**Strategies and approaches for managing risks in the official statistics production: ISTAT experience in the modernisation programme**

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**Abstract**

*Today institutional organizations are facing pressing and emerging challenges going to meet the speed of technology, the demands for change, necessary to ensure efficiency and competitiveness. Change processes are carriers of risks and opportunities because they are able to create value. Processes must be on time and flexible but it is necessary increase attention to the risk analysis, both at strategic and operational level, to assure the achievement of the goals. Italian national Institute of Statistics (ISTAT), with the modernisation program (2016), has adopted a complete program of change with the aim of evolving the statistical production system from traditional survey models based on the direct acquisition of data from citizens and companies towards a model that uses statistical registers. It is an ambitious program that aims to overcome the "silos" vertical processes of traditional statistical production with a high level of risk. The model provides the creation of an integrated system of registers, of a single logical infrastructure of data deriving from administrative sources, from new innovative sources (Big Data) and powered by continuous data flows. The paper describes the framework adopted by ISTAT to organize the activities of the program, focusing on strategies developed for risk management. According to Business Architecture model (BA), at enterprise level risk management is implemented through an organization of the activities in thematic portfolio connected to statistical registers and to service for statistical production. At corporate level one of the actions implemented to minimize the risks of statistical activities is the identification of seven strategic innovation programs and the adoption of a Portfolio and Project Management (PPM) approach. At operational level, the statistical activities organization following a management by project approach that select initiatives and organize the work in phases, with a specific control of risks associated to the single phase.*

**Keywords:** Risk management, portfolio and project management, modernisation, business architecture, strategic and operational risk.

**1. Introduction**

Today we are assisting to a process of change and innovation of the institutional organizations and, more generally, of the whole society, necessary to guarantee efficiency and competitiveness. This dynamism has led institutional organizations to design efficient strategies that take full advantage of the available resources with an orientation to innovation. New technologies offer challenging development scenarios with an impact on production processes. Change processes are carries of risks and opportunities because they able to create value and improve the quality. Official statistical production are facing pressing and emerging challenges, too. Processes must be on time and flexible but it is necessary increase attention to the risk analysis, both at strategic and operational level, to assure the achievement of the statistical goals.

In the literature the concept of risk is typically related to economic impacts generated by a conditioning event. These events can be quantified through appropriate analysis. Risks are events or uncertain conditions that, if they happen, can have a negative or positive effect on the objectives of the organization.

The same concept is taken up in the methodologies of Portfolio and Project Management where risk is closely related to the project management. Risks and uncertainties affect the scope, cost-time, results and quality of the project. The uncertainty should not be confused with the risk, however it can be understood as a risk difficult to measure. In the production of official statistics the risk management is often neglected. However, risk analysis is an essential component of the planning phase of the activities. Innovation-oriented organizations have the needs to analyze the risks at the planning stage and the organization of the activities can be influenced by the increased attention to risks.

**2. Influence of risk management on ISTAT organizational activities model**

Italian National Institute of Statistics (Istat), with the modernisation program (2016), has adopted a complete program of change with the aim of evolving the statistical production system from traditional survey models, based on the direct acquisition of data from citizens and companies, towards a model that uses statistical registers. In 2016 a new organizational structure has been defined. It is based on Business Architecture model that identifies four main functional areas: production, support, capacity, strategy. According to this organizational model, statistical production overcomes vertical process (silos) to perform activities moving towards a matrix model. As part of the modernisation programme, Istat has identified Portfolio and Project Management (PPM) framework as a priority to organize activities at strategic and operative level.

At Istat, PPM assumed a crucial role not only to plan activities but also to organize and manage activities improving risks control and performance monitoring. All Istat activities, named initiatives, are organized “like a project”, with a focus on resources, deliverables, timing, performance and risks. PPM is the integrated model of organization and representation of Istat activities, which also constitutes a common framework, necessary to undertake coherent and shared paths of innovation at different level.

Istat planning process adopts a top-down approach based on well-defined, communicated and measurable strategies and a bottom-up process to define operatives actions, initiatives, according to the strategy. The adoption of PPM model allows:

* to increase the alignment of all activities with the Istat strategy of modernisation;
* to ensure full governance of the initiatives, controlling the use of resources and results;
* to implement a strong orientation to output;
* to achieve flexibility in managing critical issues;
* to analyse and to manage risks at strategic and operational level.

