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**IMPACTOUR**  
**IMproving Sustainable Development Policies and**  
**PrActices to assess, diversify and foster Cultural**  
**TOURism in European regions and areas**



## **D6.1 – IMPACTOUR Tool validation methodology**

**Deliverable Lead and Editor:** CUT

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### **Abstract**

This deliverable describes the IMPACTOUR tool validation methodology, which is to determine the outcome variables of interest and prioritize them based on their relative importance.

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### Further Information

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## Project Partners



For full details of partners go to [www.impactour.eu/partners](http://www.impactour.eu/partners).

## **Executive Summary**

In the context of this report, an inclusive pilots' validation and evaluation methodology has been developed and proposed. The evaluation methodology has been studied extensively and defined in complete detail, as it provides valuable remarks and conclusions about the actual value, quality, the viability and the potential sustainability of the IMPACTOUR tool. The work accomplished in the previous WPs such WP2 up to WP5, as well as the defined KPIs have provided the main input for the needs of WP6 and in particular of this deliverable.

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## 0 IMPACTOUR Project Overview

IMPACTOUR – Improving Sustainable Development Policies and Practices to assess, diversify and foster Cultural TOURism in European regions and areas – is a project funded by the H2020 Framework Programme of the European Commission (EC) under Grant Agreement 870747 and conducted from January 2020 until June 2023. It engages 12 partners from 10 European countries with a total budget of 2,971,250.00 euro. Further information can be found at [www.impactour.eu](http://www.impactour.eu).

The main ambition of the IMPACTOUR project is to create an innovative and easy-to-use methodology and tool, to measure and assess the impact of cultural tourism (CT) on European economic and social development, and to improve Europe's policies and practices on CT, thereby strengthening its role as a sustainable driving force in the growth and economic development of European regions.

CT has been recognized as one of the drivers of growth, jobs and economic development, as well as intercultural understanding and social development in European regions and urban areas. However, there is still a knowledge gap on methods to measure the impact of CT, to assess multilevel and cross-border strategies, policies and practices which contribute to sustainable development. IMPACTOUR proposes to bring together CT-related stakeholders and researchers to achieve new approaches, taking advantage of the large amounts of information that confront policymakers.

By identifying and comparing quantitative/qualitative pan-European information on CT forms and its promotion, and by providing quantifiable evidence of CT strategies and their effect on European regions' development and Europeanisation, IMPACTOUR will deliver an innovative methodology and tool. Combining data analytics algorithms with artificial intelligence and machine learning strategies will provide CT stakeholders with strategic guidance so that policies and practices on CT can be improved.

IMPACTOUR will encompass a sustainable ecosystem by engaging cultural tourism stakeholders and following a participatory approach. IMPACTOUR tools and methods will lead to reinforcing the commitment with European CT, increasing citizens' sense of belonging, valorisation of minority cultures, and strengthening identities and Europeanisation.

### 0.1 Deliverable Purpose and Scope

The main scope of the deliverable is to define and elaborate the Pilots' validation and evaluation methodology. The final thirty (30) Pilots played a key role on the research and development activities leading to IMPACTOUR procedure and tool. At the beginning of the project nineteen (19) pilots have been considered in the contract. other eleven (11) important pilots have been entered already in the online tool, due to their significance. This was necessary and useful to extend the existing pilots and build a more representative community of the variety of European cultural tourism destinations as listed:



Figure 1 - IMPACTOUR Methodology

- Almada (Portugal),
- Basilicata region – *Matera* (Italy),
- Borgata Paralup (Italy),
- Camino de Santiago – Castle and León (Spain),
- Capital City Magdurg (Germany),
- Cascais (Portugal),
- Chemin de Compostelle en Aveyron (France),
- Corvo Island, (Portugal),
- Fajã dos Cubres (Portugal),
- Kyperounta (Cyprus),
- Lagoa das Furnas (Portugal),
- Municipio 2 Milano & CPM (Italy),
- Murgia National Park (Italy),
- Museo de Pontevedra (Spain),
- Palentian Romanesque (Spain),
- Palmi, Calabria (Italy),
- Pico Island (Portugal),
- Rab (Croatia),
- Rota de Romanico (Portugal),
- Sao Jorge Island (Portugal),
- Sao Miguel Island (Portugal),
- Strasse der Romanik (Germany),
- Tartu (Estonia),
- Terceira Island (Portugal),
- Trebinje (Bósnia-Herzegovina),
- Trikala (Greece),
- Vidzeme (Latvia),
- Val Camonica Rupestrian Art Route / *ValCamonica* (Italy),
- Voie d'Arles (France) and
- Võru County (Estonia).

Moreover, for their better comparison and understanding (see D2.2 Comparative Assessment Report), these destinations have been divided into groups considering their characteristics and similarities, according to the types of Lands (Urban, Rural, Itinerl, Natural, see also D3.4 - **chapter 3.1.1 pilots involved** - Page 21/117):

1. **RURALIA:** Tartu County, Võru County, Kyperounta and Palentian Romanesque.
2. **URBANALIA:** Almada, Cascais, Milano Periphery and Museum of Pontevedra.
3. **ITINERLALIA:** Camino de Santiago, Chemin d'Arles, Chemin d'Aveyron, Strasse der Romanik, Rota do Românico.
4. **NATURALIA:** São Miguel Island, Corvo Island, Faja dos Cubres, Lagoa das Furnas, Pico Island, São Jorge Island, Terceira Island.

## 0.2 Target Audience

This document aims primarily to define the IMPACTOUR tool validation methodology and it's designed to be used by the:

1. Twelve consortium partners,
2. IMPACTOUR pilots. These were initially 19 destinations, however, due to the needs and requirements of the project partners, and the consequences resulting from the Covid-19 pandemic, these pilot destinations have been supplemented by the additional pilot destinations as referred above. All pilots have been reviewed, using a survey questionnaire, in order to assess their degree of alignment with the IMPACTOUR objectives and their capacity for providing appropriate data to the project. Their active participation is a key element to achieve a good final and of high-quality result and, due to a series of webinars and on-line meetings held during 2020, a strong partnership has been established between the beneficiaries and the pilot destinations (i.e. MATERAHub beneficiary with the Basilicata region, *Matera, Comune di Palmi, Sassi di Matera* and *Parco Murgia* in Italy, and/or AMRAA beneficiary with *São Miguel Island, Aldeia dos Biscoitos, Aldeia das Sete Cidades, etc.* - see also, table 4.2 in deliverable 3.2 page 34/58). Once the tasks for each pilot have been defined, it was the representatives of each pilot destination who were responsible for contacting *the agents* within their area of action, in order to establish work strategies and obtain the desired information (i.e. metadata). To this end, the design of the collaborative mapping of *the stakeholders* becomes a reference support for the detection of those *agents* that are most relevant in each example.
3. IMPACTOUR stakeholders (agents within each destination), who provided important information to the project.
4. Other important and interested users and stakeholders, such as public authorities or site managers.

### 0.3 Document Status

D6.1 – IMPACTOUR tool validation methodology is listed in the Description of Action as “public” since it provides information for project external usage too.

# 1 Introduction

In the domain of software engineering and modelling, the assurance of model validity is a prominent challenge. Several contributions concerning validation tests and their epistemological foundations have been developed. In our case validation testing is the practice of ensuring that software meets the quality standards set by the consortium and that the tool meets users' requirements. It is one of many different types of testing in software. However, the proposed Validation methodology will be called acceptance testing because it's defining the finishing of the software development and testing phases (writing code). In this sense, we are defining the process of verifying if the IMPACTOUR tool can be accepted based on certain criteria or requirements that are defined in advance in several consultations with the different stakeholders, the advisory board, and all the project's pilot users.

Businesses often perform validation testing as part of their Software Development Life Cycle (SDLC), code review being a key element to ensure that software works as intended and does not contain defects, bugs, or logical errors.

The IMPACTOUR validation and evaluation methodology guarantees that the tool is ready for release and meets the stakeholder's (pilots) expectations – so it is important to get it right. But *how do you know when you're done? What does IMPACTOUR validation methodology mean? How does this differ from verification testing?* and, most importantly, *how do you do it?*

Moreover, a pilot recorded data and information quality are basic conditions to determine the efficiency of a software system and further assess missing information and/or high quality of metadata and data. The analysis of the data quality recorded by the IMPACTOUR evaluation system is a basic task to discriminate between correct and erroneous (or questionable) data. This task not only allows the detection of incorrect or questionable data, but also to ignore and replace it with a good estimation to maintain a complete and reliable tool database, especially the IMPACTOUR machine learning Tool. This novel IMPACTOUR app is an integrated separate software module, which archives data (over time) from all different users and pilots. This will allow calculating the compared values of KPIs-not only with the users' baseline (AS IS) data but also with the historical average data from all users.

## 2 The IMPACTOUR Verification Methodology

In this section, we are proposing the different stages of development for the validation process, which are the high-level steps that support the validation of the testing activities.

These steps are used as a guideline for developing our acceptance testing process and setting our verification methodology. In this way it is clear that with a well-defined procedure (WP3, WP4 and WP5) and solid IMPACTOUR tool, we save our stakeholders and users time and help them have a greater return on investment (ROI).

### 2.1 Stages of Validation Testing Process

For the validation methodology we are proposing the following steps:

#### 2.2 Validation Planning

This is the project-specific plan that defines the scope and goals of our validation methodology. This is a high-level planning for our tool and pilots' validation.

#### 2.3 Define Requirements

We need to establish a set of requirements to work toward, which will stipulate what information (metadata) and data / parameters our pilots should include and how those features should work. This defines the test criteria, which is essential for validation and evaluation.

#### 2.4 Selecting a Team

A well experienced and competent user team has to be in place (CT specialists together with those stakeholders/agents in charge of the pilots – see also D3.2 Table 4.2 p34/58).

#### 2.5 Developing Documents

Development of user-specifications document, where the users are describing their current, mid- and long-term goals, investments, developments and operating conditions for their pilots. These documents have to be in line with the local, regional, international and pan-European policies in investments and directives (such as the [UNESCO guidelines for the protection and preservation of world heritage sites](#)).

#### 2.6 Definition & Verification of Data

Collecting and verifying the pilot's meta- and data records (included in the Main Menu/Site Visualisation in the IMPACTOUR tool: official international pilot's name, country, description, location, etc.) and if operates as originally intended and submit a validation report.

#### 2.7 Issue Tracking and Performance Optimisation

Updating of the IMPACTOUR tool to address any software errors, bugs or performance issues found during the evaluation process. This will also include the incorporation of change requests by policymakers where there is a clear benefit to the tool and the user experience.

The validation process will also include functionality testing such as performance qualification: User Acceptance Testing (UAT) – Alpha and Beta testing and finally,

## 2.8 Production

When the IMPACTOUR tool passed the “waterproof” quality test, is put into production and high-quality data records of pilots are available for use.

## 3 Body of Work

### 3.1 Validation Planning

We propose that a method be derived by which it is possible to manually test by brute force the results produced by the IMPACTOUR Tool. This test will examine the stated implementation of the IMPACTOUR Methodology from D4.4 and 4.2 deriving in as far as possible the parameters available and their interconnections. The resulting process will provide a set of predicated outcomes that can be stress tested against the actual output from the IMPACTOUR Tool.

