Intelligent Modelling of e-Government Initiatives in Greece

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Project objective

- **The past:** Many e-Government initiatives in Greece failed to promote digital maturity in the past. They were revised every 2-3 years, even though their time plan assumed a 6-7 years implementation period.

- **The present:** Greece successfully employs agile development methods to reduce the administrative burden, mainly in G2C front-desk transactions

- **The future:** What will be the impact of eGov initiatives to G2B services? How far will the current eGov strategy improve the digital maturity in Greece? How soon will Greece align to EU digital standards?

Project objective

Scope: Setup an "intelligent x-ray" of G2B eGov initiatives in Greece, with predictive capabilities and traceable reasoning in order to identify gaps and compare "what-if" strategy scenarios.
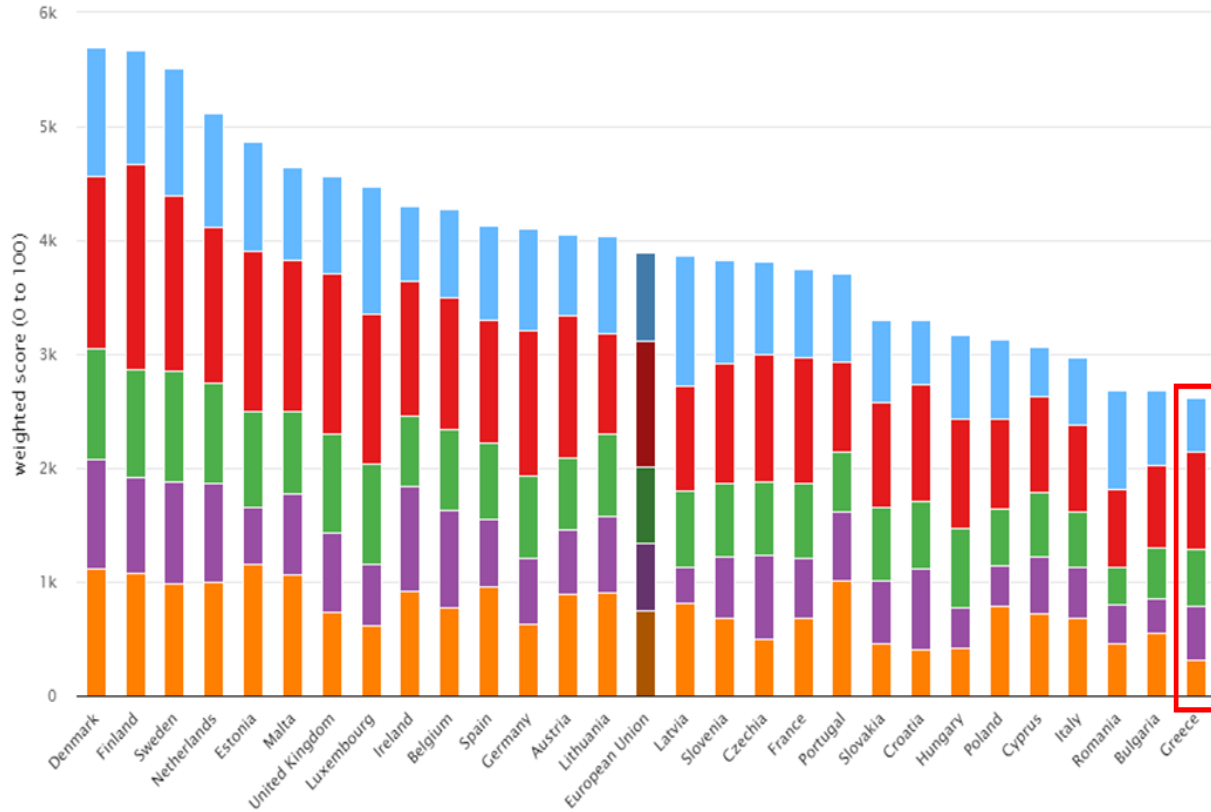
Tools: Historic analysis is augmented with fuzzy cognitive maps. Together, they offer a multi-dimensional coupling of eGov initiatives with digital maturity assessment capabilities and a strategy evaluation framework.

