

Bulgaria-Korea IT Cooperation Center

Evaluation Tool for e-Government Development

Project Report



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Contents

- Executive summary 4
- Project approach..... 5
 - eGov performance measurement best practices research 5
 - Analysis of the e-governance objectives of Bulgaria 5
 - Determine project and e-service selection criteria 5
 - Determine e-Gov evaluation KPI..... 5
 - Proposition of methodology for calculation of the KPIs 6
- Project results 7
 - General e-Government KPI 10
 - e-Government KPI from Customer Perspective..... 14
 - e-Government KPI from Internal Business Process Perspective..... 20
 - e-Government KPI from Human, Information and Organizational Capital Perspective..... 23
 - e-Government KPI from Financial Perspective 26
- Methodology for analysis of administrative services 29
- Further development of the evaluation tool 31

Executive summary

Purpose and scope. This document presents the results from the project “Development of evaluation tool (KPI) for e-Gov development” developed by the Bulgaria-Korea ITCC. The results are based on analysis of strategic documents regarding e-governance in Bulgaria and South Korea and reference key performance indicators (KPI) from South Korea, Bulgaria and countries from the European Union. The suggested KPIs are designed to measure critical e-Gov success factors (objectives). They are structured in five strategic perspectives inspired by the widely used Harvard Business School strategic management framework – Balanced Scorecard.

The KPIs from the General perspective are intended to evaluate the development of the e-government in Bulgaria as a whole.

The KPIs from the other four perspectives pertain to individual e-government projects (e.g. implementation of a new electronic administrative service for citizens). They should be used:

- For evaluation of the success of individual e-government projects;
- As a guideline for designing new e-government projects and defining their priority.

KPI Perspectives. Because the e-government exists to serve the citizens of Bulgaria, the KPIs from the Customer perspective are positioned on top of the other KPIs. Their aim is to ensure total customer satisfaction from the e-government.

The KPIs from the Internal Business Processes Perspective measure the time and cost efficiency of the business processes that deliver and support the e-government projects and services, as well as the quality of the business processes.

The KPIs from the Human, Information and Organizational Capital perspective make sure that the administration employees, ICT and organizational culture are adequate to support the achievement of the objectives of the Bulgarian e-government.

Finally, in order to achieve the desired results in the Customer, Business Process and Human, Information and Organizational Capital perspectives, the availability and efficient use of financial resources is measure by the KPIs from the Financial perspective.

Further developments. For this evaluation tool to become usable, target values for each KPI must be assigned. The calculation of some of the KPIs requires access to internal government information. Therefore the commitment of the MTITC is essential for the successful application of this evaluation tool. Finally, this report explains the importance of a methodology for selection of projects for financing in a situation with limited resources and provides a simple example of such a methodology.

Project approach

The applied project approach consisted of the following stages:

eGov performance measurement best practices research

This phase involved the research and analysis of information about best practices for evaluation of the development of e-government in the leading countries in the world – South Korea, EU member countries and the USA. The major sources of information for this stage of the process were the Coordinator of the Bulgaria-Korea ITCC and published materials from conferences of the Organization for Economic Co-operation and Development (OECD).

Analysis of the e-governance objectives of Bulgaria

Key performance indicators (KPI) should only exist if they measure relevant strategic objectives. This is why an understanding of the current state of the Bulgarian e-government and its vision for development was necessary for this project. The report generated by the first ITCC project under the management of Bojil Dobrev provided understanding of the current state of the Bulgarian e-government. An analysis of the Conception for e-governance in Bulgaria for 2011-2015 and the later published strategy of the government for the same period was carried out in order to harmonize the results of this project with the e-governance strategy in Bulgaria.

The Bulgarian e-government strategy has a clear mission and vision, as well as specific strategic objectives, which are measurable and achievable. It includes specific KPIs for every objective with concrete plan values for the end of the period (2015).

This project attempts to supplement the KPIs already proposed by the government. It concentrates on the measurement of shorter term results related to the performance of individual e-government projects.

