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Direction and System Changes Impacting on Data Editing and Imputation at Statistics New Zealand

Key Invited Paper

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I.   Introduction

1.   The *Statistics New Zealand Strategic Plan 2010-20* (Statistics New Zealand, 2010a) outlines the high-level direction that Statistics New Zealand (Statistics NZ) will take as it works towards its vision of "an informed society using official statistics". The direction in the plan does require the organisation to change, and in doing so it aims to increase the value of statistical information to New Zealand. There are four strategic priorities (SP1 through SP4) in this plan:
   (a) Lead the New Zealand Official Statistical System so that it effectively meets the country's needs for relevant, trustworthy, accessible information (SP1);
   (b) Obtain more value from official statistics (SP2);
   (c) Transform the way we deliver our statistics (SP3);
   (d) Create a responsive, customer-focused, influential, sustainable organisation (SP4).

2.   There are some changes that Statistics NZ is already committed to, such as its generic Business Process Model, standardised tools and processing platforms, performing less manual data editing, and increased use of administrative data. Other desired changes and the speed at which these can be achieved will be dependent upon investment decisions for the department. Section II of this paper describes the environment and drivers that have led to the organisational direction.

3.   The third Strategic Priority, "transform the way we deliver our statistics", is the most relevant for the data editing and imputation strategies and systems at Statistics NZ. This paper introduces examples of projects in section III that are helping Statistics NZ to achieve desired changes to its systems and direction. In the final sections there is a discussion on the culture change, and a selection of future initiatives relevant to data editing and imputation are presented.

II.   Drivers for change

4.   Social and economic change requires National Statistics Offices to continually work towards producing relevant and timely statistics, using systems that are sustainable for investment reasons, yet flexible enough to be able to adapt to changing needs and uses. While we strive to provide value from our official statistics, the tightened fiscal environment does require us to further minimise costs and maximise efficiency and value.

5.   This is the environment that Statistics NZ was facing when it published its 10-year Strategic Plan and vision in 2010. Changes were already occurring in the organisation in response to these drivers. Existing projects such as creating the *Methodological Standard for Editing and Imputation*, which

contains principles and guidelines, will lead to more consistency and good practice around data editing and imputation strategies. The standardisation of statistical tools has allowed us to research which tools best meet our needs, and to recommend data editing and imputation tools for organisational use, while considering technology and processing system requirements along with methodological needs. The creation of common processing platforms for clusters of social and business collections minimises maintenance costs, and standardises data editing and imputation practice. Investigating ways to better use administrative data can decrease respondent burden and decrease collection costs if used directly, improve quality of statistics if used for validation of data, or provide the opportunity for new statistical outputs.

6.   Many of these existing and desired future projects are linked to SP3. This strategic priority requires Statistics NZ to be a model of sound practice for statistical production, with standard processes and infrastructure across collections. Meeting this strategic priority will enable Statistics NZ to meet user demand, maintain relevance, and be sustainable. These changes will also reduce costs while increasing flexibility and speed of response to changing priorities.

7.   In addition to meeting its own needs, Statistics NZ is the leader of the Official Statistics System (OSS) in New Zealand. The OSS is a collection of government agencies that produce key official statistics. These are performance measures of New Zealand, known as Tier 1 statistics; they need to be produced, analysed, and released to high statistical standards. The *Principles and Protocols for Producers of Tier 1 Statistics* (Official Statistics System, 2007) embodies the key aspects of achieving those high standards. To effectively lead the OSS, as set out in SP1, Statistics NZ needs to apply these principles and protocols to its own outputs and achieve those high standards for its statistics.

III.   Transforming the way we deliver our statistics

A.   Generic Business Process Model

8.   The statistical generic Business Process Model (gBPM) is Statistics NZ's end-to-end statistical business process; it is a guide to achieving standard processes. There are seven processes in the gBPM, as shown in figure 1, and each of these processes has a collection of sub-processes attached. The processes are generic down to the sub-process level for all Statistics NZ statistical collections and outputs. The benefits of standardising the processes and technology include:
   a) Decreasing the differences and separateness between business units and collections;
   b) Staff are able to easily move around the organisation;
   c) Focusing more time on complex and in-depth analytical processes;
   d) Speeding up the development and creation of new statistics.

Figure 1: The statistical generic Business Process Model

9.   The purposes of the seven processes are:
   a) Need – an ongoing process to determine the statistical needs of Statistics NZ's stakeholders;
   b) Develop and design – describe the research, development and design activities to define the statistical outputs, methodologies, collection instruments, sample, operational processes, and end-to-end solution;
   c) Build – produce the components needed for the end-to-end solution and test that the solution works;
   d) Collect – acquire collection data each collection cycle and manage the providers of that data;
   e) Process – clean the detailed data records and prepare them for analysis;
   f) Analyse – statistics are produced, examined in detail, interpreted, understood, and readied for dissemination;
   g) Disseminate – manage the release of the statistical products to the customers.