In order to test the predicted outcomes against the actual outcomes the validation process will engage with the pilot programmes to test the validity of the results against the prediction and allow potential anomalies to be highlighted and sent for investigation to the development team.

### 3.2 Define Requirements

In order to start the process of validation the IMPACTOUR tool the previous WP deliverables were reviewed to ensure that the current state of the application is clarified and understood.

#### 3.2.1 Known Variables

##### Types

There are 4 Types of Cultural Heritage Destination (CHD) which the user may define their site. The user may make one selection for their CTD. This is selected by the user from Decision Support System (DSS) filtering screen. These are in D4.4 p12 as: 1. Urban, 2. Rural, 3. Natural and 4. Itinerary.

##### Activities

There are 4 Cultural Activities which the user may assign to their CHD to best describe the basis of the CT at the site. The user may make one selection for their CTD. This is selected by the user from DSS Filtering screen. These are defined in D4.4 p12 as: 1. Cultural, 2. Experience, 3. Agricultural, and 4. Natural.

##### Tourist Impact

There are 8 Tourist Impacts that the user may select to describe the current effect of tourism on the CTD. The user may choose up to three Impacts of concern in regard to their CTD (or in the case of no tourist activity just one). These are selected by the user from DSS filtering screen. These are defined in D4.4 p12 as:

1. No tourism activity.
2. Tourism activity but no Cultural Tourism.
3. Over tourism
4. Seasonal tourism.
5. The touristic activity directly damages cultural heritage.
6. Unbalanced impact of tourism.
7. Highly dependent of international tourism.
8. Lack of knowledge about cultural tourism impact.

## Objectives

There are 12 Objectives available to the user to determine which strategies are recommended to work towards Sustainable Cultural Tourism (SCT). The user may select up to three objectives for their CTD to explore with the IMPACOUT Tool. These are selected by the user from DSS Filtering screen. These are defined in D4.4 p14-15 and illustrated in Figure 2.

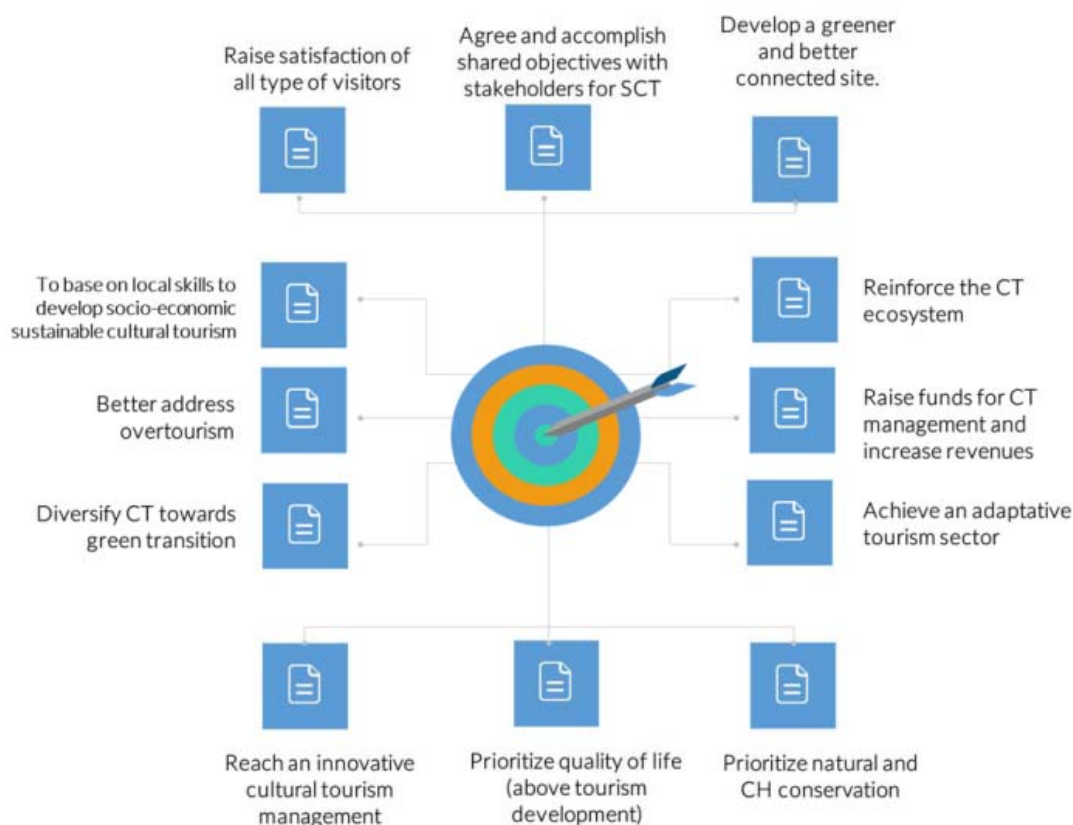


Figure 2 - Objectives Towards Sustainable Cultural Tourism

## Strategies

There are 11 Strategies within the IMPACTOUR Tool which are presented to the user as recommendations for addressing their stated CTD requirements. The Strategies are displayed in order of rank appropriate to the information provided by the user in the Filtering and Prioritization screens (informed by the based data for the five domains in the Data Input section). The user may select up to three of the available Strategies, although the three highest ranked items are highlighted to assist the user. These are selected by the user in the DSS Strategies Screen. These areas are defined in D4.3 p13 as:

1. Arts & Heritage (Enhancing the protection and vitality of tangible and intangible cultural assets)
2. Data (Building coherent evidence base and data management)
3. Skills (Developing skills and competences across the ecosystem)
4. Awareness (Raising public awareness)
5. Promotion (Promoting cultural tourism and managing overtourism collaboratively and responsibly)

6. Accessibility (Implementing universal accessibility and inclusion, and increasing connectivity)
7. Networks (Developing networks and clusters within the tourism sector, with local communities and other sectors)
8. Business (Developing cultural tourism products, services and business models based on environmental, social, and financial sustainability)
9. Digital (Enhancing digital strategies for cultural tourism)
10. Environment (Adopting environmentally sustainable practices throughout the cultural tourism value chain)
11. Policy (Implementing supportive regulatory framework for sector development and inclusive and fair labour market)

## **Actions**

In total there are 61 Actions gathered into 11 groups to address the issues raised in developing SCT by the user's selection of the Strategies. These are ranked in order of the highest associated KPI's to the least. The user may select up to three of the presented Actions to obtain a list of the KPIs associated with the chosen action(s). These are selected by the user from DSS Actions screen. The Strategies and the numbers of related Actions are as follows.

1. Arts & Heritage: 6 Actions
2. Data: 5 Actions
3. Skills: 5 Actions
4. Awareness: 5 Actions
5. Promotion: 6 Actions
6. Accessibility: 5 Actions
7. Networks: 6 Actions
8. Business: 6 Actions
9. Digital: 5 Actions
10. Environment: 6 Actions
11. Policy: 6 Actions

## **KPIs**

The IMPACTOUR methodology defined 46 KPIs for inclusion in the IMPACTOUR Tool. This number is a refinement of the previously 55 KPI identified candidates. It should be noted that three of the KPIs are split into two parts; CH 3 (CH 3.1, CH 3.2), CH 5 (CH 5.1, CH 5.2), and S 1 (S 1.1, S 1.1)

The user may access KPIs only after selecting the relevant Action via the Action Screen.

Therefore, when the parameters have been specified, we can examine how they are related to each other.

### 3.2.2 Processes

#### Basic Assumption

Using the information defined in the IMPACTOUR methodology in regard to the operation of the IMPACTOUR tool it is possible to manually check the expected results provided, given a specific set of inputs.

The base inputs are presented in Table 1

Table 1 - Table of Parameters Available

Name	Description	ID	Index	Qty
<b>Type</b>	Type of Site	<b>T</b>	i	4
<b>Activity</b>	Cultural Activity	<b>CA</b>	k	4
<b>Cultural Impact</b>	Cultural tourism Impact on the site	<b>CI</b>	m	8
<b>Objective</b>	Users Objective for the site	<b>O</b>	j	12
<b>Strategies</b>	Strategies towards SCT	<b>S</b>	n	11
<b>Actions</b>	Actions towards SCT	<b>A</b>	n/a <sup>1</sup>	61
<b>KPI's</b>	Key Performance Indicators for SCT	<b>K</b>	n/a	46

(Where i, k etc. are indexes having integer numbers with a value from 1 to qty), qty: can have value 4, 8, 11 or 12.

#### Assumption 1

The IMPACTOUR Methodology relates the selection of KPIs with three factors: Type of site, type of Cultural Activities and Strategies. All three of these must be TRUE for the selection to be made, if one or more is FALSE then the selection will be rejected. Therefore, the logic statement is:

$K = T \wedge CA \wedge S$ , as shown in Figure 3 (where  $\wedge$ , means the logical AND).

**EXAMPLE:** T Rural, CA Agricultural

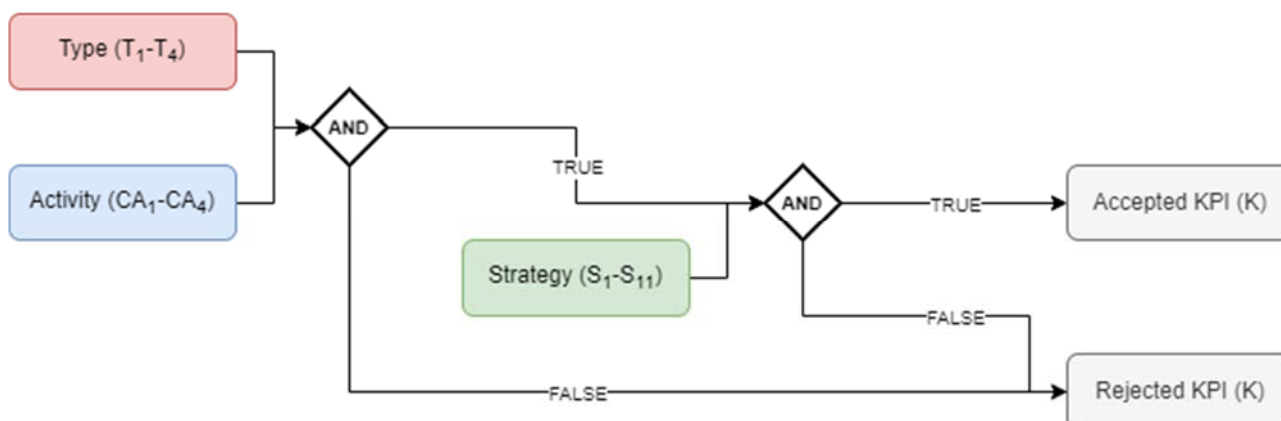


Figure 3 - Logic Diagram for  $K = T \wedge CA \wedge S$

Given that  $T \wedge CA$  must be TRUE before the logical comparison with S the combinations for  $T \wedge CA$  provide us with the first check point within out validation. The following Figure 2 shows the possible combinations for  $T_i \wedge CA_k$ .