Determine project and e-service selection criteria

This stage of the project involved the analysis of the selection criterion for e-services of the Bulgarian government. The currently applied methodology presented by the Director of e-Governance in the MTITC is considered as appropriate and is included in this report. In the end of this paper another example of methodology for project selection is provided as a suggestion for further development of this evaluation tool.

Determine e-Gov evaluation KPI

Based on the objectives for development of e-governance in Bulgaria, the best practices research carried out by the project team and the expertise of the individual team members in the field of performance evaluation, a set of objectives and KPIs was identified for the evaluation of the development of the Bulgarian e-government.

Perspectives. The suggested KPIs are structured in five strategic perspectives inspired by the widely used Harvard Business School strategic management framework – Balanced Scorecard

(BSC). The KPIs from the General perspective are intended to evaluate the development of the e-government in Bulgaria as a whole.

Because the e-government exists to serve the citizens of Bulgaria, the KPIs from the Customer perspective are positioned on top of the other KPIs. Their aim is to ensure total customer satisfaction from the e-government.

The KPIs from the Internal Business Processes Perspective measure the time and cost efficiency of the business processes that deliver and support the e-government projects and services, as well as the quality of the business processes.

The KPIs from the Human, Information and Organizational Capital perspective make sure that the administration employees, ICT and organizational culture are adequate to support the achievement of the objectives of the Bulgarian e-government.

Finally, in order to achieve the desired results in the Customer, Business Process and Human, Information and Organizational Capital perspectives, the availability and efficient use of financial resources is measured by the KPIs from the Financial perspective.

Leading/lagging indicators. The indicators are divided into lagging and leading. Leading indicators like “availability of advertising of the e-service” are proposed in order to provide expectations about the value of lagging indicators such as “e-service usage”. They can help identify possible performance problems in the strategy of the Bulgarian government and allow for taking of measures that would ensure that the strategic objectives are achieved.

Proposition of methodology for calculation of the KPIs

The data sources for the calculation of the individual KPI were identified and the units and methodology for calculation of the KPIs were specified. Because of time constraints and lack of access to internal information about administrative services there is no specific formula, but rather guidelines for the calculation of every KPI in the report. Another important aspect of the evaluation tool which remained outside the scope of this project is the definition of target values for the KPIs. We would like to work with the MTITC in Bulgaria to define target values for each KPI for the next few years. We believe that unless the plan values are proposed by the government they will not be observed by it afterwards.

Since one or several KPIs can refer to a single objective, the importance of each KPI for that objective is denoted by its respective weighting. The sum of the weights of the KPIs towards one objective must be equal to 1. In order to calculate the achievement of every objective, the weighting, the planned value and the actual value of the KPIs are required. Since not all KPIs use the same measurement unit, it is important to translate all indicators into a percentage ratio in order to evaluate the achievement of the objective. For example, if the KPI “Number of e-services / e-government projects delivered with PPP” is measured as a number, than the percentage of actual value as compared to the planned value of this indicator should be applied in the calculations.

Project results

Perspective	Strategic objective	KPI weight	Key Performance Indicator (KPI)
General	Increase paperless document workflow inside and between administrations	1	Documents / registers that have been converted to electronic
	Apply Public-Private Partnerships in the development and delivery of e-services	1	Number of e-services / e-government projects delivered with PPP
	Stimulate e-service usage	0,2	% of most highly used administrative services that are converted to e-services
		0,1	Administrative services that provide the option for electronic payment
		0,1	Increase in share of administrative fees collected electronically
		0,6	e-service usage/total service usage*100
	Inter-connectivity of the public administrations	1	Number of PAs connected to a system responding to a single entry point of electronic data input or service request (single sign-in)
Improve information security	1	Society trust in e-Gov security level	
Customer	Improve quality of e-services	0,2	Average response time per service
		0,4	Service availability
		0,2	Number of complaints received from citizens about e-service
		0,2	Detected system errors in e-service execution
	Citizen participation in the democracy processes	0,4	Accessibility of e-government services and applications
		0,3	Multichannel access to e-services

