



Accessible Dialog System for Public Service Information Provision: The Case of Transportation Card for the Disabled

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Problem

Information Phase of Public Services is:

- informal
- deficient in some cases



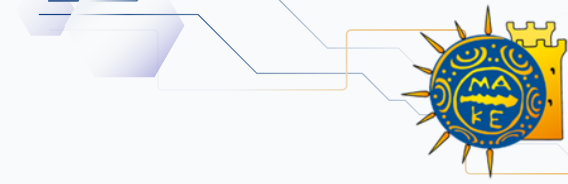
Aim of this paper is to

- Create a process for developing accessible dialog systems for public service information provision.
- Develop the system for the Case Study





Table of contents



01 Background work

02 Approach of research

03 Results

04 Process for developing the system

05 Conclusions and future work





01

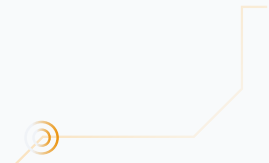
Background work



Motivation



- inGov (1/1/2021-31/12/2023)
 - 3-year Research and Innovation action funded by EU H2020 programme
- Aim
 - Enhance existing and device new Policies, Methods and Information and Communication Technology (ICT) Tools for inclusive Integrated Public Service (IPS) Co-creation and Provision



Information Phase of PS

The provision of a public service is divided into **two phases**:

- the **information** phase and
- the **execution** phase.

One of the technologies proposed to support the information phase is

- websites
- National portals
- Directories
- chatbots
- web-based dialog systems or active portal.



About the “Transportation Card for Disabled”



This card provides beneficiaries

- **reduced travel on public transport**
- **free of charge**

The traditional model of obtaining public services, such as the "Transportation Card for the Disabled," is being replaced by digital alternatives.

A pilot application has been introduced, but challenges persist, especially in the missing information phase.





***Web accessibility** refers to the ability of all individuals, including those with disabilities and older individuals, to perceive, understand, and navigate online content*

—W3C Web Accessibility Initiative (WAI)



Guidelines WCAG 2.1

There are 13 guidelines based on the 4 POUR principles (WCAG 2.1, 2023):

1. **Perceivability:**

- Guideline 1.1 Text Alternatives: e.g., large letters, braille, speech, symbols, or simpler language.
- Guideline 1.3 Adaptability: e.g., simpler layout.

2. **Operability**

3. **Understandability**

4. **Robustness**

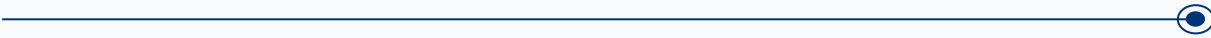
Each of these guideline lines is further analyzed into success criteria (A, AA, AAA) that define specific requirements.



