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Topic (i): How IT can contribute to changing organizational culture

## **Streamline, Standardize and Automate Statistical Data Processing Case Study**

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### **I. Abstract**

1. The paper presents a case study on pilot implementation of components of a streamlining strategy<sup>2</sup> for statistical data processes within the IMF Statistics Department. The streamlining of “Coordinated Portfolio Investment Survey” (CPIS) was taken up as a pilot implementation to validate the strategy and identify areas that would require attention during the migration process of the entire statistical domain

### **II. Business Context**

2. In the wake of the 2008 financial crisis, the international community identified important data gaps that needed to be filled in order to create a global information system suitable for monitoring global financial and nonfinancial flows and positions comprehensively, as well as monitoring the ongoing impact of inter-connectedness. In particular, the report *The Financial Crisis and Information Gaps* prepared by the staffs of the Financial Stability Board (FSB) Secretariat and the Fund and endorsed by the Group of Twenty (G-20) Finance Ministers and central bank Governors in November 2009, identified areas of data collection and processing that would need to be addressed by the IMF and other international organizations. Primarily in response to this G-20 Data Gaps Initiative (including new datasets on sectoral accounts from other international organizations and enhancements to many existing data collections), it is anticipated that the volume of data processed by the IMF Statistics Department will increase by a factor of four over the next five years.

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<sup>1</sup> The views expressed herein are those of the authors and should not be attributed to the IMF, its Executive Board, or its management.

<sup>2</sup> Ref: Strategy paper presented in MSIS 2013 – Meeting the future demands of a Statistical Organization(IMF) (<http://www.unece.org/stats/documents/2013.04.msis.html>)

3. To meet this significant increase in the level of service stemming from the recommendations of the G20 Data Gaps Initiative and the other anticipated increase in demand within existing budgetary resources, the IMF Statistics Department needs to redesign its business processes and extend the capabilities, scalability, accuracy, reliability and timeliness of strategic business operations.

4. The IMF Statistics Department will present its initiative to transfer operations to a significantly more functional platform, introduce automation and automated decisions, streamline and standardize existing business processes, increase business user autonomy in the management of their business processes and mitigate technology risks associated with using STA-specific tools and technologies.

### III. Overview

5. The following is an overview of the pilot implementation of the streamlining strategy for the CPIS dataset managed by the IMF Statistics Department (STA).

- (a) Design and implement all components of a standardized and flexible business process
  - Support all statistical functions
- (b) Support increased demands and better timeliness of data and metadata delivery
  - Support the increase in the CPIS dataset (almost double) due to expanded coverage and demand from business users of turning around processed data with aggregates within minutes of receipt of data as compared to overnight.
  - Identify critical areas of focus to ensure the successful implementation of strategy across all data domains

### IV. Objectives and Goals

#### A. Design and implement all components of a standardized and flexible business process

6. Our streamlining strategy strongly recommends a generalized approach that could be reused across statistical products while accommodating the domain specific necessary specializations allowing the operations to scale up to the desired levels. An exercise of this magnitude will span across multiple years, impacting people, processes and tools with a significant investment, which makes it critical for achieving the desired results. The design of the future model is critical and the following items are highly recommended to be better prepared for the implementation phases:

- (a) **Business process change and not IT tools implementation:** The streamlining effort impacts all the staff including the business owners and affects the way the data managers are currently performing day to day operations. Implementation of IT tools is a significant part of effort but not the most critical for the success. The new process and its impact should be well documented and communicated at all levels to get the necessary buy-in before embarking on the change implementation.
- (b) **Enterprise data/metadata model:** A common data model is critical for streamlining of statistical operations. This not only simplifies the complexity of the technology implementation, but also significantly makes it simpler for users to understand the data and use common tools across datasets. Getting data from external sources in different data models is common, but it is necessary to transform the data to the common data model at the time it gets into the collection system. The data model continues to be same across the data process and is disseminated in the same structure. The data model should offer easy extensions to support the analytical needs of the users.

- (c) **Identify areas of automation and standardization:** As a part of the streamlining exercise it will be critical to identify areas where manual steps can be minimized and higher levels of automation can be achieved. A transition to a highly automated setup is desirable but would require necessary validation steps in the process; more so during the transition phases. To meet this requirement it is recommended to standardize data and process validation reports for each step of the data lifecycle and make available to business, data and IT users.
- (d) **Identify/Prepare the IT tools:** Being a business process change exercise it will be critical to ensure the time spent in the IT tools implementation is minimal. Delays in the development of tools will slow down the implementation and reduce the confidence in the business users. It is highly desirable that the tools are prepared in advance of the business process change initiative and during the change implementation the IT tools are used as is.

