Towards the agility of risk management in official statistics through the implementation of adaptive measuring system

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Abstract

Actions in the context of risk management undertaken by units of official statistics are based on well-established theoretical and practical knowledge. The objective of these activities is to develop, implement and then improve the system of identification and response to emerging threats. While developing the system, it is assumed that an orderly target state, where actions in the risk area are predictable, can be achieved. These expectations are enhanced by stakeholders of official statistics building up an image of a

reliable and credible institution which carries out its tasks in a planned manner. This vision stands in opposition to the contradictory requirements of those same stakeholders awaiting the full use of new opportunities inherent in the rapidly developing technical and organizational area. With regard to the problem posed, the article sets forth the concept of using an evolutionary set of measures to build a model of agile risk management, combining the need to obtain a stable and predictable system of response to emerging threats with a constant need to identify and exploit new opportunities.

The first part of the article discusses, in a synthetic manner, the current state of knowledge concerning risk management methodology, including normative solutions, i.e. ISO 9000 - 2015, ISO 31000 – 2009. In the further part of the discussion, we assume that the above methodology is understandable, implemented and is subject to improvement. This enables us to develop requirements to be met by the extended system described as agile. The starting point for the construction of the concept is an evolutionary set of measures for monitoring and disclosing the materialized risks, supplemented with possibilities of exploring new challenges. The final part of the article presents a case study of using the initiative to expand the pool of research methods in official statistics with Big Data solutions, where significant legal risk is combined with the need to develop and deliver new solutions to the recipients of statistical data.

Current knowledge

Risk management is a concept permanently established in the governance of formal organisations (organisation and management) as well as social (public health) and environmental (natural disasters) spheres. This concept can be linked to the strategic management science which generates principles and rules of coherent, long-term conduct. One of the perceptible outcomes of the development of the strategic management theory and practice are normative documents describing the target state of organizational solution disclosed by standards institutions. This is exemplified by the standards:

- ISO 9000[1] - Quality management systems,
- ISO 26000[2] - Guidance on social responsibility,
- ISO 38500[3] - Corporate Governance of Information Technology,
- ISO 27000[4] - Information security management systems,
- ISO 31000[5] - Risk management.

The three standards (ISO 31000, ISO 31010, ISO Guide 73), hereinafter referred to as ISO 31000, provide a key set of references for risk management. They contain consistent recommendations for developing theoretical and practical risk management models which

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[1] ISO 9001:2015 – Quality management systems – Requirements.
[2] ISO 26000:2010 - Guidance on social responsibility
[3] ISO 38500:2015 - Corporate Governance of Information Technology
[4] ISO 27000:2016 - Information technology - Security techniques - Information security management systems -- Overview and vocabulary
[5] ISO 31000:2009 - Risk management -- Principles and guidelines

are successfully used in many fields such as finance, natural disasters, public health and food safety. The suitability of a standard is expressed in a wide range of distinct application areas, which can be regarded as an indicator of consistency and foresight of the proposed approach[6]. The general concept of a standard is divided into three parts[7].

1. Principles – consist of eleven general assumptions constituting the construction of risk management models. They contain statements pertinent to the risk management objectives, e.g. „(a) [it] creates values", through means of their implementation, „(b) [is] integral part of all organizational processes" - to the methods of continual development, „(j) [is] dynamic, iterative and responsive to change".

2. Framework – indicates components of the risk management system as well as the relationships that occur between them. This concept is similar in its structure to other proven and widely used normative systems such as quality management. Here we can see a continuous process of designing, implementing, monitoring and improving.

3. Process – structures, in the form of mapping, groups of activities integrated into the implementation part of the framework for risk management. These are:

   a) basic activities, i.e.:

      i) establishing context,

      ii) risk assessment,

      iii) risk treatment,

   b) supportive activities, i.e.:

      i) monitoring and review,

      ii) communication and consultation.

   A map of ISO risk management activities is often referred to as a scheme which is adapted to the requirements of a specific area of application and to the authors' innovative concepts. Thus in the publication for official statistics, the map is visibly supplemented with risk management maturity as well as information supporting system, whereas for the cyberspace the risk mitigation has been broken down into: (i) security measures, (ii) innovation, (iii) preparedness.