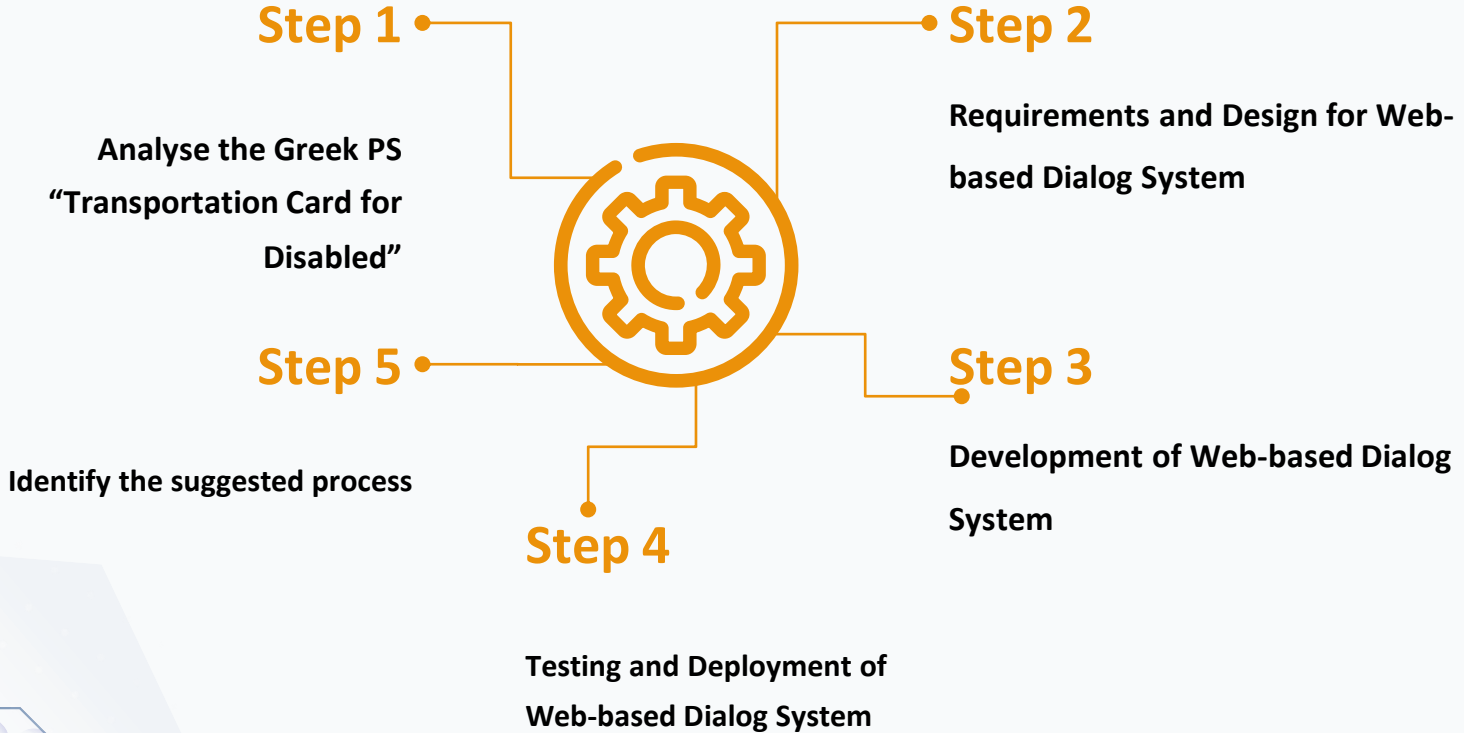


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Approach



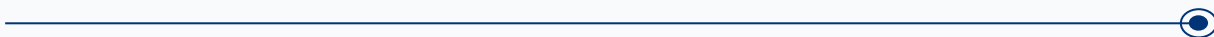
Approach





03

Results

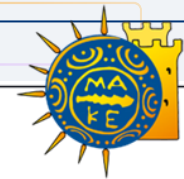




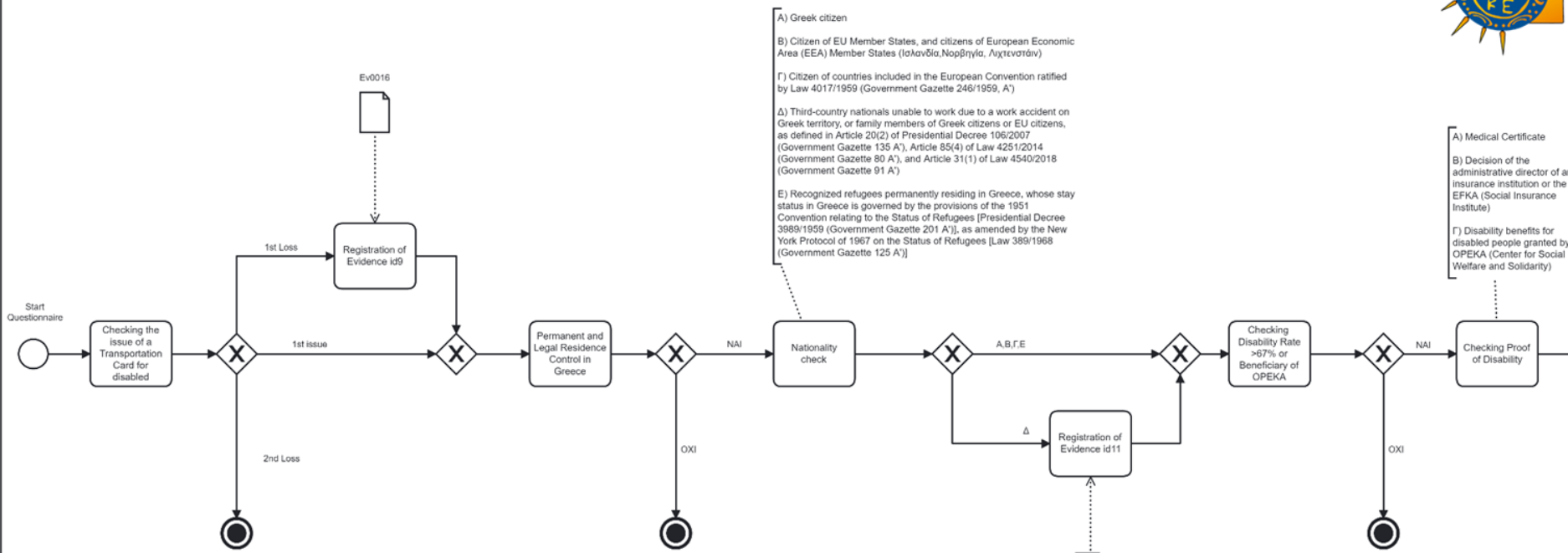
Results:

Analysis of the PS “Transportation Card for Disabled”

1. Have you renewed your Transportation Card? (**knock-out question**)
2. Are you a permanent and legal resident of Greece? (**knock-out question**)
3. Which of the following categories do you belong to? (*citizenship or residency status criteria*)
4. Do you have a disability percentage of 67% and above, or are you eligible for the privileged allowance from OPEKA? (**knock-out question**)
5. Which of the following categories do you belong to? (*Medical certificate, EFKA, OPEKA*)
6. Which of the following categories do you belong to? (*Blind, Disability rate of 80%, 67%*)
7. Declare your status below: (*Authorized person, Guardian, Cardholder*)
8. Select the mode of transportation for which you want the Transportation Card for People with Disabilities: (*For long distance only, All entitlements*)
9. Choose the category to which you belong (*Financial criteria*).

