Distr.: General
13 April 2012

ENGLISH ONLY

Economic Commission for Europe

Inland Transport Committee

Working Party on Customs Questions affecting Transport

Informal Ad hoc Expert Group on Conceptual and Technical Aspects of Computerization of the TIR Procedure

Twentieth session
Prague, 19-20 April 2012
Item 5 of the provisional agenda
Financial implications of the introduction of the eTIR international system

Draft cost-benefit analysis (part 4)

Note by the secretariat

I. Background

1. At its forty-eighth session, further to requests from the Inland Transport Committee (ITC), WP.30 and Informal Ad hoc Expert Group on Conceptual and Technical aspects of Computerization of the TIR Procedure (GE.1), the TIR Executive Board mandated the secretariat to conduct a cost-benefit analysis of the eTIR Project (TIRExB/REP/2011/48final para. 10). Consequently, taking into account the funds available in the TIRExB consultancy budget line and the task to be undertaken, the TIR secretariat requested the relevant services in the United Nations Office at Geneva (UNOG) to issue a tender. In line with the applicable United Nations procurement principles, rules and procedures, UNOG sent out a request for quotes to five companies. Two companies submitted a bid, which were evaluated. Subsequently, the contract was awarded to the qualified bidder whose bid substantially conformed to the requirements set forth in the solicitation documents and who had been evaluated as being most cost-efficient for the United Nations.

2. Considering that the cost-benefit analysis has not yet been finalised and consolidated into a single document, the various chapters are presented independently. The draft cost-benefit analysis is reproduced in the annexes of the following informal documents:

Informal document GE.1 No.6a (2012)	System Architecture alternatives
Informal document GE.1 No.6b (2012)	Costs Analysis
Informal document GE.1 No.6c (2012)	Benefits Analysis and Cost-Benefit Analysis
Informal document GE.1 No.6d (2012)	Executive summary and recommendations
Informal document GE.1 No.6e (2012)	Annex : References and applicable documents

II. Disclaimer

3. All parts of the cost-benefit analysis, including but not limited to the various assumptions on which they are based, are the sole responsibility of the authors and do not necessarily reflect the views of the UNECE secretariat. As yet, the UNECE secretariat's contribution to the analysis has been limited to ensuring that the methodologies required for a successful cost-benefit analysis have been properly applied. Considering that the cost-benefit analysis is still under review and may, possibly, be subject to further amendments, the results presented in the annex should be considered as provisional and as merely intended to brief GE.1 on the current state of play with regard to the issue at stake.

III. Further considerations

4. The GE.1 may wish to consider the part of the cost-benefit analysis as contained in the annex, provide comments or suggestions for its improvement as well as, possibly, formulate first and preliminary recommendations with regard to the most appropriate – or most realistic – option to be pursued.

Annex Executive summary and recommendations

United Nations

Economic Commission for Europe

Inland Transport Committee

Project:

Cost Benefit analysis of the eTIR system

Publication reference:

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Executive summary and recommendations

April 2012

Version: Draft-05-41

Executive summary and recommendations *

Deliverable: Phase 2:

Ref: UNECE-eTIR-CBA-SUM

Version 05-41 / 11/04/2012 – draft

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**Deliverable sent to UNECE for Acceptance.*

Revisions

Version	Rev.	Date	Description	Author	Action (*)	Chapter
01	11	31/03/2012	Update	Iacob Crucianu	U	All
05	11	06/04/2012	New estimations for costs and benefits. Risk ratio included	Iacob Crucianu	U	All
05	21	11/04/2012	Review	Siveco	U	All
05	31	12/04/2012	Review	Siveco	U	All
05	41	12/04/2012	Summary of costs benefits	Iacob Crucianu	U	2

(*) Actions: I = Insert, U = Update, D = Delete, M = Merge, C=Comments

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0.1. ISSUE CONTROL

This document has been issued by:

- SIVECO Romania SA,

We will refer to SIVECO Romania SA in the present document as **SIVECO**.

The current project: the Cost Benefit Analysis of eTIR will be referred to as **eTIR-CBA**

This document will be reviewed by UNECE and accepted.

