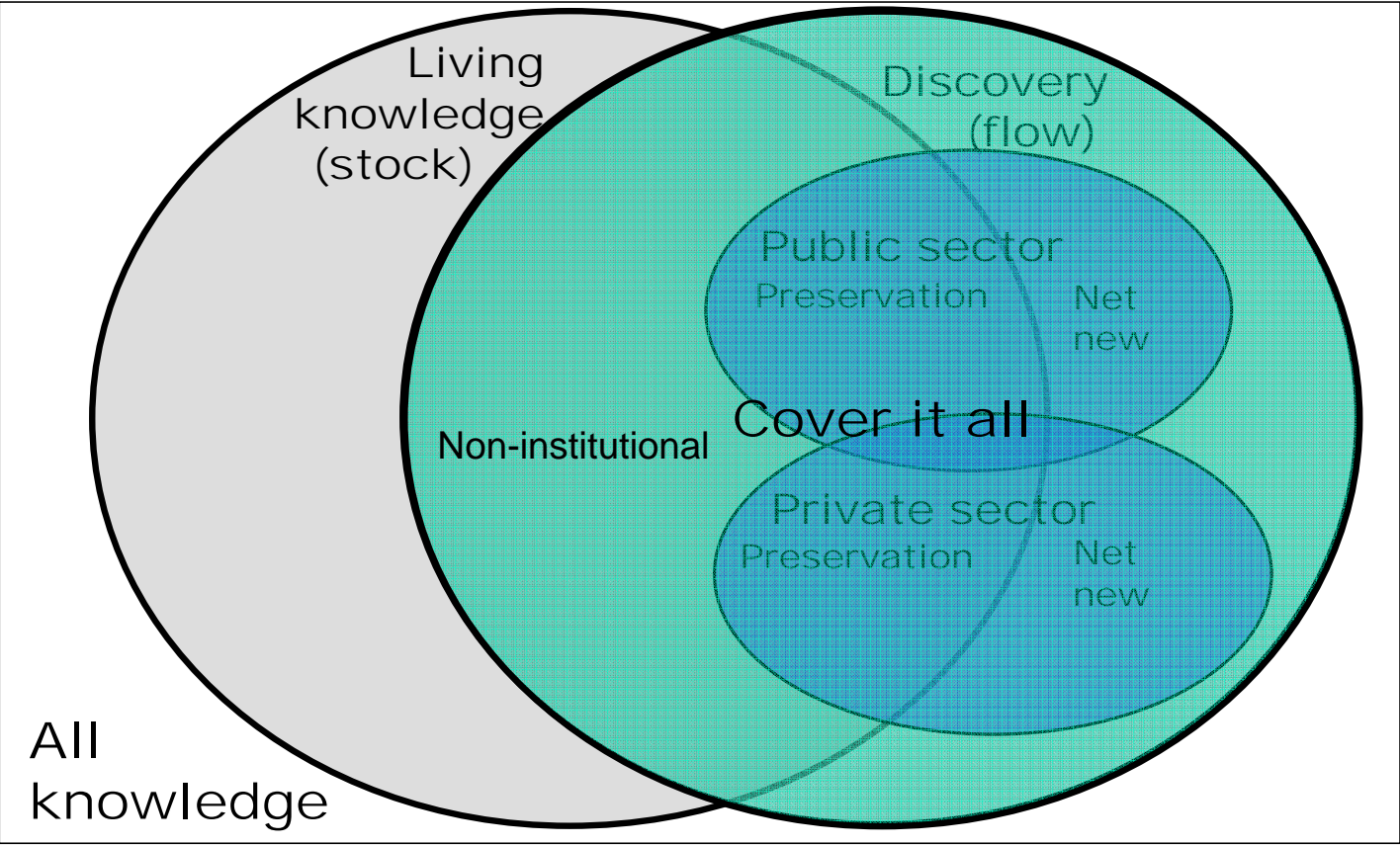


EXPERT GROUP FINAL REPORT

EUR 22961

Chair:  
Madeline  
Akrich;  
Rapporteur:  
Riel Miller  
Published  
2007

# Knowledge Production From Mode 1 to Mode 2 to Mode 3





# **FTA** Future oriented Technology Analysis

## **The 3rd International Seville Conference on Future-Oriented Technology Analysis (FTA)**

Impacts and implications for policy and decision making



**Book of abstracts**



# Europe, Globalization and the Lisbon Agenda

## Maria Joao Rodrigues - 2009

- Improving public administration
  - Role for strategic planning
  - Role for foresight
- Holistic, multi-level approach in a world that is expected to be more globalized
- Role for the European institutions, including FP and European Research Council

Foresight is instrumental in informing the design and implementation of research and innovation policy with three distinctive roles:

- Corrective role - addressing deficiencies and systemic failures and policy lock-ins
- Creative role - stimulating the conditions whereby new networks and structures can evolve and grow.
- Disruptive role - encouraging

an emphasis on crisis or  
Source: Luke George and Jennifer Cassingena Harper, FTA for Research and Innovation  
Policy and Strategy, FTA, IPTS, 2008  
breakthrough events which can

The traditional (FTA) emphasis on production of broad-based priorities lists appears to be more of a historical phenomenon than a permanent feature, though the possibility remains that new generations of policymakers will find renewed optimism about what such work can yield if the lessons of the past are forgotten. On the other hand the more embedded role as an instrument of articulating, structuring and delivering research and innovation policy offers a robust future for these approaches

Source: Luke Georgiou and Jennifer Cassingena Harper, FTA for Research and Innovation Policy and Strategy, FTA, IPTS, 2008.