Output: Realistic policy recommendations to improve G2B effectiveness

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- **Digital maturity analysis**

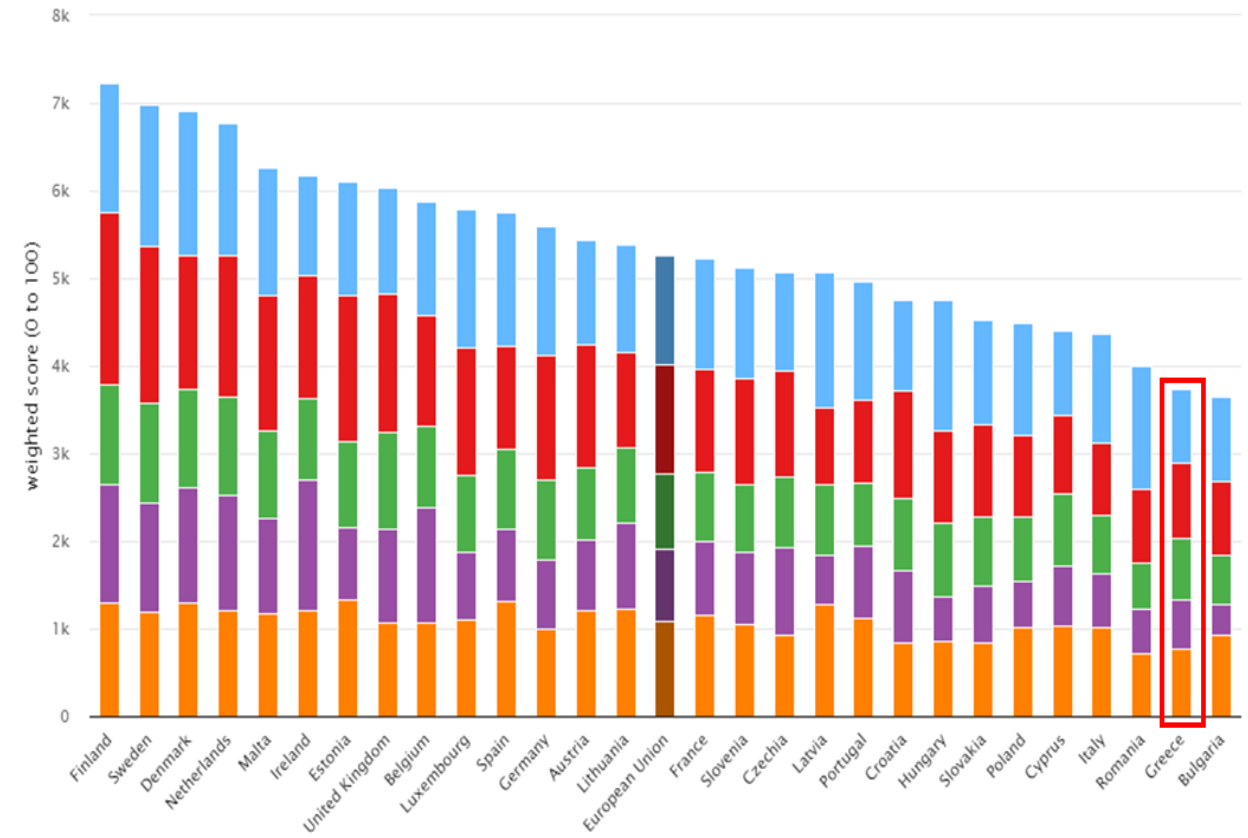- **Intelligent modelling & findings**

- **Policy recommendations overview**

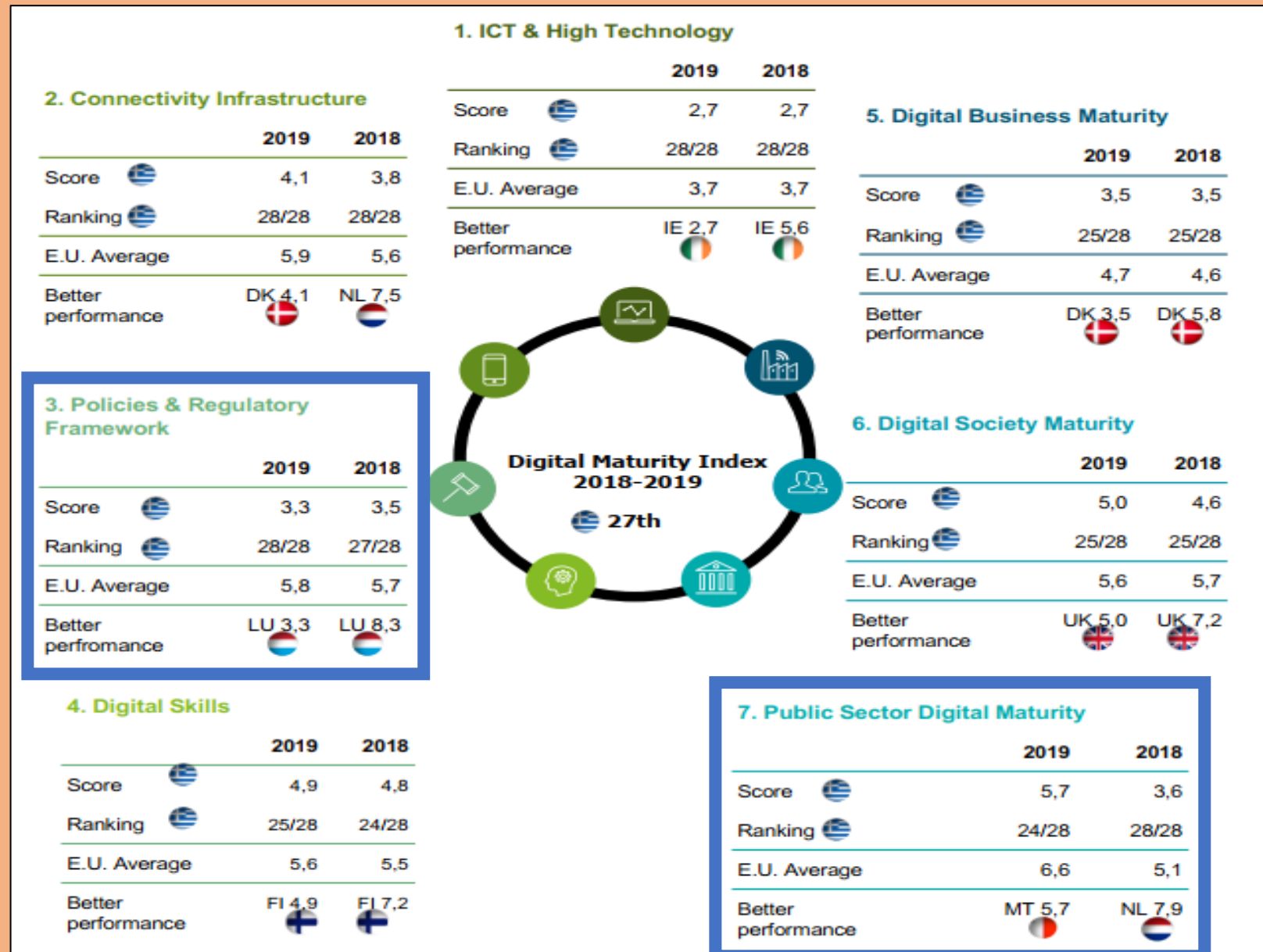# Digital maturity analysis

Digital Economy & Society Index 2015

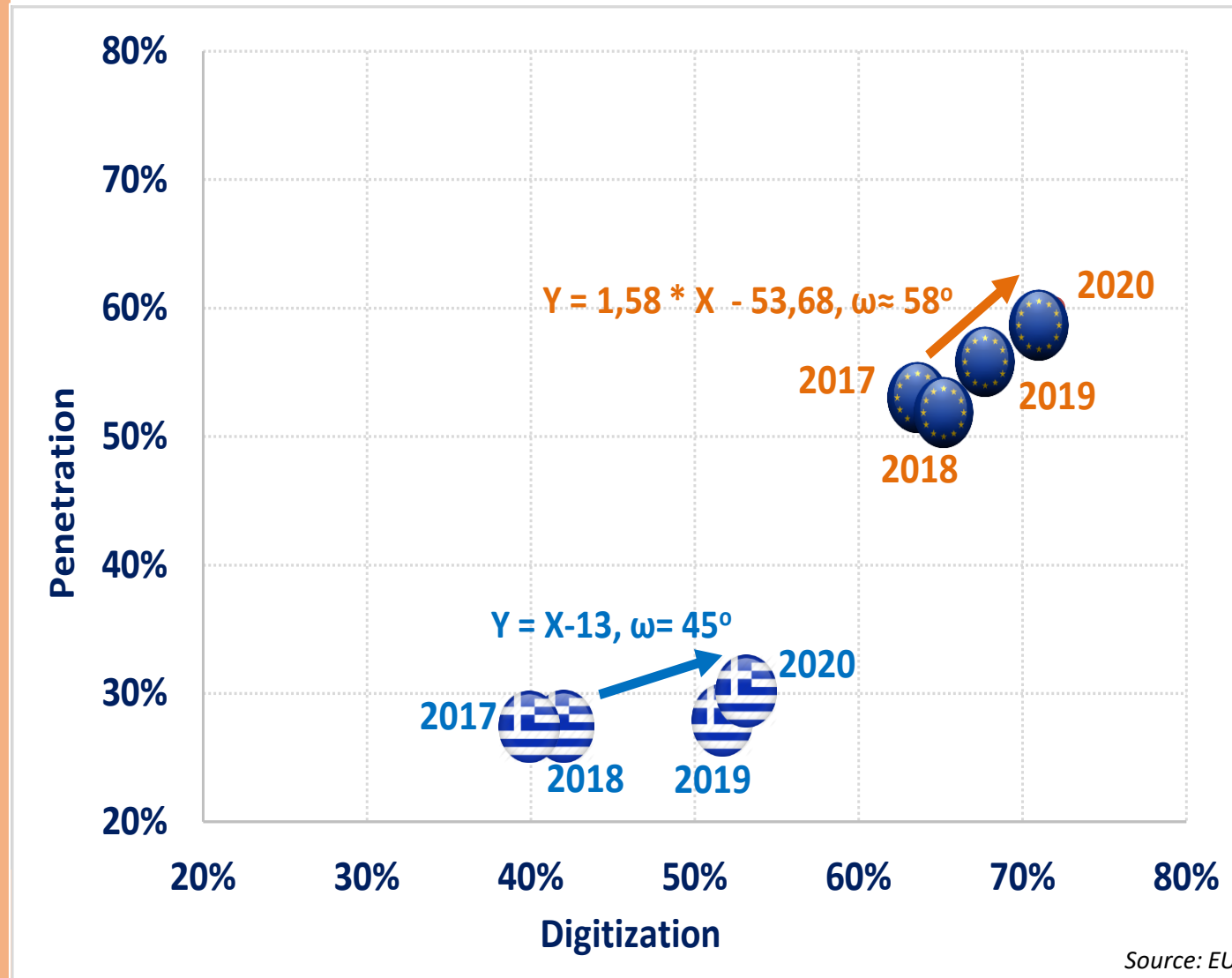

Source: EU

Digital Economy & Society Index 2020

Source: EU

1. ICT & High Technology

		2019	2018
Score		2,7	2,7
Ranking		28/28	28/28
E.U. Average		3,7	3,7
Better performance		IE 2,7	IE 5,6

2. Connectivity Infrastructure

		2019	2018