0.2. DISTRIBUTION CONTROL

Copy No.	Name	Project Title	Company
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1. INTRODUCTION

1.1. PROJECT OVERALL OBJECTIVE

The overall objective of the eTIR-CBA project is to analyze, from a technical and financial perspective, the technical options for the implementation of the eTIR system.

The first step in accomplishing this objective is defining the architectural alternatives, which is the subject of document UNECE-eTIR_CBA-ARCH-v02-41.

The second step is an estimation of the software development costs for the eTIR international system. This is the subject of the document UNECE-eTIR_CBA-EST-v09-51.docx.

The third step is dedicated to the benefits analysis for all architectural alternatives. This is the subject of the document UNECE-eTIR_CBA-BEN-v05-31.docx. This document presents also a Return on Investment (ROI) and Cash Flow analysis.

The present document summarizes all the work executed and presents recommendations, based on the results obtained during the analysis phase.

2. EXECUTIVE SUMMARY

2.1. BACKGROUND

UNECE administers the TIR Convention, which was established in 1975 and which has 68 Contracting Parties. The Convention provides for an internationally recognized procedure for facilitating cross border transportation of goods in transit through the use of a standard, internationally recognized transit document (TIR Carnet).

For many years, the TIR Convention proved to be an effective facilitation tool. Nowadays, with the progress of technology, the use of the paper TIR Carnet seems to be obsolete, in particular when it comes to linking it to the procedures applied by the national Customs administrations.

At each border crossing, Customs officers are faced with the additional work of handling TIR Carnets in their national electronic system, often having to retype up to 50 data elements into the system, not to mention the risk due to human error.

Furthermore, this situation does not enable Customs authorities to effectively apply risk management procedures based on advanced cargo information, as it is demanded by an increasingly security-conscious environment.

In view of the above, the Working Party on Customs Questions affecting Transport (WP.30) has initiated the computerization of the TIR procedure (so-called “eTIR Project”), which aims, inter alia, at developing an information exchange platform for all actors involved in the TIR system, known as the eTIR international system.

Moreover, the introduction of the “eTIR system” also implies parallel efforts from the Contracting Parties and the Guarantee Chain to develop or update national or private systems.

The main beneficiaries of the project will be: Customs administrations of the Contracting Parties to the TIR Convention which use the TIR procedure, transport operators, using the TIR procedure on a daily basis and the international Guarantee Chains, which provides the required international guarantee cover for TIR transports.

The computerization of the TIR procedure requires the computerization of the information management by all the actors involved in the procedure. Whereas most Customs administrations and the current Guarantee Chain have already partially or totally introduced IT into their part of the TIR procedure, the functions embedded in the paper TIR Carnet are not yet computerized (IT based).

The eTIR international system will therefore be a platform allowing the management by the Customs authorities of data on guarantees and the secure exchange of data between national Customs systems related to the international transit of goods, vehicles and/or containers according to the provisions of the TIR Convention.

The eTIR international system is involved in two parts of the procedure. On the one hand, the guarantee chain will transmit information on the guarantees it has issued to the holders, so that those guarantees can be registered in the eTIR international system. On the other hand, the Customs authorities will use the eTIR international system to check the status of guarantees and to exchange information related to the TIR transport and to TIR operations.

Thus, the management by Customs of the data on guarantees and the secure exchange of data between national Customs systems in relation to TIR transport information are the two fundamental features of the eTIR international system.

The eTIR project will also provide guidelines for promoting harmonization, especially in the context of the dialogue between holder and Customs authorities (standard declarations). Communication, security and fallback solutions constitute other key features of the system.

In view of the cost-benefit analysis of introducing the eTIR system, the financial benefits brought to all the actors (stakeholders) involved are expressed as major cost-reductions in operations.

2.2. ARCHITECTURAL ALTERNATIVES

2.2.1. Alternatives to be considered

Based on the efforts already made in the eTIR Reference Model V3.0, we established in the inception phase the main architectural alternatives which will be taken into account in our analysis.