## •Adaptive/Tailored Foresight

- tailoring Foresight exercise through translating results of collective dialogue into strategic decisions in targeted phase
- better decisions through Foresight with high impact

## •Embedded/Distributed Foresight

- embedding Foresight as an endogenous feature of decision making, many Foresight elements instead of single fully fledged projects (invisible foresight ...)
- better organisational capabilities through better aligning Foresight with other strategic processes, better impact

## •Disruptive emergent Foresight

- special methods for hyper-complex subjects
- key enhancement: addressing systemic change
- change in the conditions of change
- how do we know what we do not know?

Source: Riel Miller and Philine Warnke, "ADAPTIVE, EMBEDDED, AND DISRUPTIVE FORESIGHT: RECENT EVOLUTION IN ANTICIPATORY SYSTEMS", Third International Seville Seminar on Future-Oriented Technology Analysis: Impacts and implications for policy and decision-making, Institute for Prospective Technological Studies, SEVILLE 16-17 OCTOBER 2008

# How to Embed Foresight in Research Proposals

- Considerable work at the national level – UK Horizon Scanning Centre, Canada PRI, Korea, Finland, etc.
- Ongoing methodological developments
- Shifting priorities in places like IPTS, discussions about FP8
- Fundamental issues around capacity and the challenge of the context – how the future is conceptualized in general and the implications for anticipatory systems



# Using an Anticipatory Systems Approach to Integrate Foresight

- The challenge of improving anticipatory systems
- Getting to a more sophisticated framework for embedding the future in anticipatory models with anticipatory systems
- How to embed “foresight” in the development and implementation of research?



# Every-day anticipation

**YES**

We will text message you on days you'll need umbrella with our weather report. Enter your cell below.

**UMBRELLA TODAY?**

*"It's like totally the simplest weather report ever, Julie."*

**NO**

We will text message you on days you'll need umbrella with our weather report. Enter your cell below.

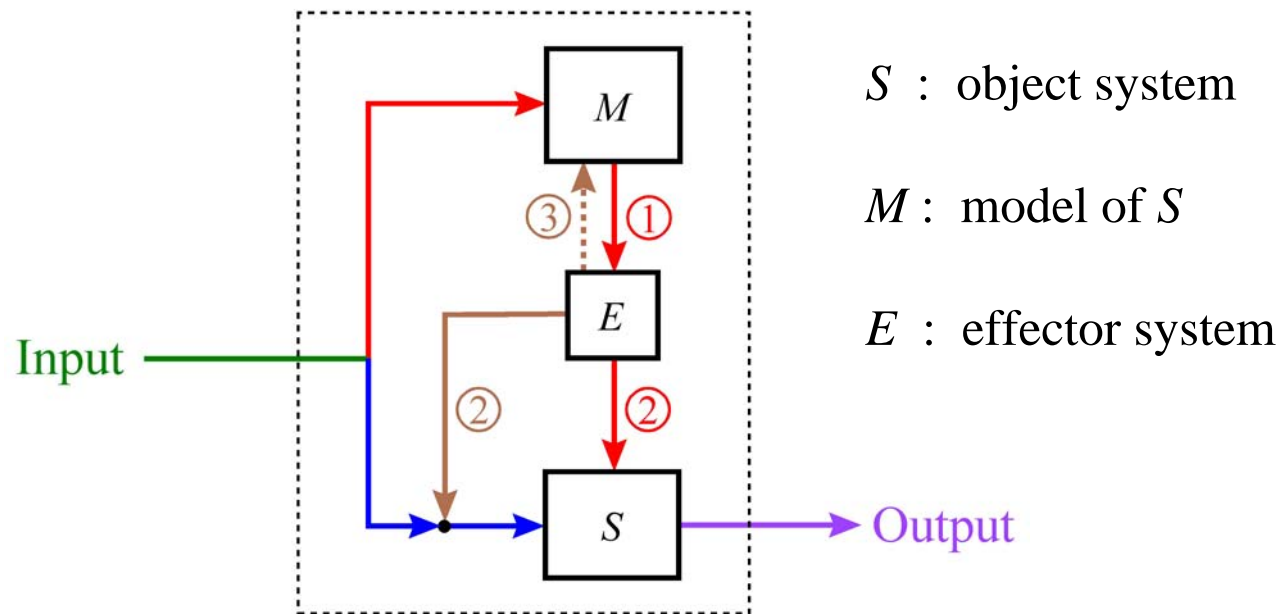
We'll schedule your weather reports for 7:00 AM

Who's your cell carrier?

GO

Make your bets

# Anticipatory System



$S$  : object system

$M$  : model of  $S$

$E$  : effector system



You could try to do it this way  
– but there are better ways!



Riel Miller  
Thank You  
[riel.miller@gmail.com](mailto:riel.miller@gmail.com)

Image: Sempe