Score		4,1	3,8
Ranking		28/28	28/28
E.U. Average		5,9	5,6
Better performance		DK 4,1	NL 7,5

5. Digital Business Maturity

		2019	2018
Score		3,5	3,5
Ranking		25/28	25/28
E.U. Average		4,7	4,6
Better performance		DK 3,5	DK 5,8

3. Policies & Regulatory Framework

		2019	2018
Score		3,3	3,5
Ranking		28/28	27/28
E.U. Average		5,8	5,7
Better perfromance		LU 3,3	LU 8,3

Digital Maturity Index 2018-2019

27th

6. Digital Society Maturity

		2019	2018
Score		5,0	4,6
Ranking		25/28	25/28
E.U. Average		5,6	5,7
Better performance		UK 5,0	UK 7,2

4. Digital Skills

		2019	2018
Score		4,9	4,8
Ranking		25/28	24/28
E.U. Average		5,6	5,5
Better performance		FI 4,9	FI 7,2

7. Public Sector Digital Maturity

		2019	2018
Score		5,7	3,6
Ranking		24/28	28/28
E.U. Average		6,6	5,1
Better performance		MT 5,7	NL 7,9

Source:
SEV Hellenic Federation of Enterprises

Digital maturity analysis

eGov digital performance. Greece vs in EU, 2017 – 2020

$Y = 1{,}58 * X - 53{,}68$, $\omega \approx 58°$

$Y = X - 13$, $\omega = 45°$

Penetration (y-axis): 20% – 80%

Digitization (x-axis): 20% – 80%

EU data points: 2017, 2018, 2019, 2020

Greece data points: 2017, 2018, 2019, 2020

Source: EU

Key findings

When compared to the poor performance of the past, recent eGov initiatives improve G2B services

When compared to EU, they have little impact.