It is also noteworthy that the term 'risk' has been defined in the ISO 31000 as „effect of uncertainty on objectives". What is noticeable here is a broad-ranging concept of the formulation used which enables, depending on the interpretation, the inclusion or exclusion of a particular phenomenon from the matter of interest. It is not accidental, as such approach enabled the development of an effective risk management model useful in many separate areas of human activity. This, however, requires intellectual discipline, because

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[6] Lalonde C., Boiral O., *Managing risks through ISO 31000: A critical analysis*, Risk Management, vol. 14 (2012), no 4, p. 272-300.
[7] PN-ISO 31000:2009, p. 13.

each risk category concerned requires a specialised and operationalised definition that allows for unambiguous and objective inclusion of a phenomenon to a given category, preventing subjective interpretation while focusing on effective measurement.

Risk management in the official statistics

Similarly to other areas of science and practice, the official statistics have started the process of tailoring the ISO 31000 standard to meet their own requirements. The effect of this is, inter alia, the implementation guide that is being discussed by the Risk Management Team. However, the interest on the part of executives is not accompanied by academic debate. Table 1 shows the count of entries for risk management terms cited in academic papers according to Google Scholar[8].

Table 1. Query results regarding selected risk management phrases obtained from Google Scholar service.

Phrase	Count of entries
Risk	4 490 000
"risk management"	1 450 000
"risk management" finance	784 000
"risk management in finance"	503
"risk management" "official statistics"	6 490
"risk management in official statistics"	0
"risk management in statistical organizations"	0

Source: https://scholar.google.com [25.07.2017]

The results shown in table 1 suggest that while the official statistics data are used in risk management research, it is challenging to find scientific publications focused specifically on risk management in official statistics. It is therefore worth initiating such discussion, while also expanding the range of threads that can help improve the management processes of institutions responsible for credible statistics expected by their stakeholders.

Following the ISO 31000 recommendations and definitions, risk management in the area of official statistics can be derived from the objectives set out in *Basic Principles of Official Statistics* adopted by *The United Nations Statistics Commission* on 29 January 2014[9]. Among the ten Principles contained in the document, the focus is made on trust, credibility, professionalism and statistical confidentiality, with the most highlighted statement being[10]: „official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy and the public with data about the economic, demographic, social and environmental situation. (…)" This means that the key threat to the official statistics is the mismatch and lack of practical utility of the data they generate.

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[8] https://scholar.google.com
[9] Fundamental Principles of Official Statistics, United Nation, Resolution adopted by the General Assembly on 29 January 2014 (A/RES/68/261) [available: https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx]
[10] Ibid.

Guidelines on Risk Management practices in Statistical Organizations[11] present the classification owing to which the above risk may be included to the strategic categories. The authors distinguish the following categories[12].

1. Strategic, associated with the production and dissemination of statistical data.

2. Operational, linked to HR, Finance, ICT, Procurement.

3. Compliance to law and standards.

4. Reporting, related to communication flows.

This classification, however, should be complemented, as it merely streamlines the process of risk identification in the official statistics.

The main message conveyed by *Guidelines...* is the proposal to prepare a set of recommendations enabling implementation of the assumptions. Each process indicated in the standard, i.e. setting the context, risk assessment, risk management, communication and monitoring, was thoroughly discussed in terms of how it could be tailored for organizational structures of the official statistics units. The assumptions of the standard were extended to include additional guidelines referring to:

1) organizational structures designed to carry out tasks defined by the standard [13],

2) a system for assessing the intensity of the use of risk management principles in an organization, generally referred to as the maturity system[14],

3) recommendations for the development of information systems supporting the functioning of the risk management system[15],

4) a postulate to redevelop already implemented systems in order to adapt their organizational structures to agile projects[16]; due to a controversial nature of this postulate, it will be discussed in more detail in the next chapter.

Agility in risk management

The intensity of the development of the agile concept in management science has increased interest in this subject across the statistical community. One of its effects is tackling the issue of agility in *Guidelines...* where the third part, entitled *Agile vision*, deals with Innovation Risk Management in the NSOs. Below are presented some remarks which aim to contribute to the debate about the place, role, benefits and limitations of this concept in the official statistics.

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[11] Guidelines on Risk Management practices in Statistical Organizations, UNECE, ISTAT, University of Rome Tor Vergata, January 2017.
[12] Ibid., p. 51.
[13] Ibid., p. 88.
[14] Ibid., pp. 76-86.
[15] Ibid., pp. 73-75
[16] Ibid., pp. 100-114.

1. Old concept with a new name.

   The term agile, understood as [17]: „an approach where requirements and solutions evolve through collaboration between self-organising, cross-functional teams", only slightly differs from other words previously used in similar contexts, such as flexible, adaptive, adjusted, or lean management. What is essentially innovative, however, is the way of organising production, widely used today in software development as well as in research and development.