<sup>1</sup> Not applicable



Figure 4 - Logic Tables for  $T_i \wedge CA_k$

This first pass test will determine which KPI's can be included in the test for Strategies.

**EXAMPLE:** KPI-CH10 is only applicable to Rural, Natural or Itinerary Type CTD and those with the Activity of Agricultural or Natural heritage. If the CTD is marked as Type Urban or its Activity Cultural or Experience it will be excluded from the KPI's displayed.

Table 2 -  $T_i \wedge CA_k$  Logic Test for KPI-CH10

$T_i \wedge CA_k$	CA	1 Cultural	2 Experience	3 Agricultural	4 Natural
T	State	FALSE	FALSE	TRUE	TRUE
1 Urban	FALSE	0	0	0	0
2 Rural	TRUE	0	0	1	1
3 Natural	TRUE	0	0	1	1
4 Itinerary	TRUE	0	0	1	1

Table 3 shows those KPIs that fail the initial  $T_i \wedge CA_k$  test and therefore should never appear in the KPI listing for a site (KPI-CH10 is highlighted in bold).

Table 3 - Rejected KPIs based on the  $T_i \wedge CA_k$  test

Test	Rejected KPIs
$T_1 \wedge CA_1$	KPI-CH3.2, KPI-CH5.2, <b>KPI-CH10</b> , KPI-S1.2, KPI-ENV2, KPI-EC2, KPI-EC10
$T_1 \wedge CA_2$	KPI-CH3.1, KPI-CH3.2, KPI-CH5.1, KPI-CH5.2, <b>KPI-CH10</b> , KPI-S1.1, KPI-S1.2, KPI-EC2, KPI-EC8, KPI-EC10
$T_1 \wedge CA_3$	KPI-CH3.1, KPI-CH3.2, KPI-CH5.1, KPI-CH5.2, <b>KPI-CH10</b> , KPI-S1.1, KPI-S1.2, KPI-S4, KPI-C3, KPI-C5, KPI-C6, KPI-C7, KPI-ENV5, KPI-EC2, KPI-EC8, KPI-EC9
$T_1 \wedge CA_4$	KPI-CH3.1, KPI-CH3.2, KPI-CH5.1, KPI-CH5.2, <b>KPI-CH10</b> , KPI-S1.1, KPI-S1.2, KPI-C2, KPI-C6, KPI-ENV5, KPI-EC2, KPI-EC8
$T_2 \wedge CA_1$	KPI-CH3.1, KPI-CH3.2, KPI-CH5.1, KPI-CH5.2, <b>KPI-CH10</b> , KPI-S1.1, KPI-S1.2, KPI-C3, KPI-ENV2, KPI-EC8, KPI-EC10
$T_2 \wedge CA_2$	KPI-CH3.1, KPI-CH5.1, <b>KPI-CH10</b> , KPI-S1.1, KPI-C3, KPI-EC8, KPI-EC10
$T_2 \wedge CA_3$	KPI-CH3.1, KPI-CH5.1, KPI-S1.1, KPI-S4, KPI-C3, KPI-C5, KPI-C6, KPI-C7, KPI-ENV5, KPI-EC8, KPI-EC9
$T_2 \wedge CA_4$	KPI-CH3.1, KPI-CH5.1, KPI-S1.1, KPI-C2, KPI-C3, KPI-C6, KPI-ENV5, KPI-EC8
$T_3 \wedge CA_1$	KPI-CH3.1, KPI-CH3.2, KPI-CH5.1, KPI-CH5.2, <b>KPI-CH10</b> , KPI-S1.1, KPI-S1.2, KPI-C2, KPI-C6, KPI-ENV2, KPI-EC8, KPI-EC10
$T_3 \wedge CA_2$	KPI-CH3.1, KPI-CH5.1, <b>KPI-CH10</b> , KPI-S1.1, KPI-C2, KPI-C6, KPI-EC8, KPI-EC10
$T_3 \wedge CA_3$	KPI-CH3.1, KPI-CH5.1, KPI-S1.1, KPI-S4, KPI-C2, KPI-C3, KPI-C5, KPI-C6, KPI-C7, KPI-ENV5, KPI-EC8, KPI-EC9
$T_3 \wedge CA_4$	KPI-CH3.1, KPI-CH5.1, KPI-S1.1, KPI-C2, KPI-C6, KPI-ENV5, KPI-EC8
$T_4 \wedge CA_1$	KPI-CH1, KPI-CH3.1, KPI-CH3.2, KPI-CH5.1, KPI-CH5.2, KPI-CH7, <b>KPI-CH10</b> , KPI-S1.1, KPI-S1.2, KPI-ENV2, KPI-EC2, KPI-EC8, KPI-EC10
$T_4 \wedge CA_2$	KPI-CH1, KPI-CH3.1, KPI-CH5.1, KPI-CH7, <b>KPI-CH10</b> , KPI-S1.1, KPI-EC2, KPI-EC8, KPI-EC10
$T_4 \wedge CA_3$	KPI-CH1, KPI-CH3.1, KPI-CH5.1, KPI-CH7, KPI-S1.1, KPI-S4, KPI-C3, KPI-C5, KPI-C6, KPI-C7, KPI-ENV5, KPI-EC2, KPI-EC8, KPI-EC9, KPI-EC10
$T_4 \wedge CA_4$	KPI-CH1, KPI-CH3.1, KPI-CH5.1, KPI-CH7, KPI-S1.1, KPI-C2, KPI-C6, KPI-ENV5, KPI-EC2, KPI-EC8, KPI-EC10

## Assumption 1a

Given that  $K=(T \wedge CA) \wedge S$  only those passing the initial  $T_i \wedge CA_k$  test can be prompted for evaluation against the Strategies. As each Strategy has a binary relationship with a KPI (detailed in D4.4 Annex H p31-41 as a binary mask) these can be tested for their validity.

**EXAMPLE:** Using our previous example for KPI-CH10 only Strategies 1, 4, 5, 8, 10 and 11 are valid, these can be mapped out into a truth table shown in Table 4 below.

Table 4 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH10

KPI-CH10		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE	TRUE
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_2 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_3 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_4 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	0	1	1

Pass: 36. Fail: 30. Rejected: 110.

### Note

- A one (1) on the table indicates that both the  $T_i \wedge CA_k$  test and the Strategy are TRUE and that the test has passed and the KPI is valid for display to the user.
- Zero (0) indicates that Strategy is incompatible with the Type of CTD selected and the test has failed.

- An X indicates that the  $T_i \wedge CA_k$  test has failed and the KPI should not be shown to the user.

A complete list of these relations can be found in Annex B Table 7 to Table 52.

Having explored both parts of this initial assumption we can proceed to the selection of our desired strategy in the DDS Strategy screen in the IMPACTOUR Tool to complete the logic test stated in D4.4 to access the KPI's and Actions for the CTD.

## Assumption 2

All KPIs are associated with a Strategy. Using the  $(T_i \wedge CA_k) \wedge S$  test we can confirm the links between the KPIs and the strategies. These relationships can be mapped visually for a clearer understanding of the complexity as demonstrated in Figure 5 - Figure 10.

**EXAMPLE:** Using KPI-CH10 as an example, we can see in Figure 5 the KPI connections to Strategies 1, 4, 5, 8, 10 and 11 (shown in thicker lines).

In the following figures KPIs are grouped as CH (Characterization KPI), R (Resilience KPI), S (Social KPI), C (Cultural KPI), ENV (Environmental KPI) and EC (Economic KPI).