➢ Regulatory complexity in digital services stagnates.

➢ eGov service utilization remains low (25th).

➢ Complex access to G2B services (28th), few digital documents (26th), reduced transparency and accountability (25th).

➢ Usability gradually converges with EU standards.

eGov projects

- eGov strategy remained fragmented for many years, with a short time horizon and guided by quick political benefits

- There is significant activity today, partly attributed to the change of government, partly to the covid-19 crisis.

- The legal framework of public works and procurement improves gradually

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How to setup an "intelligent x-ray"

The tool: Fuzzy cognitive maps

- FCMs combine **Fuzzy Logic and Neural Networks**

- FCMs model the **knowledge or behavior** of complex systems in fuzzy neural maps

- FCMs provide **executive-level** reasoning

Step 1: Assign KPIs to measure the impact of eGov strategy on G2B services

eGov strategy hierarchy → *KPIs hierarchy*
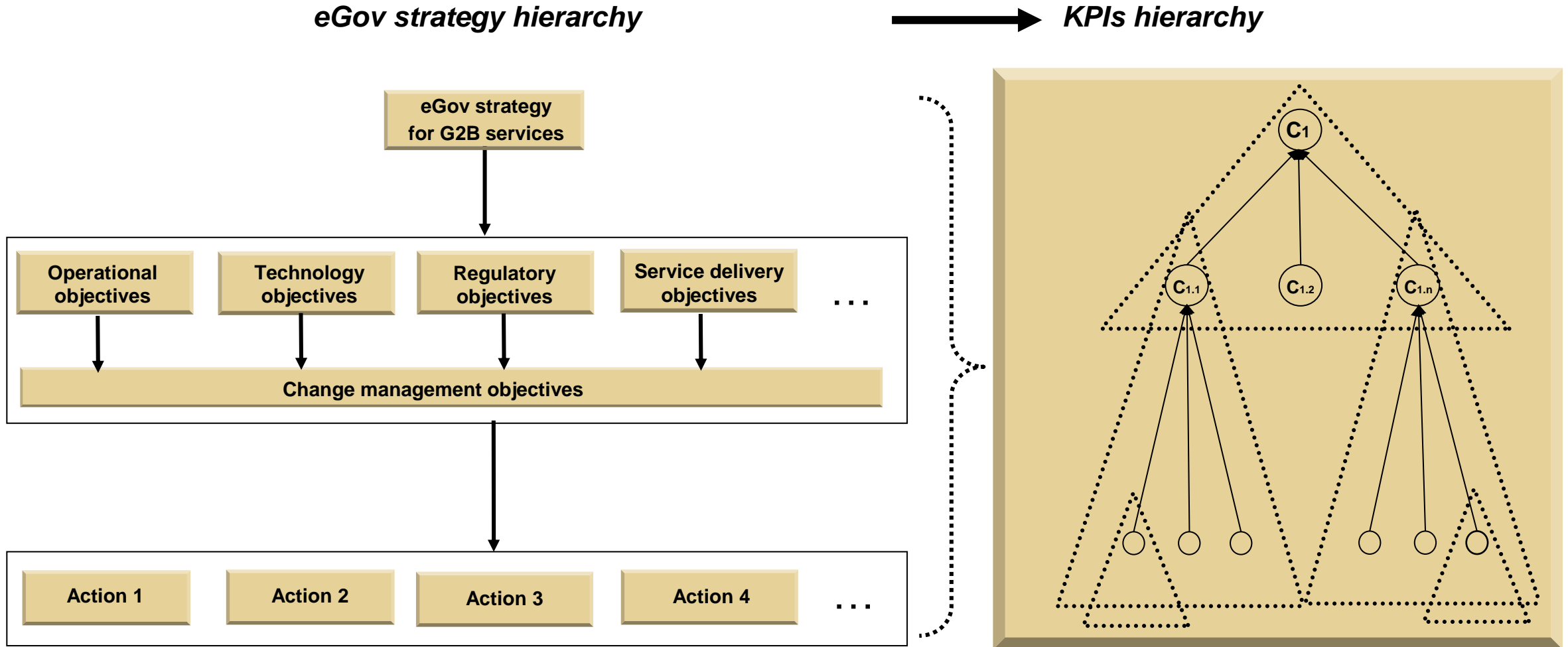
How to setup an "intelligent x-ray"