Three major alternatives, each one with several options will be considered in the evaluations of the cost-benefit analysis:

- Implementation using cloud computing concepts
  a. Infrastructure as a Service (IaaS);
  b. Platform as a Service (PaaS);
  c. Software as a Service (SaaS);
- Hosting all hardware infrastructure, hardware systems and software systems at the premises of the owner of the eTIR system and using a completely separate environment;
- Implementation using cloud computing concepts by hosting the eTIR system at the premises of other IT systems This is similar to IaaS or PaaS, but the infrastructure or the platform will be provided by a third party, e.g. UNOG (United Nations Office at Geneva) or UNICC (United Nations International Computing Centre);

From a technical point of view, the classification of solutions (the first being rated best) is the following:

PAAS;

UNOG, UNICC;

At one's own premises;

IAAS;

SAAS.

The classification is based on the criteria and marks presented below:

No	Category	IaaS	PaaS	SaaS	UNOG/ UNICC	Premises
1	24/7 Reliability (Uptime is Imperative)	4	5	5	4	3
2	Performance	4	5	3	3	2
3	Security	1	3	3	4	5
4	Scalability	4	5	2	3	3
5	Availability/Access From Anywhere	4	5	5	4	3
6	Flexibility & Customization	4	3	2	3	5
7	Mental Blocks / Culture	3	3	2	4	5
8	Administration	3	4	5	4	1
9	Maturity of technology	3	2	1	4	5
	Total	***30***	***35***	***27***	***33***	***32***

Table 1. Technical classification

2.3. COST-BENEFIT ANALYSIS

The cost analysis was made by means of taking into account a period of 2 years for the system development and setup and the following 10 years for operations and contains the following:

- Costs evaluation for the development and implementation;
- Initial costs necessary for the system setup;
- Operational costs (including cloud costs);
- Help desk costs;
- Costs necessary for connecting national customs IT system.

Costs evaluation for the development and implementation was based on the evaluation of the system dimensions, performed by using Function Point Analysis and Analogy Estimation.

The development costs are considered to be equal for all architectural alternatives, except for SAAS, where development costs have not been considered.

The risk ratio applied to costs and to benefits was considered 20%.

All costs were evaluated for two scenarios:

- Start the eTIR system for all TIR transports (Big-Bang) at once, also referred to as eTIR usage equally distributed;
- Gradual implementation of the eTIR system over a period of 10 years.

For each scenario, the architectures considered where

Premises, UNOG, UNICC, PAAS, IAAS, SAAS.

The final and consolidated results indicate that the total costs, benefits, ROI are as presented in the following chapters:

2.3.1. Cost, Benefits, ROI for system launched for all TIR Carnets from the beginning

			Premises	UNOG	UNICC	PAAS	IAAS	SAAS
Costs	**Total Dev, Operational;**							
		Development	$924,800	$924,800	$924,800	$924,800	$924,800	$0
		Initial	$1,255,000	$681,500	$632,000	$192,000	$632,000	$60,000
		Operational	$3,404,190	$1,947,390	$1,677,190	$1,591,160	$1,134,020	$15,000,000
	Total Dev, Operational;		$5,583,990	$3,553,690	$3,233,990	$2,707,960	$2,690,820	$15,060,000
	Help Desk		$1,286,300	$1,286,300	$1,286,300	$1,286,300	$1,286,300	$1,286,300
	National App		$7,006,205	$7,006,205	$7,006,205	$7,006,205	$7,006,205	$7,006,205
Total Costs			$13,876,495	$11,846,195	$11,526,495	$11,000,465	$10,983,325	$23,352,505
Total Costs (including 20% risk factor)			$16,651,794	$14,215,434	$13,831,794	$13,200,558	$13,179,990	$28,023,006
Discounted Costs			$14,830,024	$12,904,598	$12,610,927	$12,044,122	$12,131,588	$22,646,607
Benefits for Customs (including 20% risk factor)			$102,872,730	$102,872,730	$102,872,730	$102,872,730	$102,872,730	$102,872,730
Total Benefits (including 20% risk factor)			$416,130,910	$416,130,910	$416,130,910	$416,130,910	$416,130,910	$416,130,910
Discounted Customs Benefits			$75,652,948	$75,652,948	$75,652,948	$75,652,948	$75,652,948	$75,652,948
Discounted Overall Benefits			$306,024,056	$306,024,056	$306,024,056	$306,024,056	$306,024,056	$306,024,056
ROI for Customs			410%	486%	500%	**528%**	524%	234%
Overall ROI			1964%	2271%	2327%	**2441%**	2423%	1251%
Net present value			$214,622,370	$216,547,796	$216,841,468	**$217,408,272**	$217,320,807	$206,805,788