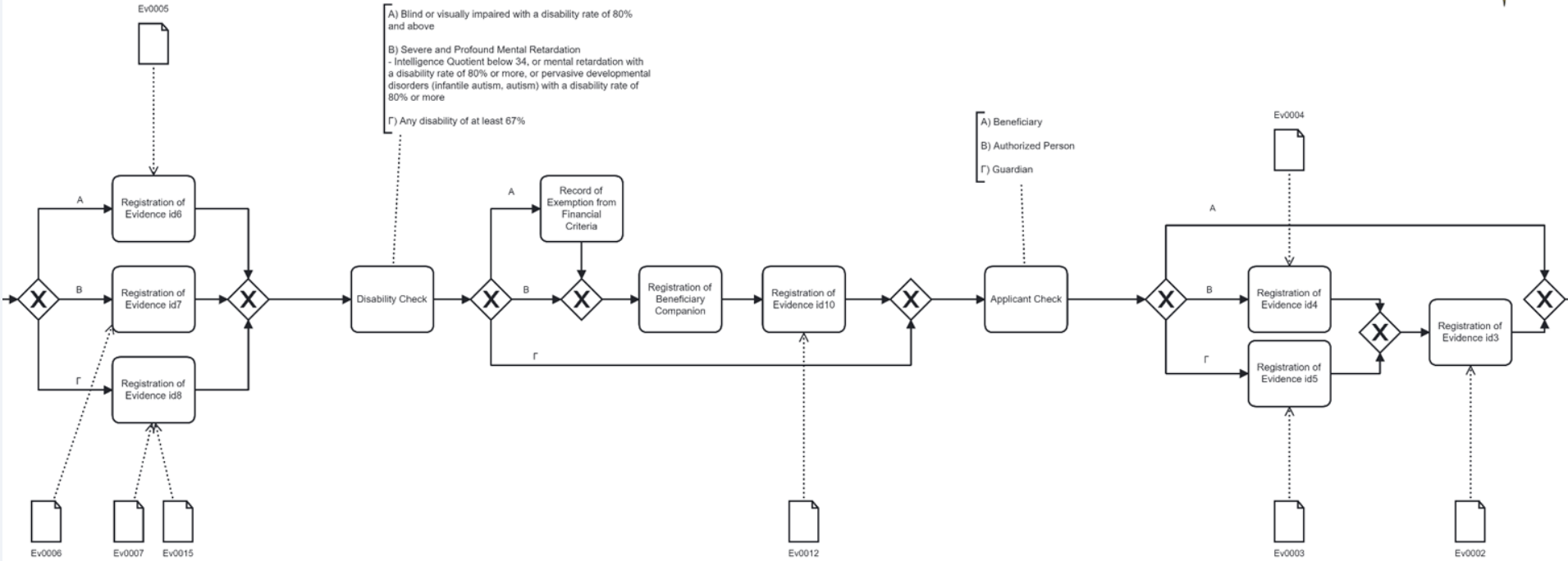


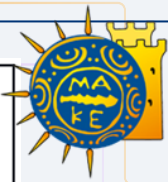
Dialog System



- A) Greek citizen
- B) Citizen of EU Member States, and citizens of European Economic Area (EEA) Member States (τοκονδίο, Νορβηγία, Λιχτενστάιν)
- Γ) Citizen of countries included in the European Convention ratified by Law 4017/1959 (Government Gazette 246/1959, A')
- Δ) Third-country nationals unable to work due to a work accident on Greek territory, or family members of Greek citizens or EU citizens, as defined in Article 20(2) of Presidential Decree 106/2007 (Government Gazette 135 A'), Article 85(4) of Law 4251/2014 (Government Gazette 80 A'), and Article 31(1) of Law 4540/2018 (Government Gazette 91 A')
- Ε) Recognized refugees permanently residing in Greece, whose stay status in Greece is governed by the provisions of the 1951 Convention relating to the Status of Refugees [Presidential Decree 3989/1959 (Government Gazette 201 A')], as amended by the New York Protocol of 1967 on the Status of Refugees [Law 389/1968 (Government Gazette 125 A')]

- A) Medical Certificate
- B) Decision of the administrative director of an insurance institution or the EFKA (Social Insurance Institute)
- Γ) Disability benefits for disabled people granted by OPEKA (Center for Social Welfare and Solidarity)