Step 2: Migrate KPIs to fuzzy structures and identify feedback loops

Step 3: Deploy FCMs. 60 concepts - 7 maps - 4 levels
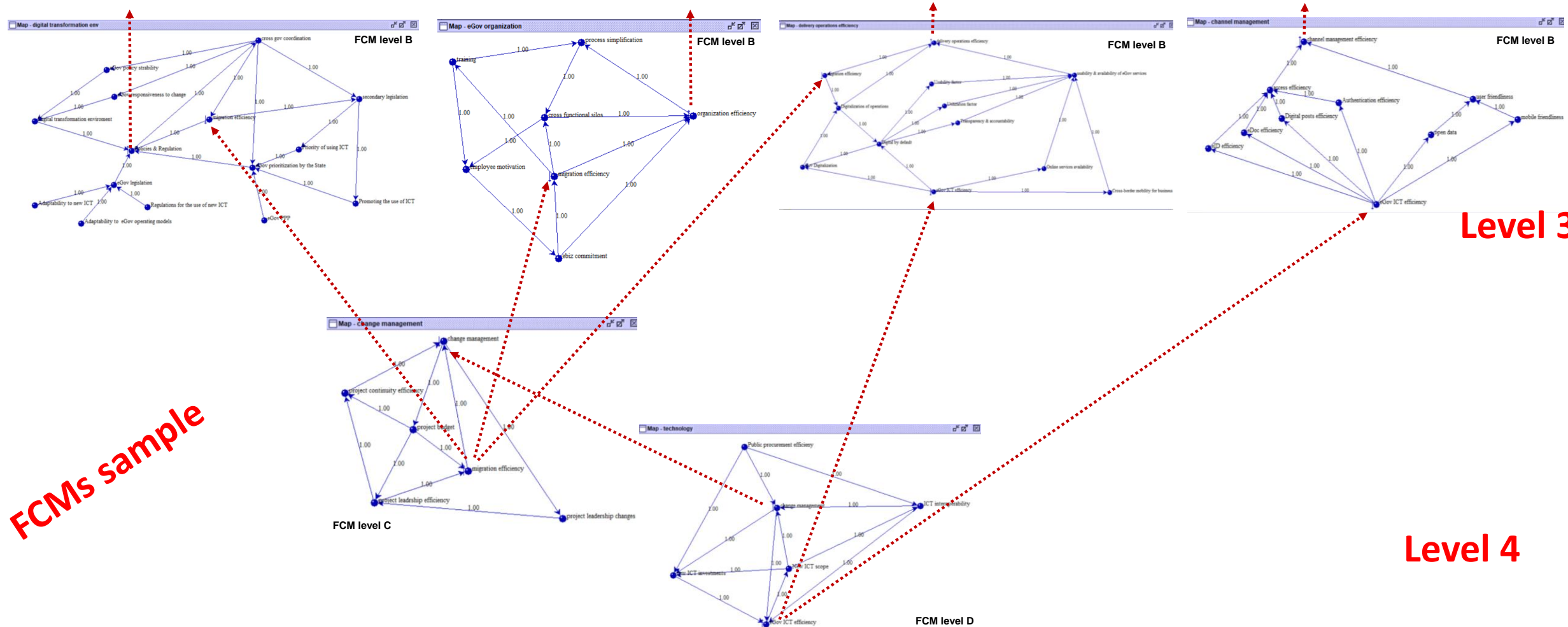
FCM level B