 Istat project approach has been adopted independently of type, size, complexity or relevance of activities: it includes statistical initiatives and innovative research initiatives. It is a general framework that helps to organize all activities with a focus on outputs. It is also a cultural approach that increases the focus on risk management at different level, with a growing attention for the events that can influence the modernisation program and his implementation.

**3. Managing complexity with a focus on risks**

Istat project-based organization helps to manage complexity under different points of view. Strengthening Istat ability to monitor the achievement of results, the use of resources, time to delivery, checking the coherence of output with the modernisation program are certainly the strengths of the PPM model adopted. Under another point of view, managers and statistical researchers put in action a specific attention to minimizing risks, creating new opportunities and achieving the objectives that have been set in the planning phase. From a logical point of view, Istat risk scenarios are derived in two different way according to the planning process:

* a top-down approach, in which the analysis starts from the overall statistical objectives and performs an identification of the most relevant and probable risk factors that can impact statistical objectives;
* a bottom-up approach, in which a list of generic scenarios is used to define a set of more concrete an customized risks associated to the initiatives.

Istat risk approach can be hierarchically represented through a Risk Breakdown Structure (RBS) considering, in this way, the entire range of sources from which the risks may originate. Risks identification starts from the detection, definition and listing of potential sources of risk. RBS is helpful in order to understand which areas might require special attention, and whether there are any recurring risk themes, or concentrations of risk. In this way it is possible to identify and describe risks exposure at different levels. For each potential source of defined risk, it is necessary to identify elements that could cause an adverse effect. Table 1 shows Istat Risk Breakdown Structure (RBS). The categories of risk represented group the individual risks.

**Table 1. Istat Risk Breakdown Structure (RBS) – Risk categories**

|  |  |  |
| --- | --- | --- |
| **RBS Level 0** | **RBS Level 1** | **RBS Level 2** |
| Sources of Risk | 1. Enterprise Risk
 | * 1. Legislation / Regulatory
	2. Competition
	3. Context
	4. Strategy
	5. Corruption
	6. Portfolio Management
 |
| 1. Corporate Risk

(innovation and modernisation) | * 1. Program / Project Management
	2. Scope definition
	3. Requirements definition
	4. Organization
	5. Resources Assignment
	6. Communication
 |
| 1. Operational Risk
 | * 1. Operations management
	2. Environmental
	3. Economic and financial
	4. Contractual term and conditions
 |

Istat planning stage includes risk management as a systematic and continuous process that leads to the identification, assessment and management of risks in line with accepted risk levels. Risk exists at every level, but this coordinated approach to risk management, from the enterprise level to the operational level, ensures alignment and consistency. In the projects, a careful risk analysis, in each level, allows the assessment and consolidation of the risk areas of the Table 1. Each project contains individual risks, that can affect the achievement of project goals, and overall risks, which derives from the combination of single project risks and from other sources of uncertainty. When unmanaged, these risks have potentially to cause the project deviate from the plan and the project fails to achieve the defined goals. Consequently, the effectiveness of risk management is directly related to project success. The coordinated approach increases the efficiency of risks analysis in the programs and portfolio structure, providing the maximum overall value for a given level of risk exposure.

**4. Risks at enterprise level**

At enterprise level, risk management is implemented through a risk scenario analysis at portfolio level. Istat portfolio is a set of initiatives that are independent of each other, related to the achievement of enterprise goals connected with institutional and statistical mission. The portfolio is on charge with an organization structure (Directorate) that is responsible for achieving specific goals with given resources. All the Institute activity is organized into ten portfolio divided into four main categories.

In the first category there are four portfolios that group initiatives to produce statistical output. It includes:

* Individual and households;
* Business statistics;
* National accounts;
* Geographical and territorial units;

In the second category there are four portfolios that group initiatives to delivery technical services to support statistical production. It includes:

* Statistical methodologies;
* Data collection;
* Information technology;
* Communication and dissemination.

