

NATIONAL SPATIAL DATA INFRASTRUCTURE RISK ANALYSIS

A.Kisa¹, B.Erkek², L.Özmüş³

¹General Directorate of Land Registry and Cadastre, ANKARA, TURKEY, *akinkisa@gmail.com*

²General Directorate of Land Registry and Cadastre, ANKARA, TURKEY, *berkek@tkgm.gov.tr*

³General Directorate of Land Registry and Cadastre, ANKARA, TURKEY, *lozmus@gmail.com*

Commission IV, WG IV/1

KEY WORDS: NSDI, Understanding NSDI, Risk Analysis, Stakeholders, Management

ABSTRACT:

Turkish National Spatial Data Infrastructure activities have been started by the motivation of Circular No. 2003/48 which was declared by Turkish Prime Ministry in 2003 within the context of e-Transformation of Turkey Short-term Action Plan. Action No.47 in the mentioned action plan implies that "A Feasibility Study shall be made in order to establish the Turkish National Spatial Data Infrastructure" whose responsibility has been given to General Directorate of Land Registry and Cadastre.

In 2005, by the coordination of State Planning Organization, e-Transformation Turkey 2005 Action Plan has been declared with the Supreme Planning Council decision of 2005 / 5. In that action plan, the responsibility of Action 36 with the subject of "Preliminary Works for Establishing The Turkish National Spatial Data Infrastructure" has been assigned to General Directorate of Land Registry and Cadastre. The implementation works of TR NSDI has been started with Modernization of Public Administration - 75 (KYM-75) and Geographic Information System - Infrastructure" project in 2007-2008. Finally, the service of preparing a feasibility study for the implementing Turkish National Spatial Data Infrastructure has been purchased directly from Turksat within context of the Law No. 67 of 5809 under Article.

Feasibility report of NSDI has been completed in 10th of December 2010. After decision of Steering Committee feasibility report has been send to State Planning Organization for further evaluation. This paper presents NSDI Project risk analysis which is considered in the feasibility report and related importance of understanding SDI mentality among the stakeholders.

1. INTRODUCTION

"Turkey's Information Society Transformation Policy" which was prepared with the participation of all relevant parties, has been adopted by the e-Transformation Turkey Executive Board. The policy document states Turkey's vision of transformation into an information society as follows: "To be a country that has become a focal point in the production of science and technology, that uses information and technology as an effective tool, that produces more value with information-based decision-making processes and that is successful in global competition, with a high level of welfare".

The priority areas and challenges addressed in all these information society initiatives generally focus on the following:

- Sustainable growth and increasing competitive power
- Increasing quality of life
- Eliminating digital divide
- Increasing human resource competencies and employment
- Effective provision of citizen-focused public services in multi-channel environment
- Promoting e-commerce
- Ensuring standardization and security in Information Society applications
- Creating value by developing market-oriented R&D and innovation
- Making broadband communication infrastructure commonly available.

- Enriching the content and information society applications
- Benefiting from convergence potential of technologies
- Leveraging media channels in the development of Information Society

Action KYM75- Geographic Information System Infrastructure is under the section of Modernization in Public Administration in "Turkey's Information Society Transformation Policy" document with concept of Data and Information Management.

According to this document with related to SDI mentality, Data ownership will be defined; data and information storage on digital environment will be encouraged, and main structures that will enable secure and effective information exchange within the limits of defined authorizations will be put into force so as to ensure that public agencies are able to access data and information they may need in their business processes. In this framework, duplication in data collection and storage in the public sector will be eliminated, and data integrity will be ensured.

Public agencies will adopt the principle of ensuring that citizens or enterprises do not have to provide repetitive information on the same subject, and that the service providing agency obtains necessary information from the relevant agency.

The information available to the public, which carries great significance for the society, will be shared with relevant parties to allow for new value added services. A policy will be

developed based on the principle of free sharing of information produced by public resources.

2. RISK ANALYSIS OF TURKISH NSDI

Risk analysis has been carried out as part of feasibility report of NSDI project to describe apparent risk sources in the implementation phase due to prevent or to reduce risk effects or to eliminate the risks. A risk analysis form which contains twenty five questions was prepared to investigation. Risk analysis form has been filled by project related institutional contact person clarifying in the face to face meetings.

Process of risk analysis has three phases: Preparation phase, implementation phase and evaluation phase. Risk analysis related questions prepared by results of international experiences. During the feasibility study a experienced consultant support to feasibility study and reviewed all prepared documents.

Each question has a probability and its impact as a structure and summarized risk analysis questions are shown on the below Table-1.

