I. Introduction

1. At present, in the age of IT innovation, the reality mounts new challenges to public statistics. In order to implement them and strengthen the challenges and growing needs of recipients, changes in the way the public statistics operates are necessary. It is, after all, not only the key element functioning within the IT system of the state but also European statistics. What is also relevant, is the exploration and appropriate use of the new possibilities that are, at present, offered by the growing dissemination of data and dynamic development of new technologies.

2. Concept of Statistical Surveys Organization in the CSO of Poland requires taking action aimed at increasing the efficiency of the statistical production process and accompanying organizational and coordination processes. To achieve this goal a lot of activities must be taken, out of which three main ones, taken with the view of making the organization more efficient, are as follows:

   (a) Identifying and establishing processes within the particular stages of official statistics, based on the Generic Statistical Business Process Model - GSBMP¹ and preparing the Polish Integrated Statistical Business Process Model (ISBPM), that includes models appropriate to reality and the needs of Polish official statistics; specifying the vision of implementing statistical surveys standard of integrated statistical production process taking into consideration metadata objects.

   (b) Standardizing organizational processes, which is based not only on ensuring uniform solutions regarding data collection and processing, but also on implementing the entire statistical process according to uniform principles and procedures.

   (c) Preparing the procedures that make it possible to automate planning processes and survey implementation.

   (d) Implementing the concepts, rules and procedures in stages, with regard the possibilities and human and financial resources.

   (e) Preparing and implementing in stages data collection strategy as well as data storage, processing and dissemination.

¹ www.unice.org/stats/gsbpm
(f) Defining goals and requirements for the metadata system and the analysis of potential use.
(g) Preparing and stage-wise implementing the meta-information concept that enables the use and creation of meta-information on every stage of the statistical process as well as management of the access, users and the quality of meta information.

II. Enterprise Architecture

3. Enterprise architecture is a formal description of the organization components structure and function, the relationships between these components as well as the principles and recommendation for their over time creation and development. The organization component is any component used to construct the organization (it can be people, processes, physical structure as well as IT systems).

Typically, enterprise architecture consists of 5 components (ref. TOGAF – The Open Group Architecture Framework) such as:

- **Enterprise Architecture Principles** – the collection of permanent principles based on the organization development strategy, which shows the comprehensive needs of the organization in creating IT solutions,
- **Business Architecture** - defines the business strategy, ways of managing the organization, (governance, organization), organization structure and key business processes as well as relationship between the components,
- **Data Architecture** - describes types and data sources necessary for the organization functioning,
- **Application Architecture** - describes individual applications to be deployed, their interactions, and their relationships to the core business processes of the organization.
- **Technology Architecture** - describes the technical infrastructure which is the basis for functioning of key software (this includes operating systems, database management systems, application servers, hardware and communications infrastructure, etc.).

4. Organization of public statistics should create a coherent system, i.e. a set of elements which are mutually correlated and which construction, functions and links ensure the most efficient functioning of the entire structure. Efficient functioning of statistical survey organization means in particular delivering the expected products and statistical services to the recipients, while observing the required number, quality, timeframe and budget. Modern public statistics imposes a strong pressure on increasing that efficiency, i.e. it regards the need to deliver new products faster and cheaper with less burden on the respondents.

5. In such a context public statistics can be equated with “the enterprise” (“*Each statistical organization is a factory of statistical information*”), in which statistical surveys can be acknowledged as the so-called basic operations of the enterprise – having the decisive influence on its efficient functioning. Analysing the statistical surveys system organization and in particular potential possibilities of improving it, it seems that it is not possible to obtain significant positive improvements concentrating only on a single element of the entire system. This is the result of the elaborateness of the public statistics organization system, the elements of which influence one another and every change of each element leads to a change in the entire system’s functioning.