The third category contains a portfolio that group initiatives to support governance respectively, concerning strategic planning and coordination of the National Statistical System, harmonizing Institute’s actions in terms of institutional relations and international affairs. The fourth category includes all administrative initiatives concerning legal-administrative activities, economic-financial management, logistics, procurement, personnel management, training. Table 2 shows the four main categories and thematic portfolios associated. For each portfolio the table shows the number of initiatives planned for the year 2018, human resources dedicated expressed in term of full time equivalent (FTE) and the number of Istat project manager. FTE is the metric used to indicate a resource allocated on the initiatives. FTE is equal one for a total of 260 work days in a year.

**Table 2. Projects, Human Resources (FTE) and Project Managers in Portfolio – Year 2018**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Main Categories*** | *Production* | Portfolio | **Initiatives Number** | **Human****Resources (FTE)** | **Project Manager****Number** |
| [CE] National accounts | **60** | **154.5** | **49** |
| [IF] Individual and households | **113** | **293.7** | **97** |
| [UE] Business Statistics | **61** | **223.0** | **45** |
| [UG] Geographical and territorial units | **46** | **127.3** | **39** |
| *Technical Services* | [CD] Communication and dissemination | **40** | **152.3** | **37** |
| [IT] Information technology | **49** | **225.6** | **41** |
| [ME] Methodologies | **32** | **109.1** | **29** |
| [RD] Data collection | **53** | **348.9** | **50** |
|  | [CS] Governance  | **41** | **120.8** | **35** |
|  | [SG] Administrative Services | **70** | **357.3** | **58** |
|  |  | **Total** | **565** | **2112.5** | **480** |

Source: ISTAT - https://[ppmo.istat.it](http://www.ppmo.istat.it)

At enterprise level, risk analysis is based on the identification of risk factors that influence each portfolio. They can be of different nature and they can be classified in environmental factors and capabilities. The environmental factors include internal and external factors that influence the portfolio. The difference is the degree of Istat control has over the factors and in particular the internal factors. They are under the control of the enterprise, instead the external factors are outside the control of the enterprise. Capabilities is connected to enterprise initiatives and resources in terms of number and type.

**5. Risks at corporate level**

Managing risks at corporate level is connected to innovation and modernisation. PPM approach helps Istat to define and clearly identify projects with a high level of innovation, closely related to the modernisation program. They represent the highest risk assets. Istat modernisation program identifies seven strategic programs of actions (PG). A strategic program represents clusters of relevant innovative projects defined to achieve specific goals of modernisation. The relevance is measured in terms of impact of the project at corporate level and transversally of the innovation introduced according to modernisation. Istat strategic programs are shown in Table 3. The table shows also the associated projects and human resources effort allocated (FTE) for the next three years.

**Table 3. Strategic programs, number of projects and dedicated human resources – Years 2018**

|  |  |  |
| --- | --- | --- |
| **(PG) Strategic Programs** | **Projects** (number) | **Human Resources** (FTE) |
| PG01. Development of integrated System of Registers | **19** | **133.8** |
| PG2. Significant knowledge broadening | **28** | **63.9** |
| PG3. Development of methodological and thematic research  | **4** | **22.8** |
| PG4. Higher strength and security | **8** | **32.6** |
| PG5. Better information and communication | **5** | **23.2** |
| PG6. Complete data and processes digitization | **3** | **22.7** |
| PG7. Development of skills and responsibilities | **3** | **13.2** |
| **Total** | **70** | **312.2** |

Source: ISTAT - https://[ppmo.istat.it](http://www.ppmo.istat.it)

As a result, we focus in the strategic programs the innovative drive as subject with an high risk. Specific documents, PG folders, examine and describe risks analysis and actions that will be implemented to minimize risks and issues identified.

**6. Risks at operational level**

At operational level, the project-based organization of the activities helps to organize the work in phases, and to implement a specific control of the operative risks associated with the single phase. In the planning phase, initiatives are proposed and defined in each portfolio. In this phase a risk analysis is conducted with the identification of the actions that can mitigate the risks. Initially, the risk analysis is included in the Business Case, then the risk responses are considered in a specific project risk form. Finally it is defined and planned the set of actions necessary to manage the risk.