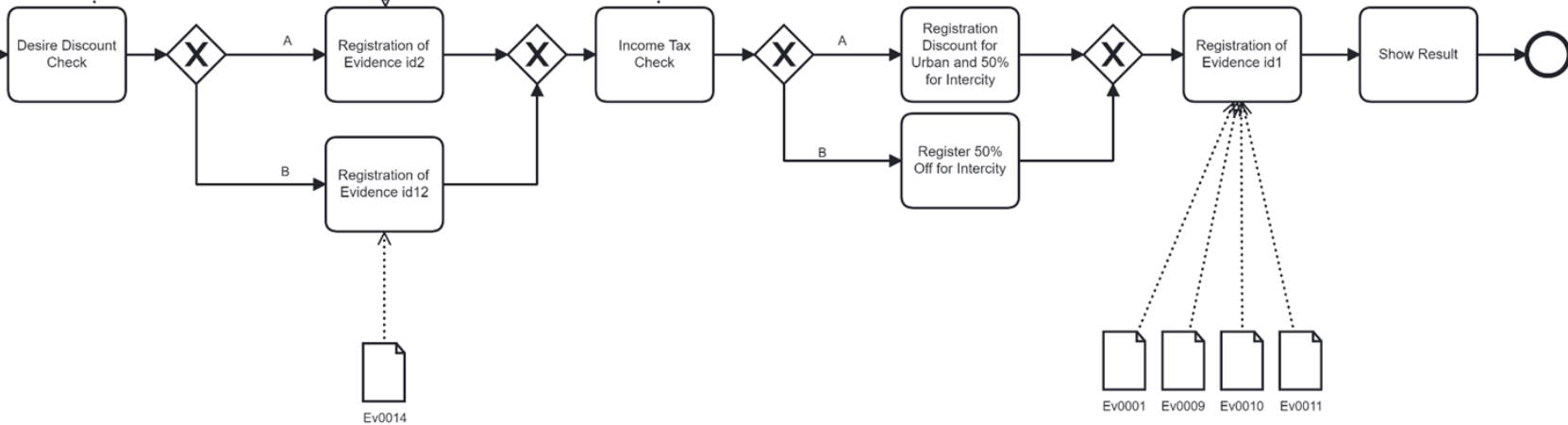




A) Discount for the Urban and Intercity Bus Service
B) Discount only for Intercity Bus Service

Ev0013

A) Individual income is less than 23,000 or family income is less than 29,000 (OPEKA income not included)
B) Individual income is greater than 23,000 or family income is greater than 29,000 (OPEKA income not included)



Supporting documents (Evidence) by category



ID	Category	Evidence	ID	Category	Evidence
id1	For all beneficiaries	Ev0001, Ev0009, Ev0010, Ev0011	id7	For those who have a Decision of the Administrative Director of an Insurance Institution or NIFA.	Ev0006
id2	For those who want to have a discount on Urban and Intercity Public Transport.	Ev0013	id8	For beneficiaries of the OPEKA preferential benefit.	Ev0007, Ev0015
id3	For those who do not submit the application themselves (the guardian or an authorized person)	Ev0002	id9	In case of loss of the transportation card for disabled persons	Ev0016
id4	For authorized applicants	Ev0004	id10	For eligible accompanying persons	Ev0012
id5	For guardianship applicants	Ev0003	id11	For non-EU nationals who have become incapacitated for work after an industrial accident on Greek territory	Ev0008
id6	For those who have a Health Committee Certificate.	Ev0005	id12	For those who do not wish to obtain the relevant ticket for the Urban bus service but only for the Intercity bus service	Ev0014





Results:

Requirements and Design

This includes functional and non-functional requirements, assumptions, use cases, and mockups to ensure an accurate, efficient, and accessible system.

The main **functional requirements** of the system are:

- a) the provision of **personalized information** through the questionnaire,
 - b) **informing** the user about the service through FAQs (Frequently Asked Questions) and
 - c) facilitating the user through the **accessibility menu**.
- 
- 

Results:

Development of Dialog System

The dialog system was developed using

- **JavaScript, HTML and CSS.**
- **Bootstrap 5 and jQuery 3.6 libraries.**
- **design system and CSS library of gov.gr, digigov-css_v0.31.0.**
- **aria-labels**





Results:

Testing and Deployment

Testing

- **Questionnaire:** depending on the user's responses, the expected results are achieved.
- **Accessibility Tools:** the reading implementation cannot be extended to mobile devices. The accuracy of reading some Greek and English words through the Web Speech API is not correct.

Deployment:

Finally, we proceeded to publish the system through the GitHub platform, a process known as deployment. We used The Github server to deploy the website.



Results:

Process for Developing an Accessible Dialog System

Select PS

Analyze PS and Record required fields based on
CPSV

Create necessary questions

Create BPMN diagram for the dialog flow

Analyse and Design the developing system

Select appropriate technologies for the system

Develop the system

Test the developed system

Evaluate the developed system



05

Conclusions and future work

Conclusions and Future Work



Key Learnings

- **Accessibility as a Foundation**
- **User-Centric Design**
- **Continuous Improvement**



Future Work

- **Augmented Accessibility Features**
- **Enhanced User Experience**
- **Refined Evaluation Framework**





Thank you for your attention!

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