2. Agility is part of ISO 31000.

   ISO 31000 contains two items that directly impose the implementation of agility understood as a quick and effective adjustment of the risk management system to the current and predictable reality. These are: „(i) dynamic, iterative and responsive to change" and „(k) facilitates, continual, improvement and enhancement of the organization". In addition, the need for continuous improvement has been demonstrated in the section regarding the framework, indicating iterative design, implementation, monitoring and improvement. This means that the risk management system developed on the basis of ISO 3100 should encompass both the methods of conducting traditional projects and those innovative, labelled as agile. Their choice depends on the circumstances as well as the detailed risk analysis. Therefore, the above argumentation indicates that the statement *risk management is 'out-of-date'*[18] does not correspond to the ISO 31000 actual structure.

3. The term *agility in risk management* better captures the essence of the problem than *agile risk management*.

   As shown in item 2 above, while the term risk management imposes the use of agility, the measuring system implemented in a public administration unit can assess the speed and effectiveness of the unit's response to changes in internal and external circumstances. A set of such measures can be labelled as agile and incorporated into the risk management system, thus becoming its integral part. Hence, there is no need to supplement the basic term with the additional word *agile*.

4. Software development methods are not a perfect pattern for official statistics.

   While implementing organizational solutions that are effective in other sectors of the national economy, it is vital to point out precisely how businesses operate in these areas and to skilfully take advantage of them considering the target organization's specificity. The software development sector was the place where the agile project implementation approach arose. The Manifesto[19] outlining the basic assumptions of this approach was published in 2001. It expressed criticism of errors made while implementing projects requiring detailed planning of resources and

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[17] Ibid., p. 102.
[18] Ibid., p. 103.
[19] Manifesto for Agile Software Development, http://agilemanifesto.org/

conditions, along with complete documentation of the actions taken. Many losses, waste, and chronic mismatch with the end user's expectations were then identified, in terms of time, effort, and most importantly the functionality and usability of the products. Accordingly, a change in the approach to the implementation of the project has been suggested, and named agile. The idea was received with appreciation and approval. A few years later, a large number of software development projects were implemented in accordance with the assumptions outlined in the Manifesto. Following that, numerous specialized methods for project organization which can be described as agile have been worked out[20]. It is important to realise that the result of such action is work protected by copyright. A distinguishing feature of this type of product is limitation of the producer's liability. There is no guarantee or warranty regarding copyright, which means that the producer's focus on final compliance with the requirements and quality may be lax. Factors other than legal constraints cause that this obligation is not completely neglected. Any type of errors resulting from the omission of control and supervision procedures has a lesser impact here than in companies operating in other service sectors or in manufacturing. High level overview of the functioning of the official statistics points to the fact that it belongs to the public administration and performs its tasks within the extents and limits of the statute. This means it may only take those actions that result from the regulations. The private sector, on the other hand, can implement any actions that are not prohibited by the law. In the context of risk identification and analysis of agile approach, it makes a fundamental difference, limiting the freedom of the public sector. In addition, the presentation of statistical data resulting from processes with relaxed supervision and control could have serious social and reputational consequences. There are fundamental differences in the functioning of both sectors of activity, thus preventing the immediate transfer of organizational solutions.

In view of the above, it is important that debates on the implementation of new, innovative methods of organizing work of the official statistics should take account of the wide range of their impact.

Assumptions of adaptive measuring system

Agility in the risk management of official statistics is supported by the information system[21] underlying the effective functioning of the measuring system. Its development is conditioned by the assumptions discussed above. The most important of them is the statement that a detailed definition of risk should be prepared for each category, thus allowing the indication of measurement methods, the source of data acquisition and the way interpretation is presented.

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[20] Scrum, extreme programming, lean-software development, test-driven development are examples of such methods. Each of them focuses on selected techniques for improving the efficiency and effectiveness of software development processes, e.g. test-driven development requires the preparation of a set of unambiguous tests to assess how the output meets expectations.

[21] Guidelines…, op. cit., p. 73 - 75.

Guideline... outline the classification of threats[22]. It does not exhaust many possible variants. The presented sources of risk identification are as follows:

1) scientific knowledge,

2) experience and

3) predictable reality.