Based on these key principles a standard production process template (Appendix) was designed, data model was created and existing IT tools were enhanced to meet the requirement. The pilot implementation for CPIS dataset was released to production leveraging these efforts.

## **B. Support increased demands and better timeliness of data and metadata delivery**

7. To validate the approach for streamlining before implementing across all statistical domains, it was recommended to implement the new processes on a pilot dataset. There were two possible options for the pilot implementation – 1) Parallel run to compare and validate an existing dataset; or 2) New dataset. First approach would be safer but could result in possible delays due to conflicting priorities, while the later approach poses high risks by relying solely on new processes and tools.

8. CPIS dataset required a major change due to the expanded coverage, which almost doubled the size of the dataset. The change was impacting all full data process including collection, processing and dissemination. After an initial analysis it was confirmed that the existing tools and processes will not be able to deliver the desired results in the expected timeframe. Hence the expanded CPIS was taken up as the pilot implementation for the new streamlining exercise. Some of the key items of the pilot implementation are below:

- (a) **Support for increased data demand:** The new CPIS dataset expanded the data coverage to approx. 34,000 series per country from 17,000; almost doubled. This increase in size posed three immediate demands:
- i. **Reduce the size of report collection forms:** The old report forms were quite big and countries with low bandwidth consistently faced download issues. Same reports forms with increased data coverage would be unsustainable for such countries. New report forms were designed with simpler structure and format for expanded dataset; which resulted in significant reduction in the size making it easier for the member countries
  - ii. **Just in time processing:** The data was processed on receipt without wait and results were shared with the business users to validate, which used to be an overnight process in the previous system. This helped the business users to get back to the data correspondents from member countries in a timelier manner.
  - iii. **Readiness to disseminate data real-time:** In the new implementation, the users within the IMF can access the data received from the member countries almost real-time, which was not possible earlier.
- (b) **Automation and easy data validation:** The new implementation has eliminated most of the manual steps by implementation of automated workflows. Submissions with no data issues pass through all the way to pre-dissemination without any manual intervention. Submissions with data issues are made available to business users through standardized validation reports. These reports allow users to immediately look into the issues than eyeballing the full data submission, saving significant time. On

need basis the users have a flexibility to deep dive into data using tools that offer analytical and visual capabilities.

- (c) **Transparent workflow:** The business users can easily track the status of the data submission through the data workflow dashboards. This offers transparency and extra flexibility.
- (d) **Performance improvements and access to business user tools:** The data processing time was significantly reduced to 15-20 minutes as compared to 7-8 hours. New tools offer full business user autonomy and time saving by making it possible for users to do many of the tasks which were earlier done by IT staff.

### C. Identify critical areas of focus to ensure the successful implementation of strategy across all statistical processes

9. The successful implementation of the new process and tools for the expanded CPIS demonstrated the benefits a statistical operation can achieve by leveraging standardization and automation. To expand this approach to all data processes some key areas need to be addressed.

- (a) **Organizational structure:** It was noted and as also suggested in the strategy paper, a process centric organization structure is better suited to get the maximum benefits of streamlining. It would require detailed planning to move from a product-driven structure to a process-driven organization, and may require a transitional organization in between to mitigate the associated operational risks during the change process.
- (b) **People:** For a successful transition people are the critical and key resources. A detailed exercise would be required to identify the right resources for the to-be organizations and plan the transition; this will be complemented by training staff on the streamlined processes and the new tools introduced. Keeping everyone informed of changes and next steps is critical to the successful transition to the to-be model.
- (c) **Outreach and communication:** Communication within and outside is very important for the acceptance and success of the initiative. Continuous communication and outreach at different levels is necessary.
- (d) **Governance:** A governance team, preferably constituting members from within and outside the affected organization is critical for the success of the initiative. This team has a very important role of monitoring progress and guiding the implementation team in case of issues arising.
- (e) **Plan big at high level, but detailed for next six months:** Being a multiyear effort it would be difficult to plan all the activities. It is recommended to plan high level milestones for the full initiative with a detailed outlook for next six months. This approach gives sufficient flexibility to change plans without much waste of effort, while still keeping the high level milestones on track.
- (f) **Share success and celebrate:** To keep the momentum on and motivate the people who are a part of the change process, it is necessary to celebrate success with them and getting them recognition.

## IV. Appendix

### Standard Production Process Template