6. Based, among other things, on the experiences acquired in the preparation and conduct of the last round of censuses, e.g. the agricultural census and the population and housing census observations regarding the management of organizations, specialist, domestic and international documents point to the fact that the positive effects of making the public statistic organization system more accessible can be achieved with well coordinated actions regarding:

1) Increasing the efficiency of work processes within public statistical units (the effect of which are final products and statistical services);

2) Optimization of organizational structure of public statistics;

2 Efficiency – possibility to constantly adapt to the changes in surroundings and a productive and efficient use of resources to implement one’s targets (ref. “Administracja publiczna – Skrypt”, red. J. Gierszewski, PWSH Pomerania, 2012).
3 Strategic vision of the High level group for Strategic Developments in Business Architecture in Statistics – Note by Statistics Netherlands, with input from Statistics Norway and UNECE, Meeting on the MSIS, Luxembourg, 23-25 May 2011
4 “Procesy podstawowe” – ref. np. procesy w administracji publicznej przedstawione w: „Wspólna Metoda Oceny (CAF) – Doskonalenie organizacji przez samoocenę” – wydanie 2, MSWiA/MAiC, 2011. [„Basic processes” – ref. e.g. processes in public administration presented in: “Joint evaluation method – perfecting the organization through self-evaluation”]
3) Modernization and development of IT in public statistics.
The above actions should go hand in hand with:
4) Development of the knowledge base, which, combined with innovativeness, should be a key factor of
development of public statistics.
The activities presented above (point 5-8) should be accompanied by:
5) constant identification of needs of recipients of products and public statistics services,
6) monitoring of the possibility to collect (from suppliers) data or public statistic services;
7) adjusting legal regulations ensuring an efficient functioning and development of public statistics;
8) securing the sources of financing for the planned and exercised activities.
For all activities presents from 1) to 8) as well as all processes of statistical surveys the following should be
ensured:
9) efficient coordination.

III. General Model of Public Statistics

7. As mentioned earlier, the organization of public statistic surveys should create one coherent system. Among
the key elements of this system one should mention:

(a) work process;
(b) organizational structure;
(c) tool infrastructure (= IT);
(d) knowledge base;
(e) recipients of products and services of public statistics;
(f) suppliers of services and data for public statistics;
(g) legal regulations;
The entire system requires efficient coordination and protection of sources of financing.

Fig. 1 – Idea model of operation of public statistics

8. The above mentioned elements remain related. Potential changes in the programme of statistical surveys of
official statistics, especially those regarding the improvement of efficiency, should be prepared comprehensively
with regard to each of the above elements.

IV. Framework of the Corporation Architecture

9. A holistic view on the organization provides methodology defined as Enterprise Architecture. To represent
a systematic mode of action of enterprise architecture action the Enterprise Architecture Frameworks are used,
which are the specific set of instructions and specifications used for the construction of enterprise architecture in
organizations.
10. The framework of Corporation Architecture in the CSO of Poland covers the entire transformation from
the current surveys organization model, based on a stovepipe model, to the Integrated Statistical Business
Process System, which will be fully implemented by 2020.

The process approach has been for many years developed within the public statistical organization where the generic statistical business process model was prepared (GSBPM), which was considered as standard and is successfully developed and implemented around the world within numerous public statistics organizations. In principle, GSBPM acknowledges all activities undertaken by the producers of official statistics on the national and international level, which end with obtaining statistical products (data). GSBPM is based on knowledge and experiences of many years standing, acquired through implementations in a few dozen countries around the world. It ensures completeness and universality of the model. It addresses the issues of interoperability. The elements of the GSBPM model are already used in Polish public statistics – they are used individually and independently with regard to particular studies. Such an approach creates numerous implementations of the GSBPM model. It results from the analyses conducted thus far that the GSBPM covers the needs and conditions of national public statistics and after appropriate adjustments would be also adapted to the construction of the new Integrated Statistical Business Process Model.

The future organization of public statistics should be based on the so-called process approach – using the familiar and successful solutions, i.e. GSBPM. Among the basic features of the mentioned process approach one can mention:

(a) Concentration of entire activities within the organization of statistical public surveys.
(b) Adapting a perspective of the “from the outside to the inside” analysis, based on taking client’s expectations as a departure point with regard to a product which is to meet these expectations.
(c) Firstly, concentration on relations (so-called “interfaces”) between particular processes and organizations, secondly, looking at the inferior of the organization or the process.
(d) Activities (in particular processes) should end with a well-defined (qualitatively and quantitatively) product (half-product or final product).
(e) Activity (especially processes) should start after receiving a well-defined (quantitatively and qualitatively) initial product or half-product, so-called “input”.