Perspective	Strategic objective	KPI weight	Key Performance Indicator (KPI)	
		0,2	Barrier-free access to desktop, mobile and web applications (for people with disabilities and special needs)	
		0,1	Availability of online public and private information regarding administrative service	
	Inclusive e-services	1	Unified and user-friendly interfaces for access to e-services	
	Reduction of time, efforts and price for usage of administrative services as well as for search and access to personal and public data	0,4	User satisfaction	
		0,1	Number of clicks to perform service	
		0,2	Increase in the usage of an e-service	
		0,3	Price reduction of the service for citizens	
	Increase citizen awareness	0,2	Availability of advertisements in "key" media	
		0,4	Knowledge of the existence of the service	
		0,4	New service users	
	Internal Business Processes	Processing time optimization	0,6	Order-to-delivery time
			0,4	Approve-to-launch time
		Reuse of existing technology and knowledge	0,5	Reuse of existing technology and knowledge
0,5			Reusing of existing infrastructure where possible	
Improve process quality		1	Average number of errors caused by data errors in the information systems	

Perspective	Strategic objective	KPI weight	Key Performance Indicator (KPI)
	Improve project management	1	Estimated labor hours to hours spent ratio (%)
Human, Information and Organizational Capital	Improve the administrative capacity	1	% of responsible employees that have passed dedicated training
	Improved security and reliability of information and integration systems and the related e-services	0,3	Decrease in duplication of data in different registries
		0,1	Availability of relevant IT security policy.
		0,1	Availability of incident and problem resolution policies and resources
		0,1	Compliance of the service process with relevant IT security policies
		0,2	Awareness of personnel of IT security policies
		0,2	Number of security breaches related to given project
	Technological neutrality	1	Available API of applications (SOA compatibility)
Financial	Planning, control and transparency of administrative costs and project management	0,2	Decrease in the cost of providing a service per customer
		0,2	Total cost saving for administrative services
		0,1	Budget increase % (central and municipal)
		0,1	Average e-Gov project budget spent ratio
		0,2	Estimated project cost to actual cost ratio (%)
		0,2	Return on project's investment (ROI)

General e-Government KPI

KPI	Documents / registers that have been converted to electronic	Type	Lagging
Category	Paperless document workflow		
Calculation	% of paper repositories and documents that have been replaced with electronic ones (Per administration, per e-gov project)		
Unit	%		
Plan value 2011			

KPI	Number of government IS used by 2 or more administrations	Type	Lagging
Category	Paperless document workflow		
Calculation	Source: Audit of administration; $100 * (\text{web-based IS} / \text{total number of IS in state institutions})$		
Unit	Number		
Plan value 2011			

KPI	Number of e-services / e-government projects delivered with PPP	Type	Lagging
Category	Apply Public-Private Partnerships in the development and delivery of e-services		
Calculation	Number of e-gov projects realized through public-private partnerships		
Unit	Number		
Plan value 2011			

KPI	% of most highly used administrative services that are converted to e-services	Type	Lagging
Category	Stimulate e-service usage		
Calculation	Statistical report showing the top administrative services by usage (both analogue and electronic)		
Unit	%		
Plan value 2011			

KPI	Administrative services that provide the option for electronic payment	Type	Leading
Category	Stimulate e-service usage		
Calculation	100 * (administrative services that offer electronic payment / total number of administrative services fees)		
Unit	%		
Plan value 2011			

KPI	Increase in share of administrative fees collected electronically	Type	Lagging
Category	Stimulate e-service usage		
Calculation	100 * (online payments of fees / total transactions for payment of fees)		
Unit	%		
Plan value 2011			

KPI	e-service usage/total service usage*100	Type	Lagging
Category	Stimulate e-service usage		
Calculation	% of service instances that are via e-services / total number of service instances. Could be applied to individual services or to all administrative services as a whole.		
Unit	%		
Plan value 2011			

KPI	Number of PAs connected to a system responding to a single entry point of electronic data input or service request (single sign-in)	Type	Lagging
Category	Inter-connectivity of the public administrations		
Calculation	Source: Ministry of Transport, Information Technology and Communication; outcomes of recent/on-going projects		
Unit	Number		
Plan value 2011			