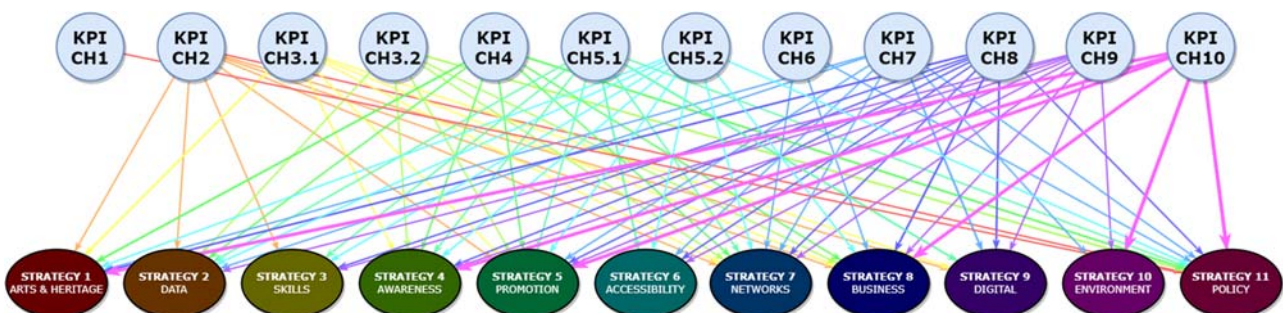


Figure 5 - Applicability of CH KPIs according to Strategy

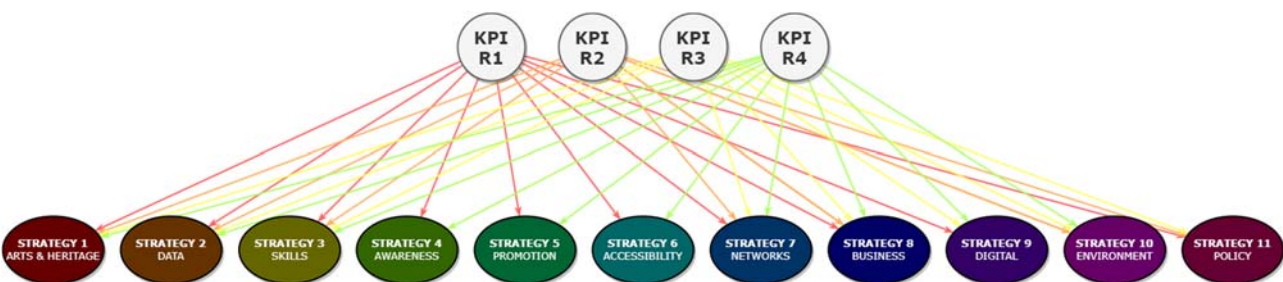


Figure 6 - Applicability of R KPIs according to Strategy

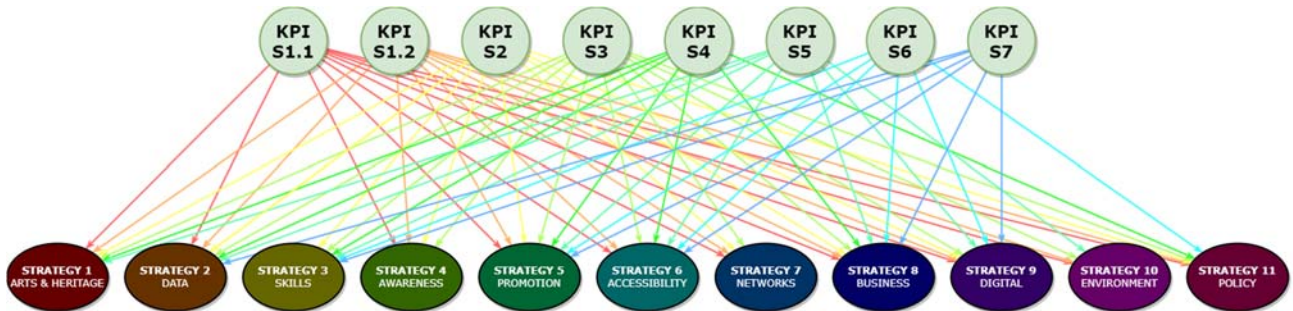


Figure 7 - Applicability of **S** KPIs according to Strategy

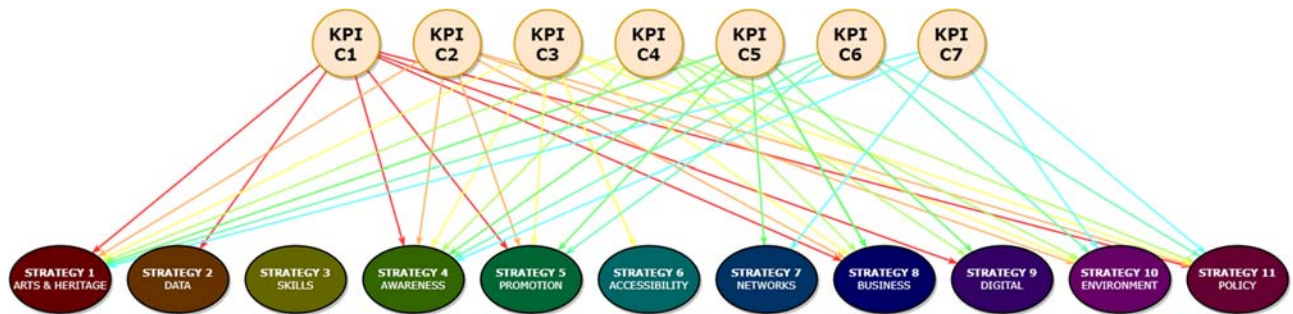


Figure 8 - Applicability of **C** KPIs according to Strategy

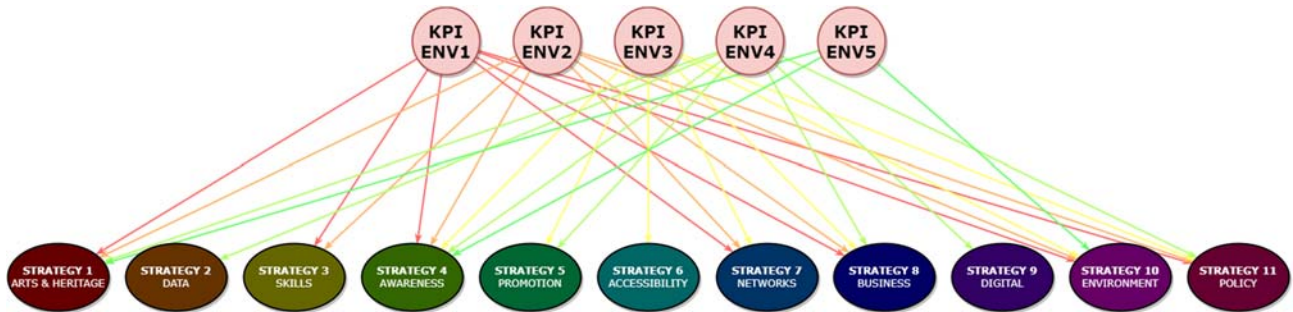


Figure 9 - Applicability of **ENV** KPIs according to Strategy

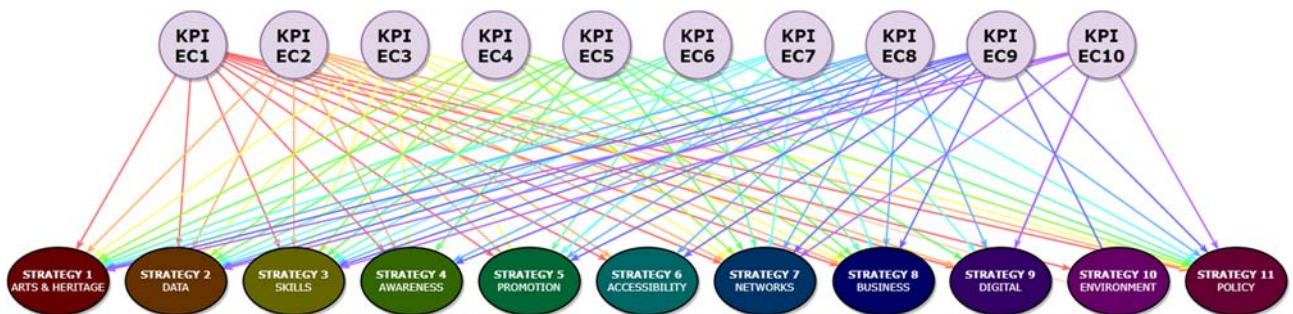


Figure 10 - Applicability of **EC** KPIs according to Strategy

### Assumption 3

According to the IMPACTOUR Methodology an Objective is linked to one or more Strategies. A Strategy acts as a group for Actions which are presented to the user though the IMPACTOUR Tool DDS Action screen. These relationships are shown in following Figure 11.

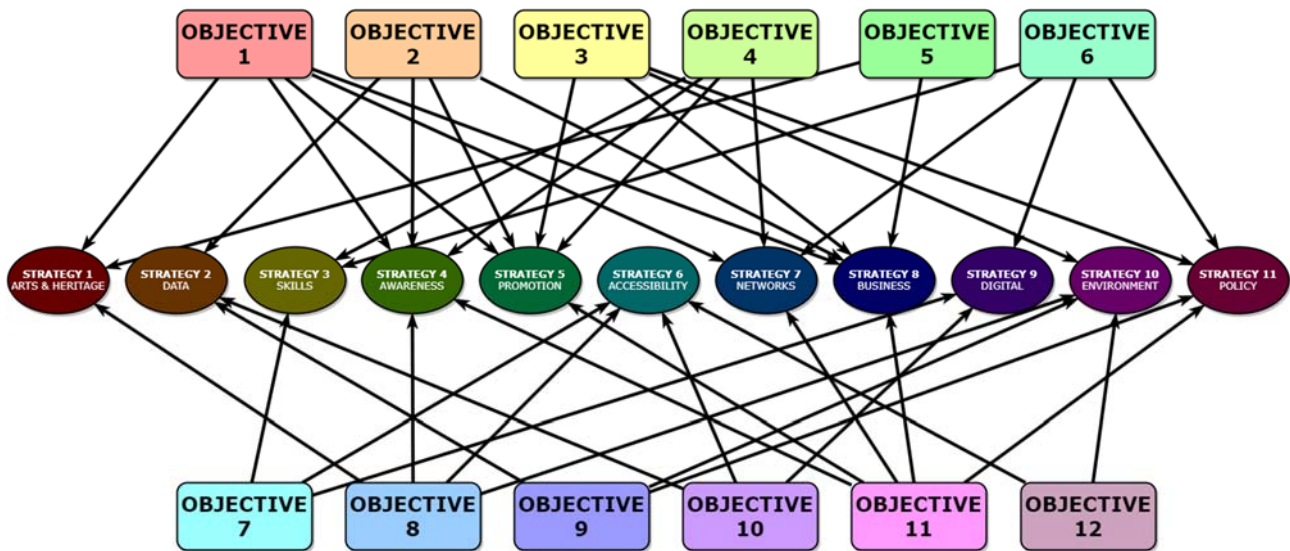


Figure 11 - High Level Strategy Objective Relationship

As a KPI is linked to an Action through the Strategy, and as each Strategy acts as a group for its Actions, KPIs can become linked by sharing Actions through mutual Objective/Strategy relationships. These relationships total 2806 possible links/relations between Actions and KPIs. This can be illustrated by using a simple example such as our test case KPI-CH10 which is linked to Strategy 1 by Actions 1.1, 1.2, 1.3, 1.4 and 1.6. Other KPI's in the same group (CH) share links with the same Actions as KPI-CH10 as shown in Table 5. Furthermore, it is visible by taking into account KPI-CH9 all the actions (1.1-1.6) are activated. On the other hand, KPI-CH1 and KPI-CH6 have no relevant actions and therefore no recommendations will be proposed to the user.

Table 5 - Strategy 1 Actions linked to CH KPIs

	KPI-CH1	KPI-CH2	KPI-CH3.1	KPI-CH3.2	KPI-CH4	KPI-CH5.1	KPI-CH5.2	KPI-CH6	KPI-CH7	KPI-CH8	KPI-CH9	KPI-CH10
Action 1.1		✓	✓	✓	✓	✓	✓			✓	✓	✓
Action 1.2		✓	✓	✓	✓						✓	✓
Action 1.3		✓	✓	✓		✓	✓			✓	✓	✓
Action 1.4		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Action 1.5		✓	✓	✓		✓	✓		✓	✓	✓	
Action 1.6						✓	✓			✓	✓	✓
Totals	0	5	5	5	3	5	5	0	2	5	6	5

Applied system wide in the IMPACTOUR Tool this is a complex network of relationships. As shown in tabular form in Table 6.

- Each Strategy on the coloured horizontal line shows the number of links in relation to all Objectives. The two right hand columns illustrate the total number of links for Actions and Objectives with the Strategy.
- Each Objective in the vertical columns shows the number of links with a Strategy. The total numbers of linked Actions and Strategies are shown at the bottom of the column.

Table 6 - Total Actions Linked by Objective/Strategy Connections

		OBJECTIVES												Links	
		OB 1	OB 2	OB 3	OB 4	OB 5	OB 6	OB 7	OB 8	OB 9	OB10	OB11	OB12	Actions	Objectives
STRATEGIES	ST 1	4	0	0	0	4	0	0	2	0	0	0	0	10	3
	ST 2	0	4	0	0	0	0	0	0	5	1	0	0	10	3
	ST 3	0	0	0	5	0	3	2	0	0	0	0	0	10	3
	ST 4	2	2	0	5	0	0	0	3	0	0	2	0	14	5
	ST 5	3	2	3	4	0	0	0	0	0	0	3	0	15	5
	ST 6	0	0	0	0	0	0	4	2	0	2	0	4	12	4
	ST 7	5	0	0	6	0	4	0	0	0	0	4	0	19	4
	ST 8	3	2	4	0	3	0	0	0	0	0	3	0	15	5
	ST 9	0	0	0	0	0	3	4	0	0	3	0	0	10	3
	ST 10	0	0	6	0	0	0	0	2	2	0	0	4	14	4
	ST 11	0	0	2	0	0	4	0	0	3	0	3	0	12	4
Links	Actions	17	10	15	20	7	14	10	9	10	6	15	8		
	Strategies	5	4	4	4	2	4	3	4	3	3	5	2		

**EXAMPLE:** Using KPI-CH10 we know that out of the 176 possibilities only 66 will pass the initial  $T_i \wedge CA_k$  test and of those only 36 will have valid Strategies to operate on. Those Strategies are 1, 4, 5, 8, 10 and 11. Therefore, out of those six strategies, only 5 are linked to objectives. It is obvious that Objective 7 is excluded (links shown in red on the table), and that Strategy 11 has mutual no connections to OB 1, OB 4, OB 5, OB 7 or OB 8.