The presented solutions, are aimed at increasing efficiency of processes of the public statistics organization system while preserving their effectiveness. It seems that the increase of efficiency can be achieved through:

(a) Optimization and standardization of labour processes.
(b) Tasks specialization of organizational units.
(c) Consolidation and unification of IT solutions.
(d) Optimization of the collecting data manner– single time collection of variables added value used simultaneously in many surveys.
(e) Maximal use of already used information – e.g. information available in the registers of public administration.
(f) Minimization of the use of “costly” methods of data collection – i.e. by respondents;
(g) Minimization of data collection social costs – i.e. limiting engagement of respondents.

B. The Integrated Statistical Business Process Model

14. The concept of the model of statistical surveys is based on the perspective of work processes. The description of fundamental elements of concept solutions was presented while discussing particular groups of model processes including: specification of needs, designing, construction, data collection, data processing, data analysis, data dissemination, archiving and ex-post evaluation.

15. Organization of surveys of public statistics requires a holistic approach – in particular looking through the prism of a single survey but also through the prism of all surveys and, as was already signalled earlier, drawing attention to the fact that the effect of the entire organization does not have to be simply a sum of particular effects and can be, in a major way, strengthened thanks to the synergy effect. From our analysis it can be inferred that it is possible to significantly simplify the architecture of work processes – i.e. reduction of numerous independent production processes with single processes (Picture below) – in particular thanks to implementation of task specialization and related competence concentration.

Fig. 3. – Target model of statistical production

16. Taking into consideration all observation – including the possibility to secure the proper management of work processes – it seems possible that a certain improvement (and simplification) can be performed on the organizational structure of the organization system public statistics, where in the place of “silos” one should introduce organizational units with the following task specifications (functional) – i.e. specialization regarding:

   (a) data processing;
   (b) data storage;
   (c) data analysis;
   (d) data dissemination (i.e. customer service);
   (e) organization, coordination and control;
   (f) providing IT services.

17. Activities of the aforementioned “specialized” units (further referred to as key units) require also the support from help units – dealing with managing staff, servicing administration and finance. Along with the implementation of specialized units it will be required to appropriately organize them e.g. by creating appropriate profiled teams with precisely established team roles, preparing work and creating action procedures.

18. Invoking the idea of a holistic approach to the organization of statistical surveys, one should pay attention to the fact that the structure of work processes should be strictly correlated to the so called “production environment” used within the same processes. In the case of the public statistics the production environment is, first and foremost, consisting of the IT solutions used to gather, process, analyse and disseminate data. The used
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solutions to a large degree impose the way of conducting numerous activities ("because it cannot be done in any other way"). The significant number and diversity of solutions determine numerous (understood as lack of standardization) of activities performed within the work processes of statistical and public surveys.

19. The idea of reorganization presented herein is strictly related to the need for change of the production environment of public statistics surveys organization. It seems that the integration, consolidation and standardization of IT solutions – within one unified production environment – will be an effective method of supporting reorganization, optimization and standardization of work processes. Additionally, the mentioned consolidation of IT solutions should, in a major way, influence the optimization of development costs of those solutions and their later support.

20. The proposed changes of organization of surveys of public statistics, aims at transferring the organization into an organization depicted in sector-specific publications as “Functional organisation” and at creating the so-called integrated statistical business process system.

C. Organizational structure and key tasks

21. Organizational structure is a relevant element of the proposed Integrated Statistical Business Process Model which should be coherent with the concept proposed and described in previous chapters. It is also relevant to enable and support positive effects that it brings. According to the process groups and processes we can distinguish between basic units:

(a) Control, coordination and organization Unit;
(b) Data collection Unit;
(c) Data processing Unit;
(d) Data analysis Unit;
(e) Customer service Unit;
(f) IT services Unit supported by supporting units (dealing with staff management, administrative and finance management).

![Fig. 4. Basic units of the Integrated Statistical Business Process Model](image)

22. The basis assumption determining the multi-layer structure proposed herein is the concentration on specifically identified uniform tasks for task groups implemented within work processes in the integrated task implementation model followed by focusing - within a particular organization unit - on knowledge, experience and competence necessary to perform these tasks. It should also be underlined that at this moment this concept does not define details of organization and their structure, it presents only certain directional ideas which will require further work. Therefore, no inner organization of these units was specified. No specification was given as regards whether they will be characterized by a flat structure or will they consist of smaller units specialized according to certain criteria. Supportive units mentioned above will not be discussed within the organizational structure.