KPI	Society trust in e-Gov security level	Type	Lagging
Category	Improve information security		
Calculation	Survey (online) showing the levels of trust from society in e-services information security		
Unit	%		
Plan value 2011			

e-Government KPI from Customer Perspective

KPI	Average response time per service	Type	Lagging
Category	Improve quality of e-services		
Calculation	The average time for loading the different pages in the transaction from administration logs verified by independent web monitoring provider.		
Unit	Time		
Plan value 2011			

KPI	Service availability	Type	Lagging
Category	Improve quality of e-services		
Calculation	Total uptime of the service transaction according to administration logs and verified by independent web monitoring provider.		
Unit	%		
Plan value 2011			

KPI	Number of complaints received from citizens about e-service	Type	Lagging
Category	Improve quality of e-services		
Calculation	Reports from providers of administrative services. Depends on the availability of channels and procedures for handling citizens' complaints about e-services.		
Unit	Number		
Plan value 2011			

KPI	Detected system errors in e-service execution	Type	Lagging
Category	Improve quality of e-services		
Calculation	100* number of detected errors with a service / total number of service instances. Source: Administration logs		
Unit	%		
Plan value 2011			

KPI	Accessibility of e-government services and applications	Type	Lagging
Category	Citizen participation in the democracy processes		
Calculation	Coverage of public access points in Bulgaria, overall development of the information society and wider access to computers and Internet, computer and digital literacy. Sources: The national statistics institute and the Ministry of Transport, Information Technology and Communication.		
Unit	%		
Plan value 2011			

KPI	Multichannel access to e-services	Type	Lagging
Category	Citizen participation in the democracy processes		
Calculation	Number of channels available for usage of e-services. Sources: The national statistics institute and the Ministry of Transport, Information Technology and Communication.		
Unit	Number		
Plan value 2011			

KPI	Barrier-free access to desktop, mobile and web applications (for people with disabilities and special needs)	Type	Lagging
Category	Citizen participation in the democracy processes		
Calculation	Survey and/or information from developers		
Unit	%		
Plan value 2011			

KPI	Availability of online public and private information regarding administrative service	Type	Lagging
Category	Citizen participation in the democracy processes		
Calculation	Audit (ad hoc)		
Unit	True/False		
Plan value 2011			

KPI	Unified and user-friendly interfaces for access to e-services	Type	Leading
Category	Inclusive e-services		
Calculation	Survey		
Unit	True/False		
Plan value 2011			

KPI	User satisfaction	Type	Lagging
Category	Reduction of time, efforts and price for usage of administrative services as well as for search and access to personal and public data		
Calculation	Survey using questionnaire with likert scale rating questions. Could be placed online on the portal where the electronic service is offered.		
Unit	%		
Plan value 2011			

KPI	Number of clicks to perform service	Type	Leading
Category	Reduction of time, efforts and price for usage of administrative services as well as for search and access to personal and public data		
Calculation	Results from testing the e-service work		
Unit	Number		
Plan value 2011			

KPI	Increase in the usage of an e-service	Type	Lagging
Category	Reduction of time, efforts and price for usage of administrative services as well as for search and access to personal and public data		
Calculation	Compared to previous period. Source - administration logs and reports.		
Unit	%		
Plan value 2011			

KPI	Price reduction of the service for citizens	Type	Lagging
Category	Reduction of time, efforts and price for usage of administrative services as well as for search and access to personal and public data		
Calculation	How has the price of the service changed with the introduction of ICT services?		
Unit	%		
Plan value 2011			

KPI	Availability of advertisements in "key" media	Type	Leading
Category	Increase citizen awareness		
Calculation	Ministry of Transport, Information Technology and Communication press relations department		
Unit	True / False		
Plan value 2011			

KPI	Knowledge of the existence of the service	Type	Lagging
Category	Increase citizen awareness		
Calculation	Survey		
Unit	%		
Plan value 2011			