Developing the strategic risk category, it is vital to highlight the principles adopted by the *United Nations Statistics Commission* and to point out the threat of mismatch and lack of practical utility of data generated by the official statistics. In this regard, there is a steady development of the scope of presented data which are constantly enriched in economic, social and environmental spheres. Such is the conviction of the statistical community. It should, however, be validated by evidence derived from specific measures, for example, the feedback collected during surveys. The respondents' opinions become the basis for reviewing the current activities. An additional source of risk identification in this area may be the observation of current phenomena while trying to answer the question whether the official statistics adequately respond to the emerging threats. Let two events serve as an examples: the 2008 financial crisis and estimation of Ireland's GDP in 2015.

Due to the 2008 crisis, the official statistics were severely criticized for failing to provide signals to help diagnose emerging macroeconomic imbalances. In response to this criticism a lot of work aimed to develop additional warning indicators was initiated. One of the effects was the EU Macroeconomic Imbalance Procedure (MIP), introduced in 2011 by the Regulation of the European Parliament and of the Council[23]. The question arises whether these actions are sufficient. Additional opinions are being heard that whilst useful and practical, these measures are insufficient as they do not describe the radical changes in global and national financial flows. The core aggregates prepared by the official statistics, i.e. national accounts, do not provide adequate data to describe the phenomena occurring in the economy. This thesis can be illustrated by another case: in 2016, the National Statistical Office of Ireland reported a 26.3% GDP growth rate as of 2015, earlier estimated at 3.5%. Economic journalists, seeking for reasons of such a large disproportion between estimates and real dynamics, put forward only hypotheses of limited possibilities of reference to aggregates of national accounts. The examples of possible reasons presented are[24]: (i) intellectual property rights movement; (ii) leasing firms movement; (iii) international outsourcing within companies operating in high income sectors, such as manufacturing of medical equipment. Let us look at the examples of these phenomena presented in economic journalism. A business model of new passenger aircraft usufruct includes their leasehold, without the transfer of ownership. At the same time some of their

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[22] Ibid., p. 51.

[23] *Regulation (EU) No 1174/2011 of the European Parliament and of the Council of 16 November 2011 on enforcement measures to correct excessive macroeconomic imbalances in the euro area* and *Regulation (EU) No 1176/2011 of the European Parliament and of the Council of 16 November 2011 on the prevention and correction of macroeconomic imbalances*

[24] Taylor C., Ireland's GDP figures: Why 26% economic growth is a problem, The Irish Times, Jul. 15, 2016 [available: https://www.irishtimes.com/business/economy/ireland-s-gdp-figures-why-26-economic-growth-is-a-problem-1.2722170]

parts, for example, engines are in use under a separate leasing contract, while still owned by a manufacturer or a designated undertaking. Such practices, which might have an impact on national accounts, begin to dominate in many areas of economic activity. It is difficult to monitor their outcomes by means of old paradigms for building national accounts. They should therefore be constantly reviewed and updated in terms of their suitability for the description of current phenomena. Relating the above analysis to the risk measuring system, it is worth noting that both quantitative (surveys) and qualitative measurements (literature and publications) prepared for the risk of mismatch between the statistical data and the recipients' needs should be adapted to a specific risk category.

Another area of risk in the strategic category is research and development. It is often associated with methodological work carried out to widen the scope of released data as well as to transform those currently presented. This applies especially to new data sources, e.g.:

1) administrative registers – collecting data available in the public administration satisfying the needs of official statistics,

2) Business transaction data

    a) retail chains – for price statistics,

    b) transport companies – for freight and passengers traffic statistics,

    c) telecommunication operators – for the purpose of estimating the volume and direction of population movements,

3) satellite imagery – for crop recognition,

4) Big Data – for the needs of acquiring data from the internet regarding consumer sentiment and verification of business registers.

The official statistics risk infringement in all these areas, as some of them have not been explicitly defined by the law. This is mitigated by the inclusion of legally permitted R & D activities, while initiating legislation to introduce the possibility of collecting data in a clearly defined scope.

Resume

The concept of risk management has become a permanent part of the official statistics' governance system. The available ISO standards and recommendations put forward in *Guidelines...* allow for effective implementation of this system. The next stage in the discussion is to launch an iterative process of improving initially introduced solutions. They can be evaluated using the maturity index proposed in *Guidelines....* Another area which can help in assessing the agility of official statistics units is the fulfilment level of the recipients' conscious and unconscious needs. Concentration on satisfying these needs automatically generates innovative ideas which translate into R & D work finalised with their implementation process. An adaptive measuring system combining specialized indicators adapted to a defined risk area and scope of collected data may uphold the compliance of these actions with general principles of official statistics.

Remarks

This work expresses the author's personal opinion. It does not represent an official viewpoint of any NGOs

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