23. One of the main tasks within the Integrated Statistical Business Process Model will be the comprehensive ensuring of efficiency the entire string of activities regarding the exercise of statistical surveys. It is important
that the safeguard of integrity of the statistical processes was the unit having appropriate competence allowing it for an efficient coordination of the proper cooperation of all remaining basic organizational units. Therefore the owner of the string of process groups was the control, coordination and organization Unit (i.e. unit responsible both for its entire result as well as for defining and monitoring the measures of its efficiency, entire management of the string of process groups, defining its course etc.). Its tasks in this scope should include coordination and monitoring of the entire work performed by all units within one process string (including concentration on “interfaces” between particular process groups), and in particular coordination of management of escalating problems regarding cooperation of units (i.e. concentration on the cooperation between particular units). Therefore, the task of this units will be as follows:

- monitoring that within the string of process group the user information requirements and needs were well identified and defined;
- observing that within the particular process groups appropriate plans were created and maintained;
- monitoring the status of particular plans implementation;
- collecting applications and experiences from the finished editions of surveys in order to implement improvements and optimize future survey editions.

24. A relevant support role for the control, coordination and organization Unit should be played by the CSO management which suggests that it should guard the process approach in the Integrated Statistical Business Process Model (including support in the case of significant problems and issues requiring escalation on a higher level of the CSO organization) on the level of the entire organization.

25. Apart from the above described managerial role of the control, coordination and organization Unit, within the entire string process of the Integrated Statistical Business Process Model, the unit plays analogical role on a lower level, i.e. few process groups. It is responsible for the verification and confirmation of the plans prepared by particular units within the process group (plans regarding: construction, production, quality archiving and requirements regarding IT tools and services within the scope corresponding to the competence of a given operational organization), creating a collective performance plan, therefore it is proposed that it played a role of the group owner of the designing processes. Within the Construction process group the control, coordination and organization Unit performs the decomposition of the common implementation plan and directs the composite plans to further implementation by key units taking part in the statistical surveys. Due to the implemented tasks and the fulfilled role it is proposed that this unit was the owner of the Construction process group. Taking into account that the defining quality standards, analysis and ex-post evaluation refers primarily to the entire string of processes of the Integrated Statistical Business Process Model, the control, coordination and organization Unit coordinates the entirety of the performed works performed by all units within the ex-post evaluation processes group, therefore it is proposed that it was the owner also of the process group. In the context of the remaining process groups (which the unit does not own) it fulfils the monitoring role.

26. The fundamental task of the data collection Unit is to gather, on the basis of the necessary preparation, by the data processing Unit different data collections with the use of the most adequate methods of obtaining data. The products of this unit are the data collections gathered for the statistical products group with the appropriate Frames and are transferred to the data processing Units. In the case of obtaining the report on errors detected on the stage of data Processing or data Analysis it is obliged to fulfil/ correct the micro data. Data collection Unit creates and subsequently, after being acknowledged by the control, coordination and organization Unit, implements the construction plan regarding obtaining data and production plan regarding obtaining data. Additionally, the unit has an input in the archiving plan and the quality plan in the scope of obtaining data. In relation to the range of implemented tasks it is proposed that this unit was the owner of the process group of data collection.