KPI	New service users	Type	Lagging
Category	Increase citizen awareness		
Calculation	As a % of total e-service users. Administration logs		
Unit	%		
Plan value 2011			

e-Government KPI from Internal Business Process Perspective

KPI	Order-to-delivery time	Type	Lagging
Category	Processing time optimization		
Calculation	Order to delivery time of the service / benchmark order to delivery time for similar service. This information can be easily obtained by the logs of the ICT underlying the e-service. It would be difficult to calculate the average order to deliver time of the service before it has been automated, but information should be available in agency registers! Benchmarks will require additional research.		
Unit	Time		
Plan value 2011			

KPI	Approve-to-launch time	Type	Lagging
Category	Processing time optimization		
Calculation	Time elapsed from the decision to fund the project to the launch of the project result. Also comparing this time with Bulgaria and EU and Korean averages if available?		
Unit	Time		
Plan value 2011			

KPI	Reusing a standard reference business process model	Type	Lagging
Category	Reuse of existing technology and knowledge		
Calculation	Does new e-service adhere to existing reference business process from BG, EU or KR?		
Unit	True / False		
Plan value 2011			

KPI	Reusing of existing infrastructure where possible	Type	Lagging
Category	Reuse of existing technology and knowledge		
Calculation	Does new ICT solution use already implemented solution architecture in BG, Europe, Korea?		
Unit	True / False		
Plan value 2011			

KPI	Average number of errors caused by data errors in the information systems	Type	Lagging
Category	Improve process quality		
Calculation	Number of change requests for data entered in system by government employees		
Unit	Number		
Plan value 2011			

KPI	Estimated labor hours to hours spent ratio (%)	Type	Lagging
Category	Improve project management		
Calculation	Estimated labor hours to hours spent ratio (%)		
Unit	%		
Plan value 2011			

e-Government KPI from Human, Information and Organizational Capital Perspective

KPI	% of responsible employees that have passed dedicated training	Type	Lagging
Category	Improve the administrative capacity		
Calculation	HR Departments reports in central and local government institutions, ECDL certificates, training for development of projects proposals for EU funding and for managing e-government projects.		
Unit	%		
Plan value 2011			

KPI	Decrease in duplication of data in different registries	Type	Leading
Category	Improved security and reliability of information and integration systems and the related e-services		
Calculation	Audit of the IT architecture of the government agencies		
Unit	%		
Plan value 2011			

KPI	Availability of relevant it security policy.	Type	Leading
Category	Improved security and reliability of information and integration systems and the related e-services		
Calculation	Research required for Security policies in government. Information can be obtained from an entity responsible for performing security audits.		
Unit	True / False		
Plan value 2011			

KPI	Availability of incident and problem resolution policies and resources	Type	Leading
Category	Improved security and reliability of information and integration systems and the related e-services		
Calculation	Research required for IT service management policies in government.		
Unit	True / False		
Plan value 2011			

KPI	Compliance of the service process with relevant IT security policies	Type	Lagging
Category	Improved security and reliability of information and integration systems and the related e-services		
Calculation	Entity responsible for the quality management in state institutions		
Unit	True / False		
Plan value 2011			

KPI	Awareness of personnel of IT security policies	Type	Leading
Category	Improved security and reliability of information and integration systems and the related e-services		
Calculation	Trainings covering IT security passed by relevant personnel		
Unit	True / False		
Plan value 2011			

KPI	Number of security breaches related to given project	Type	Lagging
Category	Improved security and reliability of information and integration systems and the related e-services		
Calculation	Media articles		
Unit	Number		
Plan value 2011			

KPI	Available API of applications (SOA compatibility)	Type	Lagging
Category	Technological neutrality		
Calculation	Will be measured per project. Consult with IT experts; definition: should neither require nor assume a particular technology to be used		
Unit	Number		
Plan value 2011			

e-Government KPI from Financial Perspective

KPI	Decrease in the cost of providing a service per customer	Type	Leading
Category	Planning, control and transparency of administrative costs and project management		
Calculation	Saving of cost (labour time and material cost), saving of personnel. Requires comprehensive analysis of the service prior to digitalization.		
Unit	%		
Plan value 2011			

KPI	Total cost saving for administrative services	Type	Lagging
Category	Planning, control and transparency of administrative costs and project management		
Calculation	Comparison of total costs for administrative services per citizen with previous year period		
Unit	%		
Plan value 2011			