As the Objectives are also connected to other KPIs by their mutual Actions in the Strategies it is possible to see what impact KPI-CH10 will have on other KPIs in the IMPACTOUR Tool. **This is clear in Figure 12 where the power of the system to predict and advice users on appropriate measures is illustrated.**

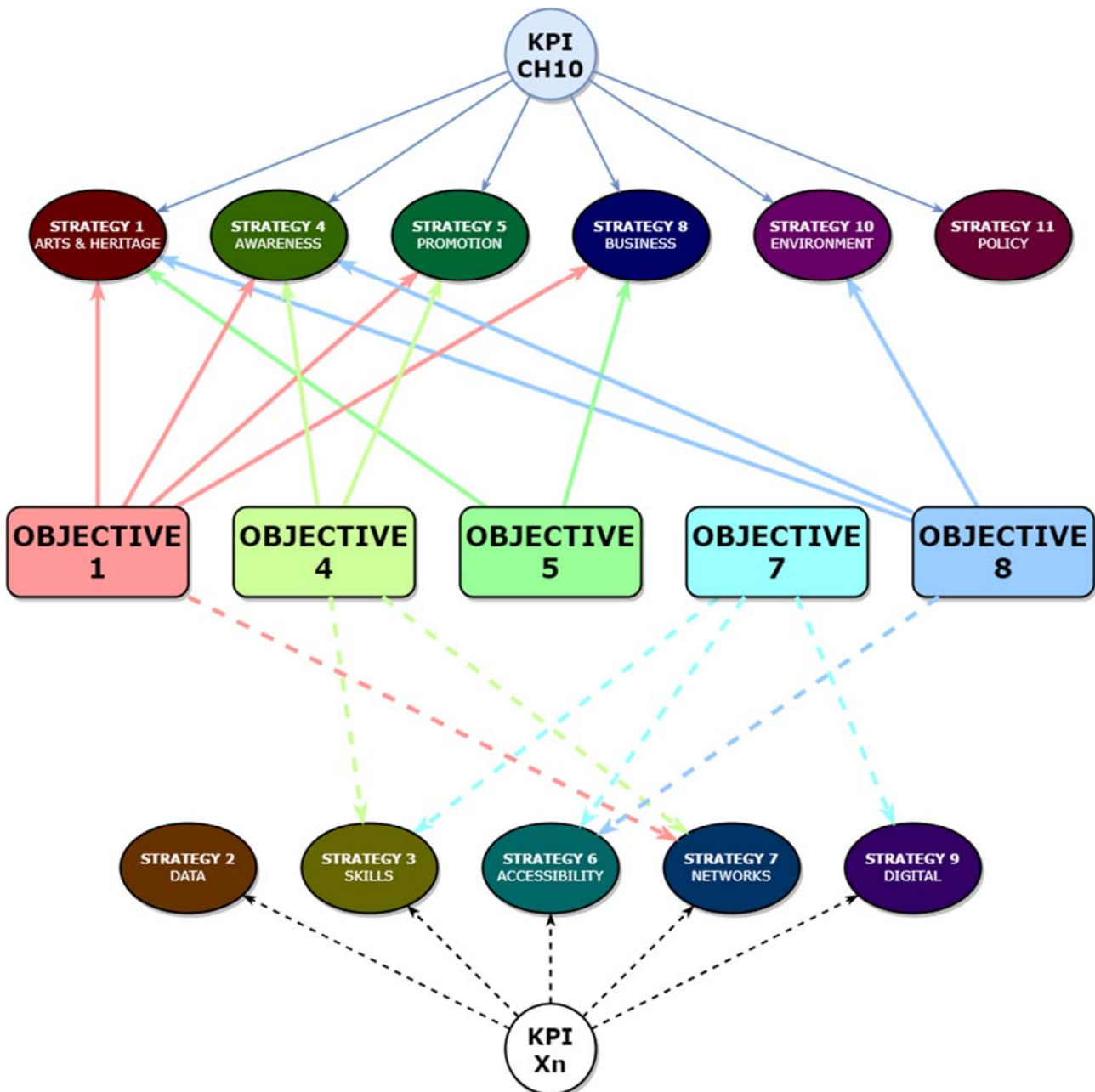


Figure 12 - KPI Connection to Objective Via Strategy (KPI CH10)

#### Assumption 4

Given that it has been shown that it is possible to track the validity of a KPI using the defined system parameters it should be possible to validate the IMPACTOUR Tool by regressively investigating the links for a KPI shown to the user in DSS Actions Screen.

**EXAMPLE:** Using the IMPACTOUR Tool we produced a list of KPI's, as shown in Figure 13. These steps are shown on the following screenshots in circled numbers.

1. KPI-CH10 "Availability of products with designation of origin or geographical indications (PDO, PGI), Traditional Specialities Guaranteed (TSG)" appears second on the list of the KPI recommendations (see Figure 13.)

2. The selected Action label is “Supporting vibrant cultural life, including diverse and inclusive cultural institutions, organizations, events, etc.” (i.e. Action 1.1) (Figure 13.)
3. In the preceding screen shown in Figure 14 the Strategy group for Action 1.1 is Strategy 1: Arts & Heritage, “Enhancing the protection and vitality of tangible and intangible cultural assets”
4. Objective 1: “Base on local skills to develop socioeconomic sustainable cultural tourism” is selected and is linked to Strategy 1 (See Figure 15)
5. In the Filtering Screen the selected Tourist Impact is selected as “No Cultural Tourism” (See Figure 15)
6. The Activity is set to “Agricultural Heritage” (See Figure 15)
7. The Type is set to “Rural” (See Figure 15)

As Rural and Agricultural is permissible ( $T_3 \wedge CA_3$ ) and compatible with Strategy 1 this combination is validated.