27. The fundamental product of the work of the data processing unit is the micro and macro data Repository appropriately prepared and fulfilled with data. One of the tasks is to analyse the needs of the data analysis Unit. This need refers to the aggregates and need for resultant micro data of statistical products groups and processing of the obtained data (i.e. value collections of variables collected for the statistical products Groups) into a collection of data constituting the basis for preparing information and conducting analyses. This unit creates and implements the construction plan of production as well as operational and analytical processing of micro data. Additionally, the data processing Unit has an input in the archiving plan and the quality plan in the scope of processed data. Due to the scope and specificity of the implemented task, it is proposed that this unit was the owner of the process group of data Processing.
28. The main task of the **data analysis Unit** is delivering to the **customer service unit** products based on the needs on its part for the statistical products. This task is implemented on the basis of a detailed data analysis, implementing the statistical confidentiality principle and final confirmation of data that are to be made available. The fundamental result of the work of the units should be the groups of publication aggregates and the product groups statistically recorded in the analytical micro and macro data repository (data Warehouse). **Data analysis Unit** prepares and then, after acknowledgment by the **control, coordination and organization Unit**, implements the construction and production plan of data analysis. Additionally, the data analysis Unit has an input in the archiving plan and the quality plan in the scope of data analysis. In relation to the scope of the implemented tasks it is proposed that the unit was the owner of the data Analysis process group.

29. One of the tasks of the **customer service Unit** is the preparation of statistical project products, on the basis of the information needs identification (i.e. requirement specification regarding the products fulfilling the identified information needs of statistical information recipients). These statistical project products create the needs for statistical products. The second key task is making statistical information available in the form of final products prepared in the statistical production processes, including their transformation to the selected availability form (printed publication, electronic format). A relevant element of the unit’s activity should be also the promotion of offered public statistics products. **Customer services Unit** prepares, and after confirming by the control, coordination and organization unit, implements the construction and production plan of data dissemination. This unit has also the input in the archiving and the quality plan in the scope of the data dissemination. Due to the specificity of the implemented tasks by the **customer service Unit**, it is suggested that it was the owner of the needs specification process group and the data dissemination process group.

30. **The IT services unit** was classified as organizational unit. That was mainly due to the relevant role of IT solution that it delivers and maintains which help in effective support of the activities of remaining units. Ultimately, that activity has an influence on the efficiency of the entire production process of public statistics. The **IT services Unit**, on the basis of requirements regarding the tools or IT services specified by all remaining units, prepares and then after being acknowledged by the **control, coordination and organization Unit**, implements the construction plan of IT tools/services, maintenance of IT tools/services regarding production, maintenance of IT tools/services regarding archiving and quality plans regarding the maintenance of tools/IT service. In the context of IT tools construction processes, this unit exercises, adjusts, tests and implements a set of tools and IT services, while in the scope of maintaining IT tools/services, ensures continuity of work of the entire IT environment supporting the work of the remaining units. In relation to the specificity of tasks implemented by the **IT services unit**, it is proposed that it was the owner of the IT tool/services designing process.

31. The proposed and above described structure exerts pressure, just as the statistical surveys organization concept, on functional specialization (i.e. criterion of the division is the role that this organization fulfils in the public statistic processes and the concentration, within given unit, of knowledge and competence necessary for implementation of the ascribed tasks group) and is strictly related to previously described conduct of work processes.

32. In order to proceed to the CSO organizational status proposed herein, it is proposed to use the gradual approach, i.e. step-by-step and stretched in time. Such an approach seems justified not only by the scope of changes but also by the fact that the proposed changes will require proper preparation (including motivation) of people engaged in this process. People constitute the fundamental capital of the organization, which, if appropriately organized and directed, determines the success of each organization functioning. People – with their knowledge and willingness to conduct creative operations – shape the organizational culture and formulate action strategies and implement them. The effective use of the proposed competence and the development of new ones constitute a key success factor for the process of proposed organizational changes.

IV. **Framework plan of reaching the Integrated Statistical Business Process Model in Poland**

33. Within the plan of accessing the Integrated Statistical Business Process System one proposes the following phases:

(a) Phase 1 – Preparation;

(b) Phase 2 – Pilot of concept along with the transformation preparation;
The above presented aspects changes/transformation will be inseparably connected to successive implementation of new work processes envisaged for the Integrated Statistical Business Process System.

34. The orientation schedule for the access to the Integrated Statistical Business Process System was presented in the diagram below. Authors assumed that the work on the implementation of the Integrated Statistical Business Process Model could be initiated already this year. Achieving the target goal is estimated at 2020 – then the implementation of all surveys will take part in the already new Integrated Statistical Business Process System. The above mentioned estimate seems optimistic – this issue will require further work. Ending the transformation until 2020 may have relevance in particular due to the subsequent edition of censuses, which could be conducted already in the new Integrated Statistical Business Process System.