10.   Many of the projects described in the remainder of this paper will refer to the gBPM or end-to-end statistical business process.

B.   Methodological Standard for Editing and Imputation

11.   Statistics NZ has a strong desire to improve the efficiency of data processing, including data editing and imputation, so that it can put more resources into the data analysis and dissemination phases of the gBPM. In the past, the primary data editing objective was to produce micro level datasets that were as 'clean' as possible. This resulted in data editing and imputation processes where potentially major efficiency gains can be made.

12.   To guide Statistics NZ staff in carrying out data editing and imputation activities for their collections the *Methodological Standard for Editing and Imputation* (Statistics New Zealand, 2010b) has been developed. The standard provides a comprehensive source of objectives, principles, requirements, and guidelines to ensure effective and efficient data editing is applied to Statistics NZ data collections. The standard reinforces SP3, in that it provides a model for sound practice for the data editing and imputation process. Currently, the standard is awaiting endorsement from the internal Standards Governance Board. Approval by the board will encourage adherence to the standard and contribute to the continual improvement of the end-to-end statistical business process.

13.   The objectives for Statistics NZ's approach to data editing are:
   a) Provide users with fit for purpose, plausible data and outputs by the most effective, efficient, and timely means;
   b) Ensure all users are better informed about the quality of our data and statistical outputs;
   c) Continuously improve our end-to-end business processes and overall data quality.

14.   The key data editing and imputation principle is "Statistics NZ should maintain, wherever possible, the original data provided by the respondent or data supplier". This overarching principle is supported by further principles; a selection of these is listed below:
   a) All Statistics NZ outputs must have a documented editing and imputation plan;
   b) Automate the editing process where possible, with the aim of minimising manual intervention;
   c) For each Statistics NZ output: produce, monitor, and analyse editing diagnostics to evaluate and understand the editing process;
   d) For each Statistics NZ output: keep an editing audit trail including unedited and edited data along with data editing flags so that errors can be monitored;
   e) Implement efficient editing techniques, such as macro-editing and selective editing (in data collections where some editing is carried out manually rather than automatically);
   f) Ensure that all Statistics NZ staff working with data collections have access to documentation of, and training in, editing principles, methods, and procedures.

15.   An important aspect of the standard is that it applies to all Statistics NZ data collections including administrative and integrated collections. Principal F is very important in getting staff to support and make changes to their collections data editing and imputation strategies and processes. Staff need to understand the reason for the standard, and how it can help improve the quality of their outputs and introduce efficiencies. It will be the responsibility of the Editing and Imputation Methodology Network (a group of methodologists from Statistical Methods who are responsible for providing strategic direction and capability building to improve data editing and imputation practices across the organisation) to provide this documentation and training, and create and maintain an organisation-wide implementation plan for the standard once approved. The implementation plan will be based on agreements reached between Statistical Methods and the Subject Matter Area.

C.   Development of processing platforms

16.   Statistics NZ identified the need for putting in place infrastructure that will enable the organisation to create its desired environment. The desired environment is an end-to-end statistical business process where production systems and tools are flexible enough to meet changing needs in a responsive way, best practice is encapsulated in any new systems, and where efficient and user-friendly

systems allow more time to be spent by analysts on the Analyse and Disseminate phases. The development of standardised processing platforms are enabling the desired change to occur as well as reducing the number of systems to maintain.

17.   A platform can be thought of as a logical cluster of functionality that can enable components to be 'plugged and played' to provide a complete end-to-end system. There are currently two platforms that have been developed to support unit record processing, the first for the Programme of Official Social Statistics (POSS) which processes cross-sectional social statistics while the other, the Business/Economics Statistics (BESt) platform, was developed for large administrative datasets.

18.   The principles in the development of a platform are to standardise, where possible, the methods and tools, and to be user-driven utilising as much system configuration as possible.

19.   The forerunner to the platforms was the Legolution system, a processing system that delivered generic data editing and imputation for a suite of surveys measuring business performance. This system was developed in 2005 and fitted the business process model in use by the organisation at that time. The project had to be de-scoped during the initial development and was not as generic as first specified. Over recent years it has been further developed and moved to more standardised approaches. Legolution implemented Banff, a data editing and imputation system developed by Statistics Canada, for imputation. Many of the principles which now appear in the *Methodological Standard* were also implemented, for example every output processed in the system had a documented data editing and imputation plan, and flags were used to enable better monitoring of errors.