**7. The schema adopted to collect data on risks**

The schema adopted to collect data on risks is implemented by specific sections in a Portfolio and Project Management Information System (https://[ppmo.istat.it](http://www.ppmo.istat.it)), used to organize and plan all Istat activities. The collection takes place directly on the project. The Project Manager, after having carried out an accurate risk analysis, inserts each project risk with the characterizing information in a specific form. The information on the risk concerns:

* the type of risk (corruption, organizational, strategic, programmatic, planning and operational);
* the specific risk categories associated (economic, environmental, legal/regulatory, organizational and resources management, technical, reputation).

All risks are qualified by assigning a priority and a severity level and defining the probability and impact thresholds most suitable to the project analyzed. Finally, the Project Manager is invited to analyze and to insert the response associated with the risk. The possible response actions are listed below:

* actions to avoid the risk by eliminating the cause or bringing the project within agreed risk thresholds;
* actions to transfer / share the risk through the adoption of policies involving third parties, outsourcing;
* actions to mitigate risk with the adoption of less complex processes, trying to act, starting from the initial phases, on the factors that determine its severity;
* actions to accept that allow to manage the risk with low priority in the individual activities at the operational level.

**8. Final considerations and next steps**

Istat approach for managing risk allows to have a coordinate vision of risks at the strategic and operational level with a specific focus on monitoring innovation and modernisation. The approach helps also to identify and actions that ensure the continuous improvement of activities under a risk control. As an improvement of the approach, Istat is considering the possibility to introduce a quantitative analysis associated to the actual risk analysis. The challenge is to evaluate every risk that could impact in the project activities refining the actual evaluation and classification techniques. All risks are connected to activities: they could be defined in a risk map. For each probability and impact threshold of each project can be defined the resulting associated risk matrix. Table 4 shows an example of the definition of the impact for three different project objectives (time, cost, and quality). The definitions would be adopted on the basis of the individual project and the risk thresholds accepted by the organization. The created thresholds would be based on the experience of the Project Manager.

**Table 4. Example of Definition for Probability and Impacts referred to three different project objectives (Time, Cost, Quality).**

|  |  |  |
| --- | --- | --- |
| **Scale** | **Probability** | **Impacts on project major objectives**  |
| **Time** | **Cost** | **Quality** |
| Very High | >70% | Increase in time < 40% | Increase in cost < 60% | Very significant impact on overall functionality |
| High | 51-70% | Increase in time between 20 – 40%  | Increase in cost between 40 – 60% | Significant impact on overall functionality |
| Medium | 31-50% | Increase in time between 10 – 20% | Increase in cost between 20 – 40% | Impact of some kind on key functional areas |
| Low | 11-30% | Increase in time between 5 – 10% | Increase in cost between 10 – 20% | Light impact on overall functionality |
| Very Low | 1-10% | Increase in time < 5% | Increase in cost < 10% | Light impact on secondary functionalities |
| Null | <1% | Insignificant Increase in time | Insignificant Increase in cost | No change in functionality |

The project manager would place the project in a specific position of the risk matrix considering probability and impact on the basis of a personal logical evaluation (based only on its own experience / professional competence). Table 5 shows an example of probability and impact matrix with a scoring scheme that Istat is planning to adopt for project at operational level. However, it is necessary to strengthen the use of PPM techniques and tools with more detail on risk management to conduct innovative initiatives. The key is to make the project manager aware of the importance of the continuous risk analysis connected with the activities management in order to direct the projects towards the achievement of the objectives.

**Table 5. Example of probability and impact matrix with a scoring scheme.**

|  |  |  |
| --- | --- | --- |
|  |   | **Threats** |
| **Probability** | **Very High 0.90** | 0.05 | 0.09 | 0.18 | 0.36 | 0.72 |
| **High 0.70** | 0.04 | 0.07 | 0.14 | 0.28 | 0.56 |
| **Medium 0.50** | 0.03 | 0.05 | 0.10 | 0.20 | 0.40 |
| **Low 0.30** | 0.02 | 0.03 | 0.06 | 0.12 | 0.24 |
| **Very Low 0.10** | 0.01 | 0.01 | 0.02 | 0.04 | 0.08 |
|  |  | **Very Low 0.05** | **Low 0.10** | **Moderate 0.20** | **High 0.40** | **Very High 0.80** |
|  |  | **Negative Impact** |

This approach on risks in the planning phase improves teams’ ability and confidence to handle uncertainty and favors a greater interaction of heterogeneous skills in team work from a transversal perspective as an engine for accelerating change.

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