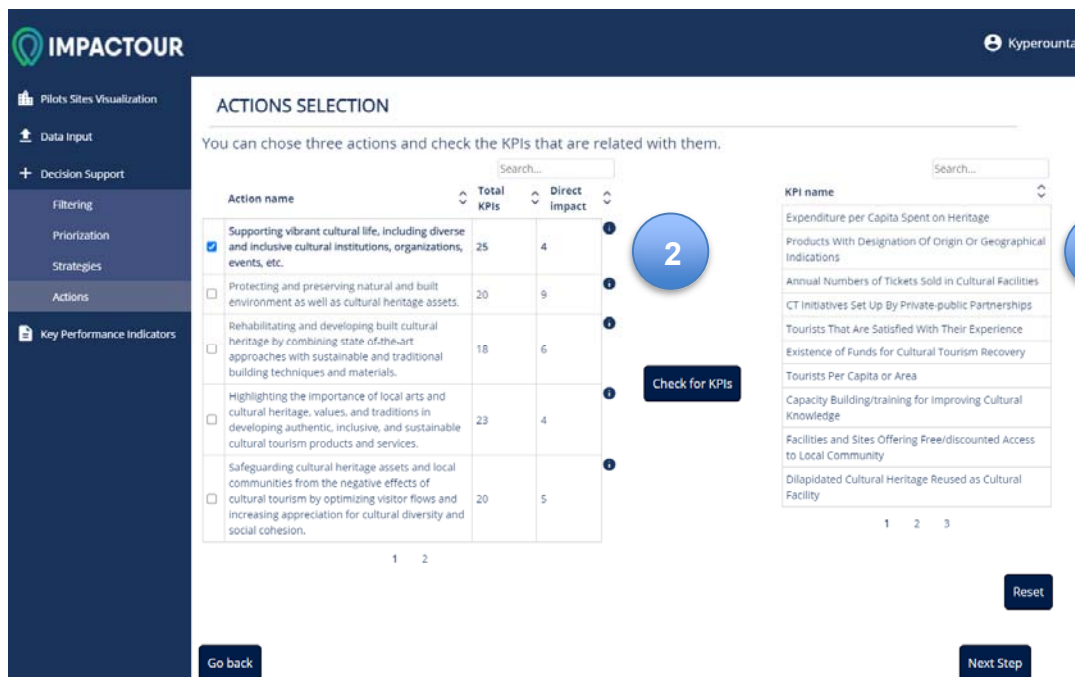


Figure 13 - IMPACTOUR Tool DDS Actions Screen Showing KPIs

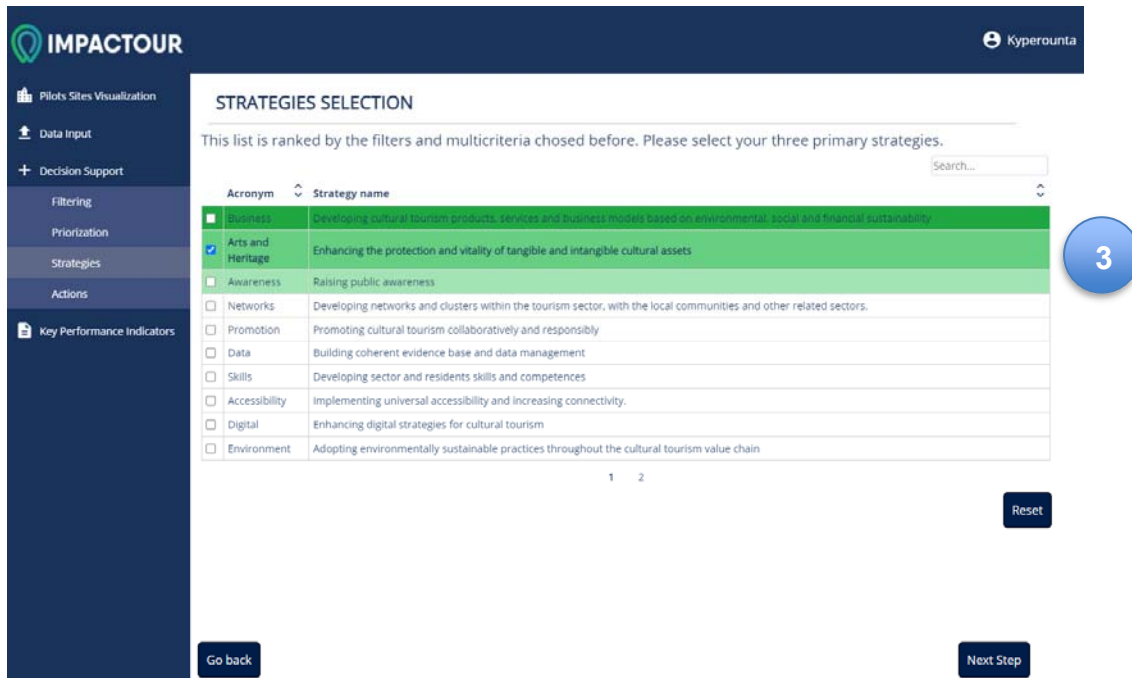


Figure 14 - IMPACTOUR Tool DDS Strategies Screen

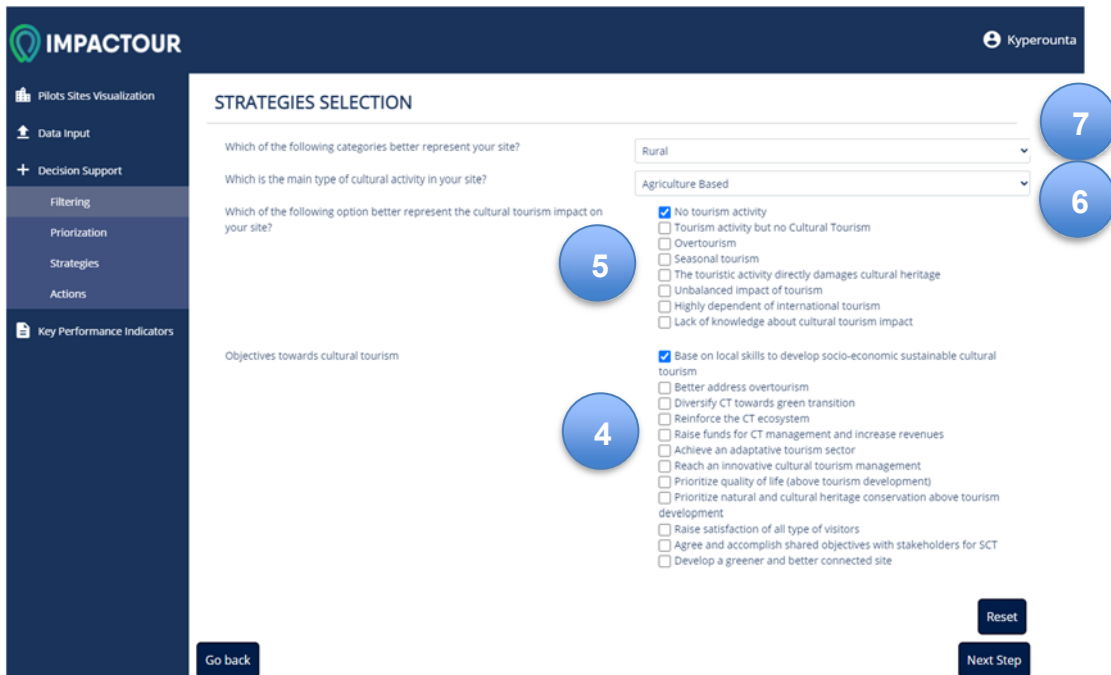


Figure 15 - IMPACTOUR Tool DDS Filtering Screen

## 3.3 Selecting a Team

### 3.3.1 Building a Community Tool

As the IMPACTOUR Tool has been envisioned to support sustainable Cultural Tourism destination Management (CTM) it is considered essential that the CTMs and other users from the community be involved throughout the process of the tool's development. The consortium partners, pilot managers, agents and stakeholders are best placed to provide insights, information and data requirements at the projects inception but also in validating and evaluating the tool.

#### Why Data Quality Is Important.

It is a measure of the condition of data based on factors such as accuracy, completeness, consistency, reliability and whether it is up to date. Measuring Data Quality (DQ) levels can help pilot owners and stakeholders identify data errors that need to be resolved and assess whether the data in the IMPACTOUR Toolkit tool is fit to serve its intended purpose. For example, if the information used in the metadata definition of a pilot is incorrect (such as inaccurate or colloquial name for a pilot site, wrong location details, incomplete descriptions in the Pilot Sites Visualization screen etc.)

The emphasis on DQ in the IMPACTOUR tool system will increase as data processing will become more intricately linked with local business investments, operations and authorities are increasingly using data analytics to help drive growth and local or regional decisions. Moreover, it is important to emphasise that the project's tool will be powered by machine learning algorithms module which will analyse the "Big Data" from all the pilots over time to detect trends, make predictions and provide more informed decisions for policymakers.

Therefore, Information and DQ management is a core component of the overall IMPACTOUR tool data management process, thus DQ improvement efforts are often closely tied to data governance programs that aim to ensure data is formatted and used consistently throughout their organisations.

#### Who Is the Community?

This deliverable will utilize the 30 sites registered as pilots within the IMPACTOUR Tool system at present, as described at the beginning of the report (0.2 Target Audience).

As the project is ongoing some of the participants (Listed in D3.2 Table 4.2 "Living Agents" p34/58) have yet to complete the task of adding or updating their site metadata and data and this provides an excellent opportunity to test and evaluate the tool from the ground up, both in terms of DQ and tool operation.

It is strongly recommended that each Pilot nominate or confirm one person as a Pilot Validation Representative (PVR) to act a single point of contact to ensure clear channels of communication, which have been already established within in the project under the communication tool named [IMPACTOUR Tool Testing Group](#) () during the validation exercise and avoid potential duplicates of the same issue arising for a Pilot.

### 3.3.2 Technical Support

It will be provided by the IMPACTOUR development team, which will include but not be limited to:

- Providing explanations of how processes work.
- Documentation where necessary and appropriate.
- Online manuals and workshops (How-to-use tool step by step guides)
- “Tricks & Tips” video shorts on the project’s social media channels.
- Responding to “bug fix” requests in a timely manner.

Wherever possible this will be done within an agreed time frame to ensure that any delay is kept to the minimum.

### 3.4 Developing Documents

It is acknowledged that the proposed validation method is efficient by considering the given challenges of the already collected multimodal big data of the first 30 pilots, which based on the novel ontology developed by the IMPACTOUR project, leads to a complex and heavily mathematical logic. Therefore, in order to ensure that Pilot Validation Representative (PVRs) can undertake the validation exercise in a timely and efficient manner the following steps will need to be undertaken.

**It is ESSENTIAL that the IMPACTOUR be able to show the ID number for Actions, Strategies, Objectives with the Tool (preferably as prefix to existing text) to enable PVRs to easily identify items and pathways.**

#### 3.4.1 Validation Process

These will be a series of documents detailing as far as possible in simple plain English how to track back a path from the results provided by the IMPACTOUR Tool. These will wherever possible use graphics and flow chart style illustrations to ensure communication of the validation process via the IMPACTOUR Tool Testing Group.

#### 3.4.2 Validation Exercise Report

Once a PVR has tested a path they will be required to complete a Validation Exercise Report (VER) this will either show the path to have been validated or identify an issue with the validation (i.e. unexpected results). Under the WP6 timeframe, the VER will be used to:

1. Confirm a path is valid (by consensus with multiple VER confirmations)
2. Provide baselines for confirmation (in the case of a single VER validation)
3. Identify anomalous validations (where there is a conflict in the VER validations)
4. Identify paths not validated by the validation exercise
5. Form the basis of issue reporting

#### 3.4.3 Issue Reporting

To ensure that PVRs provide as much information as possible to assist the technical support team in identifying and resolving potential issues with the IMPACTOUR Tool templated Issue Reports will be produced (see D6.2) and Change Requests Forms are produced (see Annex C). This will be finalised in consultation with the technical support team to ensure that the information contained within the form is as robust as possible and fit for purpose in regard to issue resolution.

### 3.5 Definition & Verification of Data

The importance of DQ has been discussed in 3.3 above this includes compliance with international standards as set out in the United Nations Group of Experts on Geographical Names (<https://unstats.un.org>).

This should be made clear on both the IMPACTOUR Tool when a new pilot site is registered (definition of pilot’s metadata) but also in the user documentation which will accompany the final release. Failure to do so will cause critical elements of the tool to fail-for instance the machine learning based components using similar site names in different languages and/or longitude and latitude to analyse transport links and tourist access will be severely impacted if the data is incorrect or inconstant with the expected standard.

Moreover, baseline characteristics must be discussed and verified in advance before entry into the tool via the Data Input session (Parameter Details screen see Figure 16)

Parameter	Value	Reference Date	Data Source	Remarks	Data Privacy
Total Population	1500	2011-00	Kyperounta's Council		Public
Total Area (km2)	8.7735	2011-00	Kyperounta's Council		Public
Number of cultural tourists	80000	2019-00	Kyperounta's Council		Public
Number of overall tourists	80000	2019-00	Kyperounta's Council		Public
Number of tangible cultural heritage sites (buildings, monuments, group of Heritage Departments National & buildings/complex, assets, route, etc.)	12	2021-00	Kyperounta's Council		Public
Number of intangible heritage	4	2021-00	Kyperounta's Council		Public
Number of museums and art galleries	3	2021-00	Kyperounta's Council		Public
Number of music venues (concert halls, clubs, etc.)		2021-00	Kyperounta's Council		Public
Number of theatres		2021-00	Kyperounta's Council		Public
Number of libraries or archives	2	2021-00	Kyperounta's Council		Public

Figure 16 - Example From the Kyperounta Pilot Set of Metadata

## 3.6 Issue Tracking and Performance Optimisation

Under the time frame of the project, the technical support provided by the IMPACTOUR development team will undertake the following

### 3.6.1 Issue Tracking

- Ensure all issues are properly logged and ticket number issued for follow up
- Ask PVRs targeted questions to quickly understand the root of the problem
- Diagnose and troubleshoot reported technical issues
- Research and identify solutions to software and hardware issues
- Prioritize and manage several open issues at one time
- Track issues through to resolution, within agreed time limits
- Talk PVRs through a series of actions, until they have solved a technical issue
- Properly escalate unresolved issues to appropriate team (e.g. software developers)
- Provide prompt and accurate feedback to PVRs and the IMPACTOUR Coordination Board
- Follow up with PVRs to ensure their Pilot is fully functional after troubleshooting
- Prepare accurate and timely reports
- Document technical knowledge in the form of notes and manuals

### 3.6.2 Change Requests

The technical support team will log any Change Request Submission (CRS) and ensure that these are passed to the appropriate team for consideration. A CRS does not guarantee that the change will be implemented. The CRS should only be implemented if there is a clear benefit to the either improvement to the system performance or enhancing the user experience/usability/understand of the system. This will reduce the potential for “feature creep” and ensure that deadlines and capacity are maintained. CRS will need to be approved, specified, and signed off by the appropriate team head and IMPACTOUR Coordination Board. A final meeting to close the updating process will be organized with the consortium Partners involved in WP5 and WP6, which will aim to address the changes to be considered, and define those to be implemented following the abovementioned.

## 4 Conclusions

This document has proposed and outlined a validation method for the Pilot metadata, data, and the general functionality of the IMPACTOUR Tool. This has a direct impact on the stakeholders and multidisciplinary user group that will ensure investment by the community to provide long term sustainability of the programme. The importance of ensuring that the **metadata and data used within the system are accurate, consistent, and updated cannot be overstated**. Without this base level of assurance the results offered to policymakers will be compromised – to use the popular phrase “*Garbage in – Garbage out*” applies here.