KPI	Budget increase % (central and municipal)	Type	Leading
Category	Planning, control and transparency of administrative costs and project management		
Calculation	% increase in budget for e-Gov (central and municipal).		
Unit	%		
Plan value 2011			

KPI	Average e-Gov project budget spent ratio	Type	Lagging
Category	Planning, control and transparency of administrative costs and project management		
Calculation	MTITC reports. Estimated project budget/average e-Gov project budget*100		
Unit	Amount		
Plan value 2011			

KPI	Estimated project cost to actual cost ratio (%)	Type	Lagging
Category	Planning, control and transparency of administrative costs and project management		
Calculation	Estimated project cost to actual cost ratio (%)		
Unit	%		
Plan value 2011			

KPI	Return on project investment (ROI)	Type	Leading
Category	Planning, control and transparency of administrative costs and project management		
Calculation	Net present value calculation of the expected positive cash flows (e.g. labour or material expenses that will be avoided minus any new expenses that will arise with the project will be used to calculate the expected cash flows). This figure should be compared to the project budget.		
Unit	%		
Plan value 2011			

Methodology for analysis of administrative services

The following statistics reveal the methodology applied by the MTITC in Bulgaria for prioritization of projects for development of the e-government for the period 2009-2011. It is an excerpt from the presentation by Valery Borisov, Director of e-Governance in the MTITC. The results from the thorough analysis of the Bulgarian administration and the state of the ICT and the administrative services are the following:

- 2143 administrative services are analyzed:
 - **1946** for the central and regional administration
 - **197** for municipal administration
- Detailed information is gathered about **685** services with high impact for society for the central and capital administration

Summarized results for the 685 high impact services for the year 2009:

- **162 administrative services** are used between **0 and 99 times**;
- **83 administrative services** are used between **100 and 499 times**;
- **94 administrative services** are used between **500 and 4 999 times**;
- **67 administrative services** are used between **5 000 and 49 999 times**;
- **38 administrative services** are used between **50 000 and 499 999 times**;
- **9 administrative services** are used more than **500 000 times**.

As a result of the analysis of the gathered information a shortlist of **415** administrative services with highest priority for realization is prepared:

- **218** for the central and regional administration
- **197** for the municipal administration

Summarized results from the expected usage of identified registers, classifiers and back office electronic administrative services:

- Expected **usage of the register** in number of administrative services:
 - **49** is used by more than **5 administrative services**;
 - **42** is used by more than **10 administrative services**;
 - **29** is used by more than **20 administrative services**;

- **16** is used by more than **30 administrative services**.
- Expected **number of transactions per annum per register**. It is calculated by adding the number of deliveries for all the services using the respective register.
 - **68** are used more than **1 000 times**;
 - **60** are used more than **10 000 times**;
 - **49** are used more than **100 000 times**;
 - **28** are used more than **1 000 000 times**.

Highest priority registers based on requests from government administrations.

1. Trade register – 37 requests
2. Bulstat register – 35 requests
3. Register of non-profit organizations – 28 requests
4. Register of the electronic administrative services – 28 requests
5. National classifier of professions and positions – 25 requests
6. Register of foreign non-profit organizations – 24 requests
7. Register of Bulgarian identity documents – 23 requests
8. National personal information database - 22 requests
9. Classifier of the economic activities - 22 requests
10. Certificate of no criminal record – 21 requests
11. Real estate register – 20 requests
12. Register of personal identification numbers – 20 requests
13. Unified classifier of the administrative-regional and regional units

Further development of the evaluation tool

In order to ensure that only the projects that contribute the most to the development of the e-government are funded, it is essential that the contribution of each individual project to the strategic objectives for e-governance is identified. This could be done by defining the strength of influence of the project on the objectives ranging from 0 to 1 as shown in Figure 1.