FCM level B

FCM level B

FCM level B

FCM level C

FCM level D

FCMs sample

Level 3

Level 4

Step 3: Deploy FCMs. 60 concepts - 7 maps - 4 levels

FCMs sample
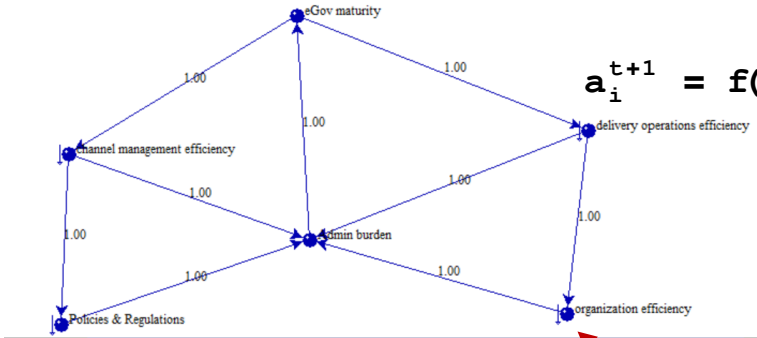
FCM level A

$$a_i^{t+1} = f(k_1 a_i^t + k_2 * (w_{hi} a_h^t + \sum_{j=1, j \neq i, j \neq h}^{n} w_{ji} a_j^t))$$

Level 1
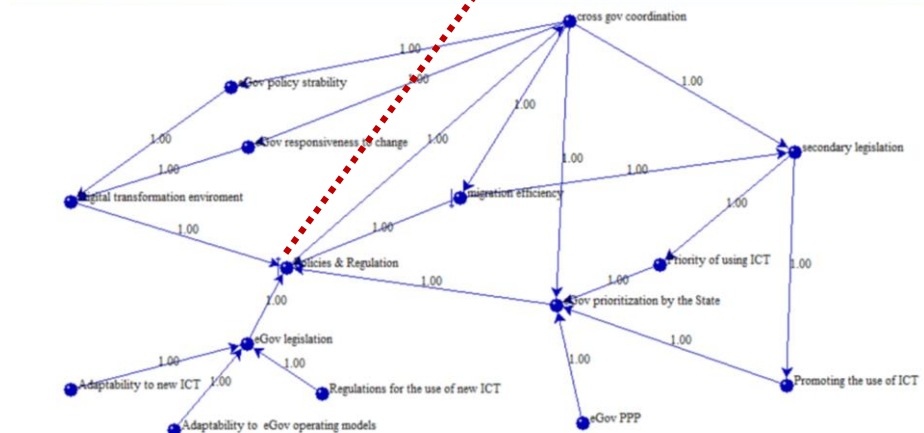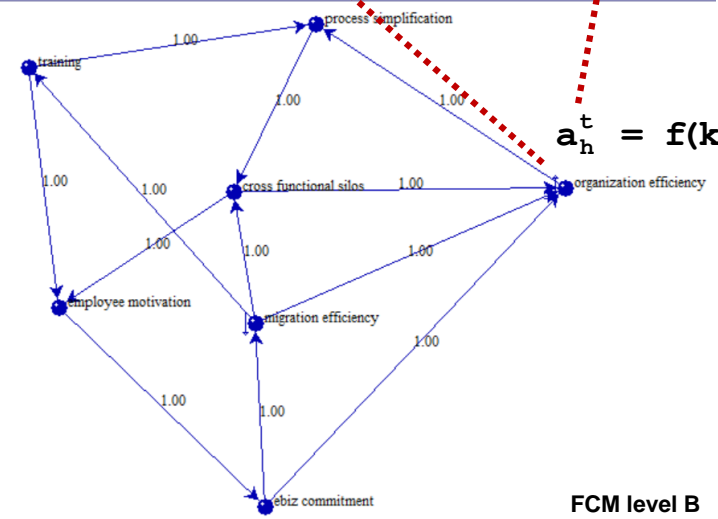
$$a_h^t = f(k_1 a_h^{t \sim 1} + k_2 * \sum_{j=1, j \neq h}^{n} w_{jh} a_j^{t \sim 1})$$

Level 2

FCM level B

FCM level B

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How to setup an "intelligent x-ray"

Step 4: Scenario building

- **Scenarios** reason for "what-if" questions

- **Scenarios** may simulate different implementation tactics: (a) Big bang (b) Successive or step roll-out (c) Ad hoc or isolated roll-out

- **Results** reason for the impact of each change to concepts (a.k.a. KPIs).