35. In the above phases, particular attention should be paid to such aspect as:

(a) gradual increase of share of surveys performed with new methods of implementing statistical surveys in relation to the general number of surveys;
(b) evolutionary transformation of the organization;
(c) evolutionary transformation of the IT environment.

36. The aim of the Phase 1 should be to fundamentally prepare grounds for accessing the Integrated Statistical Business Process System. Within this phase, one should perform in particular such tasks as:


38. The aim of 3rd phase is to safeguard the continuation of surveys performed as pilot study and subsequent re-verification of the validity of the concept of the Integrated Statistical Business Process Model, implementing corrections and performing transformation plan update.

39. The aim of 4th phase is the final transformation of the statistical surveys organization system into a target Integrated Statistical Business Process System in particular in such areas as: 

- Organization structure
- Work processes
- IT environment

40. Initially most of the surveys implemented in the present structure of the statistical surveys organization system with the use of the present IT environment and according to the work processes corresponding to the present methods of the statistical survey implementation. In subsequent years – increase of surveys implemented with the new methods, used by the Task Group which used the new IT environment supporting the Integrated Statistical Business Process Model.
41. At a certain point in time a “tipping” point will be reached where most surveys will be implemented with the use of the new Integrated Statistical Business Process Model, performed by the new organization of surveys and supported with new IT environment – i.e. already within the Integrated Statistical Business Process System. At this moment the so far Task team will be dissolved. Its place will be taken by the already operating task team, which task will be to safeguard the performance - “the old way” – of those surveys which will not be transferred to the new model of statistical surveys implementation. These surveys will be conducted with the use of the elements of the present IT survey environment and according to the work processes corresponding to the present models of implementing statistical surveys.

42. The 5th phase means that the status in which the public statistics functions already in the target Integrated Statistical Business Process System was reached, i.e. all surveys of public statistics will be performed according to the new, outlined herein (and detailed in the 2nd phase) - Integrated Statistical Business Process Model, i.e. already:

(a) in new organizational structures;
(b) according to new work processes;
(c) in new IT environment.

In this phase special pressure should be placed on the successive increase of the quality of performed surveys and the improvement of the way of performing them within particular editions of statistical surveys.

V. Summary

43. One relevant element of the programme of statistical surveys of official statistics (see Fig. 1) necessary for its proper functioning is the tool infrastructure. In the case of public statistics IT tools/environment play a key role; therefore the foremost task is to ensure effective, comprehensive IT support with implementation of particular work processes included in the Integrated Statistical Business Process Model. Having these aspects in mind, while specifying the structure and composite elements of the IT environment the following principles were observed:

(a) ensuring an effective and efficient support for the implemented tasks / processes - including by appropriate adjustment of the IT infrastructure to the implemented processes;
(b) optimization of the investment efforts – also by:
   • the use (e.g. by adjustment) of the validated solutions of already functioning organization,
   • integration and consolidation of IT resources (i.e. centralization of processing and management of data and applications) with the simultaneous ensuring of access to services and dissemination of data in the entire organization, and
   • ensuring the possibility of a multiple use of created elements of IT environment;
(c) maximal use of the possibilities offered by the modern IT.

44. Implementation of the described changes concepts constitutes a strategic decision, bringing benefits in the perspective of many years. Still, as in the case of every organizational transformation it is related to certain costs, therefore making a decision on enacting the Integrated Statistical Business Process Model should be naturally preceded by a further, more detailed analysis of the benefits and costs. However, comparing the present conditioning, in which the public statistics functions, with the benefits stemming from the use of the proposed solutions, a great potential seems to be lurking in the proposed model.

45. A valuable reference point is also the positive experiences of other states, which successfully and beneficially took up modernization of public statistics within national structures, based on the principles of process approach and the GSBPM model.

46. It should be borne in mind that due to the scale and significance of the proposed concepts of changes, a key thing for the success of the implementation of this concept are such aspects as: proper communication and the promotion of a new approach to organization, “imbuing” the will to change, building confidence, motivation as well as decisiveness and the possibility to initiate legal changes. Therefore, it is suggested that the task of implementing Integrated Statistical Business Process Model was enforced highly in the organizational structure of CSO, i.e. by the high level directors.