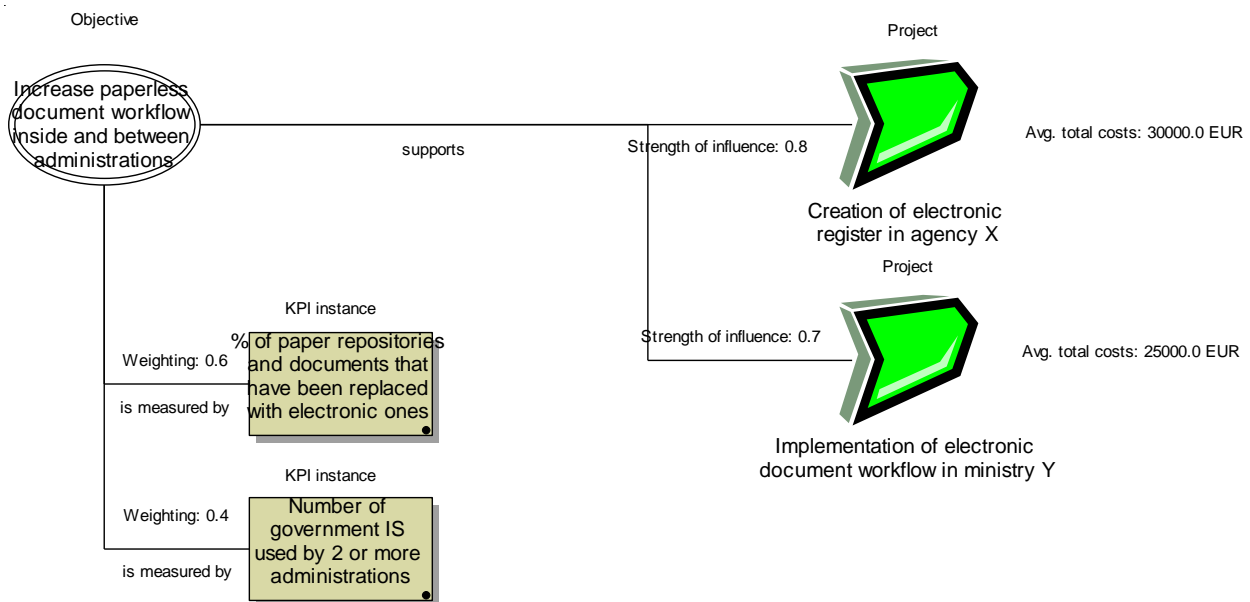


Figure 1: KPI Allocation diagram

Once the strength of influence of the projects has been identified, to maximize the total project portfolio contribution the Bulgarian government has to fund those highest priority projects that are within their budget. This methodology can be illustrated by the example on Figure 2, where the projects' priority is calculated based on their strength of influence and a priority of the objectives themselves. In this example if the government has a budget of 100,000 Euro it can fund the first top three priority projects and then use the remaining 20,000 Euro either for project 5 or find another 30,000 in order to be able to fund project 4.

Figure 2: Project prioritization based on contribution

		Strategic projects	Creation of electronic register in agency X	Implementation of electronic document workflow in ministry Y	Implementation of ITIL	Develop e-governance education courses	Project x	Project y
Strategic objectives	Performance	Prioritization						
Improve quality of e-services	1	6			0.3			
Inclusive e-services	0.84	8					0.5	
Increase paperless document workflow	0.34	3	0.8	0.7				
Processing time optimization	0.46	12	0.5	0.4	0.3			
Reuse of existing technology and knowledge	0.33	9		0.5				
Improve the administrative capacity	0.32	10			0.2	0.4		
Improved security and reliability of information and integration systems and the related e-services	0.28	11	0.5	0.5	0.6			
Planning, control and transparency of administrative costs and project management	0.21	1				0.3		
		Performance	0.64	0.727	0.67	0.19	0.42	0
		Prioritization	3	1	2	5	4	6
		Average total costs	30,000EUR	25,000 EUR	25,000 EUR	10,000 EUR	50,000 EUR	12,000 EUR

A further development of this project could be the definition of methodology for selection of e-Governance projects that is based on the contribution of the proposed projects to the strategic objectives. The benefits of this project development would be:

- maximization of the strategic results with the available financial resources
- project selection transparency
- objective criteria for projects selection that would result in increased trust from stakeholders