The report has set out ways in which the Pilot Validation Representative (PVR) can address and avoid this by using standardisation and workflows previously established within the project work packages (WP2-6) and by recognised external Cultural Heritage authorities, advisors and actors. Moreover, the validation process has built in to it methods by which errors can identified and reported through clear channels of communication to the appropriate group for resolution.

## Annex A: List of Acronyms/Abbreviations

Acronym/ Abbreviation	Description
<b>Λ</b>	Logical AND symbol
<b>AS-IS</b>	The baseline or current condition of the destination regarding its level of sustainable Cultural Tourism
<b>CRS</b>	Change Request Submission
<b>CT</b>	Cultural Tourism
<b>CTD</b>	Cultural Tourism Destination
<b>CTM</b>	Cultural Tourism Management
<b>DB</b>	Database
<b>DQ</b>	Data Quality
<b>DMO</b>	Destination Management Organization
<b>DSS</b>	Decision Support System
<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>GIS</b>	Geographic Information System
<b>HMI</b>	Human-machine Interface
<b>IMPACTOUR</b>	<b>IM</b> proving Sustainable Development Policies and <b>Pr</b> actices to assess, diversify and foster <b>C</b> ultural <b>TOUR</b> ism in European regions and areas
<b>KPIs</b>	Key Performance Indicators
<b>PDO</b>	Protected Designation of Origin
<b>ROI</b>	Return On Investment
<b>PVR</b>	Pilot Validation Representative
<b>SDLC</b>	Software Development Life Cycle
<b>SCT</b>	Sustainable Cultural Tourism
<b>UAT</b>	User Acceptance Testing
<b>UM</b>	User Management
<b>VER</b>	Validation Exercise Report
<b>VMP</b>	Visitor Management Plans
<b>WP</b>	Work Package

## Annex B: $(T_i \wedge CA_k) \wedge S$ Logic Tests

Table 7 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH1

KPI-CH1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	0	0	0	0	0	0	0	0	0	0	1
$T_1 \wedge CA_1$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_1 \wedge CA_2$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_1 \wedge CA_3$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_1 \wedge CA_4$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_2 \wedge CA_1$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_2 \wedge CA_2$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_2 \wedge CA_3$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_2 \wedge CA_4$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_3 \wedge CA_1$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_3 \wedge CA_2$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_3 \wedge CA_3$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_3 \wedge CA_4$	TRUE	0	0	0	0	0	0	0	0	0	0	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 12. Fail: 120. Rejected: 44.

Table 8 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH2

KPI-CH2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	0	1	1	1	1	1	0	0
$T_1 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_1 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_1 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_1 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_2 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_2 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_2 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_2 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_3 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_3 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_3 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_3 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_4 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_4 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_4 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	0	0
$T_4 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	0	0

Pass: 112. Fail: 64. Rejected: 0.

Table 9 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH3.1

KPI-CH3.1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	1	0	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 7. Fail: 4. Rejected: 165.

Table 10 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH3.2

KPI-CH3.2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	1	0	1	1	1	0	1
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	0	0	1	1	0	1	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	0	0	1	1	0	1	1	1	0	1

Pass: 63. Fail: 36. Rejected: 77.

Table 11 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH4

KPI-CH4		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	1	1	0	1	1	0	0	1
$T_1 \wedge CA_1$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_1 \wedge CA_2$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_1 \wedge CA_3$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_1 \wedge CA_4$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_2 \wedge CA_1$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_2 \wedge CA_2$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_2 \wedge CA_3$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_2 \wedge CA_4$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_3 \wedge CA_1$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_3 \wedge CA_2$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_3 \wedge CA_3$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_3 \wedge CA_4$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_4 \wedge CA_1$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_4 \wedge CA_2$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_4 \wedge CA_3$	TRUE	1	1	0	1	1	0	1	1	0	0	1
$T_4 \wedge CA_4$	TRUE	1	1	0	1	1	0	1	1	0	0	1

Pass: 112. Fail: 64. Rejected: 0.

Table 12 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH5.1

KPI-CH5.1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 10. Fail: 1. Rejected: 165.

Table 13 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH5.2

KPI-CH5.2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	0	1

Pass: 90. Fail: 9. Rejected: 77.

Table 14 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH6

KPI-CH6		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	0	0	0	0	0	0	1	0	0	0	1
$T_1 \wedge CA_1$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_1 \wedge CA_2$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_1 \wedge CA_3$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_1 \wedge CA_4$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_2 \wedge CA_1$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_2 \wedge CA_2$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_2 \wedge CA_3$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_2 \wedge CA_4$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_3 \wedge CA_1$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_3 \wedge CA_2$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_3 \wedge CA_3$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_3 \wedge CA_4$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_4 \wedge CA_1$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_4 \wedge CA_2$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_4 \wedge CA_3$	TRUE	0	0	0	0	0	0	1	0	0	0	1
$T_4 \wedge CA_4$	TRUE	0	0	0	0	0	0	1	0	0	0	1

Pass: 32. Fail: 144. Rejected: 0.

Table 15 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH7

KPI-CH7		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	0	1	1	1	1	1	1	1
$T_1 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_1 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_1 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_1 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_2 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_2 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_3 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_3 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	1	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 108. Fail: 24. Rejected: 44.

Table 16 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH8

KPI-CH8		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_2$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_3$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_4$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_1$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_2$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_1$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_2$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_1$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_2$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	0	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	0	1	1	1	1	1	1	1	0	1

Pass: 144. Fail: 32. Rejected: 0.

Table 17 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH9

KPI-CH9		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	1	0
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_1 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_1 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_1 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_4 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_4 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	0
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	0

Pass: 160. Fail: 16. Rejected: 0.

Table 18 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-CH10

KPI-CH10		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	1	0	0	1	0	1	1
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_2 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_3 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	0	1	1
$T_4 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	0	1	1

Pass: 36. Fail: 30. Rejected: 110.

Table 19 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-R1

KPI-R1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1

Pass: 176. Fail: 0. Rejected: 0.

Table 20 -  $T_i \wedge CA_k) \wedge S$  Logic Test for KPI-R2

KPI-R2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	0	0	1	1	1	1	1
$T_1 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_1 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_1 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_1 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_2 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_2 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_3 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_3 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_4 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_4 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_4 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	1	1	1
$T_4 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	1	1	1

Pass: 128. Fail: 48. Rejected: 0.

Table 21 -  $T_i \wedge CA_k$  Logic Test for KPI-R3

KPI-R3		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	0	1	1	1	1	1	1	0
$T_1 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_1 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_1 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_1 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_2 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_2 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_2 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_2 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_3 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_3 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_3 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_3 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_4 \wedge CA_1$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_4 \wedge CA_2$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_4 \wedge CA_3$	TRUE	1	1	0	0	1	1	1	1	1	1	0
$T_4 \wedge CA_4$	TRUE	1	1	0	0	1	1	1	1	1	1	0

Pass: 128. Fail: 48. Rejected: 0.

Table 22 -  $T_i \wedge CA_k$  Logic Test for KPI-R4

KPI-R4		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	1	1	1	1	1	1	0
$T_1 \wedge CA_1$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_1 \wedge CA_2$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_1 \wedge CA_3$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_1 \wedge CA_4$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_2 \wedge CA_1$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_2 \wedge CA_2$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_2 \wedge CA_3$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_2 \wedge CA_4$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_3 \wedge CA_1$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_3 \wedge CA_2$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_3 \wedge CA_3$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_3 \wedge CA_4$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_4 \wedge CA_1$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_4 \wedge CA_2$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_4 \wedge CA_3$	TRUE	1	1	1	0	1	1	1	1	1	1	0
$T_4 \wedge CA_4$	TRUE	1	1	1	0	1	1	1	1	1	1	0

Pass: 144. Fail: 32. Rejected: 0.

Table 23 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S1.1

KPI-S1.1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	1	1	1	1	1	1	1	1
$T_1 \wedge CA_1$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 10. Fail: 1. Rejected: 165.

Table 24 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S1.2

KPI-S1.2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	1	1	1	1	1	1	1	1
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_4 \wedge CA_3$	TRUE	1	1	0	1	1	1	1	1	1	1	1
$T_4 \wedge CA_4$	TRUE	1	1	0	1	1	1	1	1	1	1	1

Pass: 90. Fail: 9. Rejected: 77.

Table 25 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S2

KPI-S2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	0	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_1 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_1 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	1	0	1

Pass: 144. Fail: 32. Rejected: 0.

Table 26 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S3

KPI-S3		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1

Pass: 176. Fail: 0. Rejected: 0.

Table 27 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S4

KPI-S4		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	1	1	0	1	0	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	0	0	1
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	0	0	1

Pass: 84. Fail: 48. Rejected: 44.

Table 28 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S5

KPI-S5		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	1	1	0	1	1	1	0
$T_1 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_1 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_1 \wedge CA_3$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_1 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_2 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_2 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_2 \wedge CA_3$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_2 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_3 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_3 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_3 \wedge CA_3$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_3 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_4 \wedge CA_1$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_4 \wedge CA_2$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_4 \wedge CA_3$	TRUE	1	1	1	0	1	1	0	1	1	1	0
$T_4 \wedge CA_4$	TRUE	1	1	1	0	1	1	0	1	1	1	0

Pass: 128. Fail: 48. Rejected: 0.

Table 29 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S6

KPI-S6		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	0	1	1	0	1	1	0	1	1	0	1
$T_1 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_1 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_1 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_1 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_2 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_2 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_2 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_2 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_3 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_3 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_3 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_3 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_4 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_4 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_4 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	1
$T_4 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	1

Pass: 112. Fail: 64. Rejected: 0.

Table 30 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-S7

KPI-S7		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	0	1	1	0	1	1	0	1	1	0	0
$T_1 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_1 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_1 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_1 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_2 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_2 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_2 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_2 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_3 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_3 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_3 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_3 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_4 \wedge CA_1$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_4 \wedge CA_2$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_4 \wedge CA_3$	TRUE	0	1	1	0	1	1	0	1	1	0	0
$T_4 \wedge CA_4$	TRUE	0	1	1	0	1	1	0	1	1	0	0

Pass: 96. Fail: 80. Rejected: 0.

Table 31 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-C1

KPI-C1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1

Pass: 112. Fail: 64. Rejected: 0.

Table 32 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-C2

KPI-C2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	0	0	0	1	0	1	1
$T_1 \wedge CA_1$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_1 \wedge CA_2$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_1 \wedge CA_3$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_2 \wedge CA_2$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_2 \wedge CA_3$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_1$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_4 \wedge CA_2$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_4 \wedge CA_3$	TRUE	1	0	0	1	0	0	0	1	0	1	1
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 45. Fail: 54. Rejected: 77.

Table 33 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-C3

KPI-C3		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	1	1	0	1	0	1	1
$T_1 \wedge CA_1$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_1 \wedge CA_2$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_3 \wedge CA_2$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_4 \wedge CA_1$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_4 \wedge CA_2$	TRUE	1	0	0	1	1	1	0	1	0	1	1
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	TRUE	1	0	0	1	1	1	0	1	0	1	1

Pass: 63. Fail: 36. Rejected: 77.