Key findings

Base scenario: Emphasis on front-desk apps to simplify G2B transactions and reduce administrative burden

- **This strategy doesn't couple** ICT with operational simplifications effectively

    => **ICT does not** deliver its full potential, regardless of the volume of investments.

    => **eGov maturity straggles** to improve beyond a "positively medium" range.

- **Front-office apps benefit G2C**, but they may not have the same impact on G2B services.

Key findings

2nd scenario: Base scenario + increased interoperability

3rd scenario: Base scenario + increased operational effectiveness

4th scenario: Base scenario + regulatory simplifications

=> reduced ICT investments ("negatively medium" reduction vs base scenario)

=> increased ICT efficiency ("positively high" impact vs "positively medium")

BUT limited impact on overall eGov maturity

=> eGov should not digitize existing bureaucracy

5th scenario: Base scenario + moderate operational changes + moderate interoperability improvements + moderate regulatory simplifications

A balanced coupling of "front-desk" ICT with "back-office" improvements ….

=> increases overall eGov maturity ("positively high" impact)

=> reduces administrative burden (almost half vs base scenario)

=> reduces ICT investments ("negatively medium" change vs base scenario)

6th scenario: Which strategy mix maximizes eGov maturity?

To utilize the full power of doing business digitally, eGov must shift focus from quick-wins on "front-desk" transactions to comprehensive process simplifications.

=> great overall eGov maturity ("very very high" impact)

⇒ increased channel and operational efficiency ("positively high" impact)

⇒ radical reduction of administrative burden ("negatively very very high" change)

=> reduced ICT investments ("negatively medium" change vs base scenario)

Summary of findings

- **Front-desk apps** improve many transactions. But they can only lead to a "positively medium" eGov maturity

- **Front-desk apps do not re-engineer** in depth any "back-office" bureaucracy, redundant approvals, functional silos or interoperability constraints.

- **An updated strategy mix** should set the process efficiency, interoperability, regulatory simplifications, and front-office delivery as equally important objectives
  - **=> ICT will deliver its full potential, even with moderate investments**
  - **=> eGov maturity will improve significantly**

SEV digital maturity index 2021 (published in 14/2/22)

3. Policies & regulations

		2021	2020
Score		4.6	3.0
Rank		**23/27**	**26/27**
EU average		6.1	5.0

SEV Digital Maturity Index 2021

25th
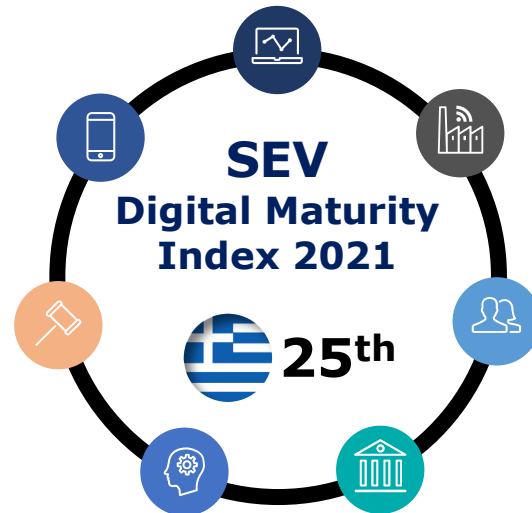
7. Public sector

		2021	2020
Score		5.5	5.2
Rank		**27/27**	**26/27**
EU average		7.1	6.7

Source: SEV Hellenic Federation of Enterprises

Initial proof of findings

SEV digital maturity index 2021 – Public sector deep dive

eGov KPIs	"Median" countries	
Online services	~ 1300	~ 1300
% of G2C / G2B services	~ 90% / 95%	~ 55%
Pre-filled forms	~ 70%	~ 35%
Other features	• G2B e-invoicing at 90% • Extended interoperability of registers and procedures • e-Justice applications • A.I. tools	Procurement in progress or Early-stage implementation

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Policy recommendations overview

- **Interoperability** remains key to efficient G2B digital services.

- **A comprehensive strategy** mix should set administrative burden reduction, organizational efficiency, regulatory simplifications, service delivery and "front-desk" digitalization as equally important objectives

- **Considerable effort** in migration planning and change management