PROBABILITIES				
QUESTIONS	No	High	Middle	Low
Q1				
Q2				
.....				
Q25				

IMPACTS				
QUESTIONS	No	High	Middle	Low
Q1				
Q2				
.....				
Q25				

Table 1- Risk probability and its impacts structure

Summarized estimated risk analysis questions are;

1. Lack of institutional contribution?
2. Lack of Inter-agency cooperation?
3. Lack of sharing existing datasets?
4. Not to be used / preferred National portal?
5. Governance changes?
6. Turnover of staff assigned to Project?
7. Giving staff assigned to another task?
8. Duplicated data production because of lack of cooperation and coordination between agencies?
9. Lack of senior management support?
10. Unnecessarily Institutional competition?
11. Losing prestige of the project because of insignificant works?
12. Insufficient budget for proposed institution?
13. Negative decisions of managers because of changes of project needs or budget?

14. Increase cost because of Incorrect / incomplete software and hardware choices?
15. Lack of dataset production determined based on standards and quality?
16. Inadequate use of technical terms is likely to remain poor?
17. Lack of user-friendly portal interface?
18. Inadequacy to improving staff training and qualifications?
19. Insufficient network infrastructure?
20. Lack of definition of standards (contents, metadata, etc)?
21. Satisfaction of the needs by chosen software?
22. Lack of reporting/monitoring tools?
23. Rejection of purposed legislative infrastructure?
24. Occurrences of complex on authority and data?
25. Copyright problems (copying, reproduction, distribution)?

After getting all answers from the stakeholders evaluation process is done. We have some initial acceptance for evaluation. Each answer has a probability impact value as shown below (Table-2).

Ranges of values	
Probability/Impact Answers	Probability / Impact Value Range
High	0,67 - 1
Middle	0,33 - 0,67
Low	0,1 - 0,33
No	0

Table 3- Accepted initial value ranges

Sample given answers are shown following table (Table-3);

N	INSTITUTIONS	Q1 PROBABILITY	Q1 EFFECTS
1	Milli Emlak GM	Middle	Middle
2	TÜBİTAK	Middle	High
3	Sanayi Tic. Bak. KSSBK GM	Middle	High
4	TCDD	High	High
5	BOTAŞ	High	High
6	OGM	Low	High
7	Kültür Varlıkları ve Müzeler GM	Middle	High
8	İller Bankası	Middle	Middle
9	KGM	Middle	High
10	Koruma Kontrol GM	Middle	High
11	Turizm ve Yatırım İşltm GM	Low	Low
12	TAGEM	Middle	Low
13	TUIK	Low	High
14	TPAO	Middle	High
15	DSİ	Middle	High

Table 3- Sample risk analysis answers

Other results are calculated using this acceptance and number of answers. Calculated Probability Analysis Table and Impact Analysis Table are shown below (Table-4, Table-5).

Probability Analysis Table

Probability Level	Number of answers	probability multiplier	probability value
High	6	1	6
Middle	18	0.67	12.06
Low	10	0.33	3.3
No	3	0	0
Probability Values		21.36	
Probability Percentage		0.577297297	

Table 4- Probability Analysis

Impact Analysis Table

Impact Level	Number of answers	Impact multiplier	Impact value
High	28	1	28
Middle	7	0.67	4.69
Low	2	0.33	0.66
No	0	0	0
Impact Values		33.35	
Impact Percentage		0.901351351	

Table 5- Impact Analysis

Risk percentage is calculated using “**Risk = probability of threat realization x impact value of the threat to the project**” formula.

All risk categorized with their percentage and their types as administrative, technical, financial and legal. Results of evaluation, high risks of Turkish NSDI are shown following table (Table–6) in there categories as administrative, financial and legal issues.

Risk No	Probability Percentage	Impact Percentage	Risk Percentage	Risk Level
3	0.76	0.88	0.67	HIGH
11	0.85	0.86	0.73	HIGH
14	0.85	0.8	0.68	HIGH
24	0.75	0.89	0.67	HIGH

No	Risk Type	Risk (Threat)
3	ADMINISTRATIVE	lack of sharing existing datasets
11	ADMINISTRATIVE	losing prestige of the project because of insignificant works
14	FINANCIAL	increase cost because of Incorrect / incomplete software and hardware choices
24	LEGAL	occurrence of complexion on authority and data

Table 6- High risks of Turkish NSDI

3. RESULTS

Turkish NSDI has twenty five risks. Four risks is high level, twenty risks are in middle level and one risk in low level. Two of four high level risk is in administrative, one is financial and one is in legal issues. All technical risk are in the middle level risk.

This risk analysis shows us that NSDI is not only technical issue but also administrative, financial and legal issues. According to our risk study the administrative topic is very important. Understanding of NSDI in the ministry level, institutional level and management level within the whole stakeholders will play very important role during the implementation phase of NSDI.