Table 34 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-C4

KPI-C4		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	1	0	0	1	1	1	1
$T_1 \wedge CA_1$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_1 \wedge CA_2$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_1 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_1 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_2 \wedge CA_1$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_2 \wedge CA_2$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_3 \wedge CA_1$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_3 \wedge CA_2$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_4 \wedge CA_1$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_4 \wedge CA_2$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_4 \wedge CA_3$	TRUE	1	0	0	1	1	0	0	1	1	1	1
$T_4 \wedge CA_4$	TRUE	1	0	0	1	1	0	0	1	1	1	1

Pass: 112. Fail: 64. Rejected: 0.

Table 35 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-C5

KPI-C5		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	1	1	1	1	1	0	0
$T_1 \wedge CA_1$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_1 \wedge CA_2$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_2 \wedge CA_1$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_2 \wedge CA_2$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_3 \wedge CA_1$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_3 \wedge CA_2$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_4 \wedge CA_1$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_4 \wedge CA_2$	TRUE	1	0	0	1	1	1	1	1	1	0	0
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	TRUE	1	0	0	1	1	1	1	1	1	0	0

Pass: 84. Fail: 48. Rejected: 44.

Table 36 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-C6

KPI-C6		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	1	0	0	0	0	1	1
$T_1 \wedge CA_1$	TRUE	1	0	0	1	1	0	0	0	0	1	1
$T_1 \wedge CA_2$	TRUE	1	0	0	1	1	0	0	0	0	1	1
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	TRUE	1	0	0	1	1	0	0	0	0	1	1
$T_2 \wedge CA_2$	TRUE	1	0	0	1	1	0	0	0	0	1	1
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_1$	TRUE	1	0	0	1	1	0	0	0	0	1	1
$T_4 \wedge CA_2$	TRUE	1	0	0	1	1	0	0	0	0	1	1
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 30. Fail: 36. Rejected: 110.

Table 37 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-C7

KPI-C7		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	0	0	1	1	0	1	1
$T_1 \wedge CA_1$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_1 \wedge CA_2$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_2 \wedge CA_1$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_2 \wedge CA_2$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_3 \wedge CA_1$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_3 \wedge CA_2$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_4 \wedge CA_1$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_4 \wedge CA_2$	TRUE	1	0	0	1	0	0	1	1	0	1	1
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	TRUE	1	0	0	1	0	0	1	1	0	1	1

Pass: 72. Fail: 60. Rejected: 44.

Table 38 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-ENV1

KPI-ENV1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	1	1	0	0	1	1	0	1	1
$T_1 \wedge CA_1$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_1 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_1 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_1 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_2 \wedge CA_1$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_2 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_2 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_2 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_3 \wedge CA_1$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_3 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_3 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_3 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_4 \wedge CA_1$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_4 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_4 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_4 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1

Pass: 112. Fail: 64. Rejected: 0.

Table 39 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-ENV2

KPI-ENV2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	1	1	0	0	1	1	0	1	1
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_1 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_1 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_2 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_2 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_3 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_3 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_4 \wedge CA_3$	TRUE	1	0	1	1	0	0	1	1	0	1	1
$T_4 \wedge CA_4$	TRUE	1	0	1	1	0	0	1	1	0	1	1

Pass: 84. Fail: 48. Rejected: 44.

Table 40 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-ENV3

KPI-ENV3		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	0	0	0	1	1	1	1	1	0	1	1
$T_1 \wedge CA_1$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_1 \wedge CA_2$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_1 \wedge CA_3$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_1 \wedge CA_4$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_2 \wedge CA_1$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_2 \wedge CA_2$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_2 \wedge CA_3$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_2 \wedge CA_4$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_3 \wedge CA_1$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_3 \wedge CA_2$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_3 \wedge CA_3$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_3 \wedge CA_4$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_4 \wedge CA_1$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_4 \wedge CA_2$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_4 \wedge CA_3$	TRUE	0	0	0	1	1	1	1	1	0	1	1
$T_4 \wedge CA_4$	TRUE	0	0	0	1	1	1	1	1	0	1	1

Pass: 112. Fail: 64. Rejected: 0.

Table 41 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-ENV4

KPI-ENV4		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_1 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_1$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_2$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	1	0	1	1	0	0	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	1	0	1	1	0	0	1	1	0	1

Pass: 112. Fail: 64. Rejected: 0.

Table 42 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-ENV5

KPI-ENV5		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	0	0	1	0	0	0	0	0	1	0
$T_1 \wedge CA_1$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_1 \wedge CA_2$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_2 \wedge CA_2$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_3 \wedge CA_2$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_1$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_4 \wedge CA_2$	TRUE	1	0	0	1	0	0	0	0	0	1	0
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 24. Fail: 64. Rejected: 88.

Table 43 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC1

KPI-EC1		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1

Pass: 176. Fail: 0. Rejected: 0.

Table 44 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC2

KPI-EC2		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	1	1
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	1	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 88. Fail: 0. Rejected: 88.

Table 45 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC3

KPI-EC3		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	0	1	1	0	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_1 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_1 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_2 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_3 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_4 \wedge CA_3$	TRUE	1	1	1	1	1	0	1	1	0	0	1
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	0	1	1	0	0	1

Pass: 128. Fail: 48. Rejected: 0.

Table 46 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC4

KPI-EC4		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	0	0	1	1	0	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_1 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_1 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_2 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_3 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_4 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	0	0	1
$T_4 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	0	0	1

Pass: 96. Fail: 80. Rejected: 0.

Table 47 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC5

KPI-EC5		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1

Pass: 128. Fail: 48. Rejected: 0.

Table 48 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC6

KPI-EC6		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	1	0	1	1	0	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_1 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_1 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_2 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_3 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_4 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	0	0	1
$T_4 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	0	0	1

Pass: 112. Fail: 64. Rejected: 0.

Table 49 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC7

KPI-EC7		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_1 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_3$	TRUE	1	1	1	0	1	0	1	1	1	0	1
$T_4 \wedge CA_4$	TRUE	1	1	1	0	1	0	1	1	1	0	1

Pass: 128. Fail: 48. Rejected: 0.

Table 50 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC8

KPI-EC8		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 10. Fail: 1. Rejected: 165.

Table 51 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC9

KPI-EC9		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_1 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_2 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_3 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_1$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_2$	TRUE	1	1	1	1	1	1	1	1	1	0	1
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	TRUE	1	1	1	1	1	1	1	1	1	0	1

Pass: 120. Fail: 12. Rejected: 44.

Table 52 -  $(T_i \wedge CA_k) \wedge S$  Logic Test for KPI-EC10

KPI-EC10		ST 1	ST 2	ST 3	ST 4	ST 5	ST 6	ST 7	ST 8	ST 9	ST 10	ST 11
$T_i \wedge CA_k$ Test	KPI Mask	1	1	1	0	0	0	1	1	1	0	1
$T_1 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_1 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	1	0	1
$T_1 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	1	0	1
$T_2 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_2 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	1	0	1
$T_2 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	1	0	1
$T_3 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_3 \wedge CA_3$	TRUE	1	1	1	0	0	0	1	1	1	0	1
$T_3 \wedge CA_4$	TRUE	1	1	1	0	0	0	1	1	1	0	1
$T_4 \wedge CA_1$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_2$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_3$	FALSE	X	X	X	X	X	X	X	X	X	X	X
$T_4 \wedge CA_4$	FALSE	X	X	X	X	X	X	X	X	X	X	X

Pass: 42. Fail: 24. Rejected: 110.

## Annex C: Change Request Form

# IMPACTOUR TOOL VAR

**NOTE: This file to be saved as the Internal Reference Number**

Registration	Details (to be filled in)
Date Raised	2023-03-19
Name	Marinos IOANNIDES
Organization	CUT
Contact	Marinos.ioannides@cut.ac.cy
Pilot*	CUT
Internal Reference	CUT-20230319-003

\*if part of general testing use partner Organization ID

Issue Concerns	Details (to be filled in)
Area (Screen)	Decision Support System, Actions
Action (Activity)	Identification of Actions
Priority (Urgency)	High

### Issue Details

**Please include as much detail as possible about the issue you are.**

**Please restrict the report to one (1) issue if possible.**

**If necessary raise a separate VAR citing this document Reference.**

The recent addition of the ID field to identify the action is essential to the validation exercise(s) of the project and for user information. However the ID is presented as an integer number and not in the decimal notation 1.1, 1.2 etc. as defined in D4.4 Annex I p50/58 (where the whole number refers to the Strategy 1-11 and the fractional to the action)

### Replication

**If it is possible please describe how to replicate the issue.**

**Please use easy steps to describe the actions.**

N/a

### Possible Solution

**If you have a solution or suggestion to remedy the issue you can note it here.**

**NOTE This form is NOT a Change Request Form.**

If it is not possible to represent the Action ID as the decimal please can a list of integer number IDs and their associated textual component be produced for reference and entered into the project documentation. This will be needed for validation and as a record to allow readers of previous deliverables that cite the decimal notation to understand the presented ID.

## Screen Shots

If appropriate please include screenshots to help understand the issue.  
If multiple screenshots are required please include them in order and with a number identifier.

**IMPACTOUR** Kyperounta

Press **F11** to exit full screen

### ACTIONS SELECTION

You can choose **three** actions and check the KPIs that are related with them.

id	Action name	Total KPIs	Direct impact
<input checked="" type="checkbox"/> 39	Practising sustainable cultural tourism management and business models by implementing management systems for long-term balanced tourism activity and integrating digital and green transition principles into cultural tourism business model development to better address overtourism.	23	2
<input type="checkbox"/> 40	Encouraging contribution and retention of tourism spending in the local economy through supporting local enterprises, supply chains and clusters, and sustainable investment.	20	10
<input type="checkbox"/> 41	Increasing visitors' expenditure by extending the visitors' stay and creating high-value and diversified cultural tourism offers.	26	13
<input type="checkbox"/> 42	Diversifying cultural tourism offer, reducing the seasonality of cultural tourism, and extending the stay of visitors to balance negative impact of overtourism.	27	16
<input type="checkbox"/> 43	Applying design thinking methodology to develop user-friendly and accessible cultural tourism products and services.	25	15

**Check for KPIs**

KPI name
Management Plans Addressing Seasonality and Carrying Capacity
Existence Of Tools To Manage Carrying Capacity
Cultural Facilities And Sites Offering Digital Tourism Offer
Tourists Per Capita or Area
Residents Employed in Cultural Tourism
Capacity Building/training for Improving Cultural Knowledge
Website Accessibility for All
Exports Of PDO Or PGI as a Percentage of all Regional Sale
Income Related to the Access and Use of Cultural Facilities and Sites
Existence of Funds for Cultural Tourism Recovery

1 2 3

**Go back** **Reset**  
**Next Step**

### FOR TECHNICAL SUPPORT TEAM USE ONLY

<b>Date</b>	YYYY-MM-DD	<b>Status</b>	Open/Closed
<b>Action Taken</b>	Details of actions taken to resolve the issue		
<b>Date</b>	YYYY-MM-DD	<b>Status</b>	Open/Closed
<b>Action Taken</b>	Add extra lines if needed		