2.3.1. Cost, Benefits, ROI for system launched for eTIR Carnets distributed gradually

			Premises	UNOG	UNICC	PAAS	IAAS	SAAS
Costs	**Total Dev, Operational;**							$0
		Development	$924,800	$924,800	$924,800	$924,800	$924,800	$0
		Initial	$1,255,000	$681,500	$632,000	$192,000	$632,000	$60,000
		Operational	$2,210,000	$1,190,000	$850,000	$1,020,000	$680,000	$8,500,000
	Total Dev, Operational;		$4,389,800	$2,796,300	$2,406,800	$2,136,800	$2,236,800	$8,560,000
	Help Desk		$1,286,300	$1,286,300	$1,286,300	$1,286,300	$1,286,300	$1,286,300
	National App		$7,006,025	$7,006,025	$7,006,025	$7,006,025	$7,006,025	$7,006,025
Total Costs			$12,682,125	$11,088,625	$10,699,125	$10,429,125	$10,529,125	$16,852,325
Total Costs (including 20% risk factor)			$15,218,550	$13,306,350	$12,838,950	$12,514,950	$12,634,950	$20,222,790
Discounted Costs			$12,176,220	$10,706,503	$10,374,647	$10,022,078	$10,236,332	$14,877,363
Benefits for Customs (including 20% risk factor)			$31,094,545	$31,094,545	$31,094,545	$31,094,545	$31,094,545	$31,094,545
Total Benefits (including 20% risk factor)			$235,807,515	$235,807,515	$235,807,515	$235,807,515	$235,807,515	$235,807,515
Discounted Customs Benefits			$21,082,654	$21,082,654	$21,082,654	$21,082,654	$21,082,654	$21,082,654
Discounted Overall Benefits			$159,881,683	$159,881,683	$159,881,683	$159,881,683	$159,881,683	$159,881,683
ROI for Customs			73%	97%	103%	**110%**	106%	42%
Overall ROI			1213%	1393%	1441%	**1495%**	1462%	975%
Net present value			$97,727,915	$99,197,632	$99,529,488	**$99,882,057**	$99,667,804	$95,026,772

3. RECOMMENDATIONS AND CONCLUSIONS

Considering the technical characteristics and the performed cost-benefits analysis, our recommendations are:

A. It is better to implement eTIR as soon as possible, in order to increase the benefits it can offer.
B. Given the cost-benefit analysis above, we can classify the architectural alternatives, in their order of importance:
    1. Implementation of eTIR using Microsoft PaaS (ranks first from a technical point of view and from the ROI point of view)
    2. Implementation of eTIR using UNICCIT services (ranks 2nd/3rd from a technical point of view and 2nd from the ROI point of view)
    3. Implementation of eTIR using UNOG IT services(ranks 2nd/3 rd from a technical point of view and 3 rd from the ROI point of view)
C. Looking at the cost aspect, the gradually implementation scenario seems most convenient alternative.
D. The "Big-Bang" approach (using eTIR for all TIR transports from the beginning) is the most profitable scenario when considering ROI.

The benefits of implementing the eTIR system are very important for all the actors involved in the eTIR procedure: Customs, which benefit from reducing the processing time for each TIR operation, the Guarantee chain which benefits from working in a paperless environment and traders, who benefit from the reduced time to fill in TIR Carnets and to have them processed by Customs.

Moreover, the implementation of the eTIR system offers benefits also to all Customs authorities, offering them multiple possibilities for risk management based on advance cargo information, thus considerably reducing the risk of fraud.

In conclusion, we consider that it is very important for the overall success of the project, tha all actors involved in the eTIR project commit themselves fully to its integral implementation from the very beginning.

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