20.   The original vision for the BESt platform was the development of a SAS-based low-cost option to perform data editing and imputation on two administrative data sources from New Zealand's tax department, Inland Revenue. The two data collections are the IR10 data which consists of a summary of income and expenses (the profit and loss account) and a summary of assets and liabilities (the balance sheet), and the Goods and Services Tax (GST) data. GST is a tax on the consumption of most goods and services in New Zealand. The core of the BESt platform data editing and imputation system is Banff. This platform is currently being developed to support micro-economic survey data as well as administrative data. There will be minimal changes to the data editing and imputation methods used for economic surveys migrating to the BESt platform, as most of the methods used exist in Banff. The main difference would be to automate the data editing and imputation process where possible, with the aim of minimising manual intervention.

21.   The POSS platform started as an interim system for the first General Social Survey in 2008. The POSS platform was re-architected to cater for a future statistical architecture and to resolve a number of issues identified with the interim system. Development of this second generation platform started in 2009 and sits alongside the original platform, reusing many components. Since then a number of social surveys have been included in the second generation POSS platform. Parts of the POSS platform are also used for the longitudinal Survey of Family Income and Employment. The Statistics Canada data editing and imputation system CANCEIS is the standard imputation tool in the POSS platform.

22.   The requirements for the data editing and imputation system in the platforms were:
    a) The system should support continuous improvement, and be flexible and user-configured, user-maintained, and metadata-driven;
    b) Wherever possible, new developments should use a data editing and imputation tool in Statistics NZ's set of standard tools;
    c) The system should produce process flags at each step to indicate which value has been manipulated and by which method;
    d) Automate the data editing and imputation process, where possible, ensuring the best possible use of editing resources, for example, minimising manual intervention (for the BESt platform).
Subject Matter Areas continue to be consulted about their needs and views on what the platforms should deliver for their data collections and outputs.

23.   As we continue to transform the way our statistics are delivered, more platforms based on common infrastructure and survey clusters will be developed. Future work includes integrating the BESt

and POSS platforms with other platforms such as the Collection, Analysis and Dissemination platforms, and the development of processing platforms to support macro-economic surveys (the DNA platform) and the population census. The future state of the end-to-end architecture framework is presented in figure 2, showing the colour coded Collect, Process, Analyse and Disseminate phases of the gBPM. These clusters are all supported by statistical and information technology infrastructures, shown at the top of the diagram.
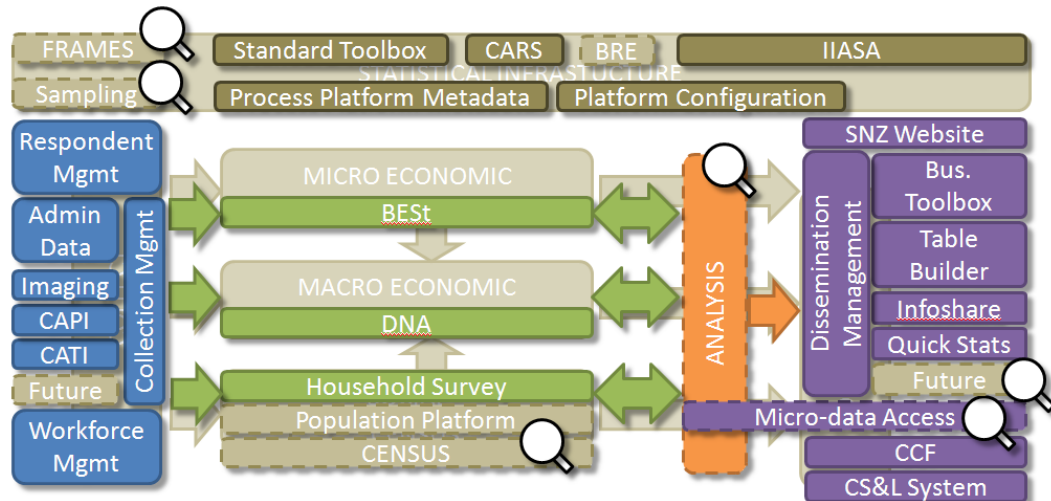

Figure 2: Future state of the end-to-end architecture framework

D.   Overseas Merchandise Trade

24.   The Statistics NZ series Overseas Merchandise Trade (Overseas Trade) is a large administrative data source currently being transferred into the BESt platform. This migration will allow retirement of the legacy system currently used by Overseas Trade. There is work underway to move sub-annual surveyed series into the BESt platform and retire seven further legacy systems. This will help achieve the goal of having sustainable systems and build the functionality within BESt to be used as a processing system for survey data as well as administrative data. With the processing system able to process both types of data this enables future redesigns of collections to align with the gBPM and maximise the use of administrative data.

25.   Overseas Trade data is supplied daily by the NZ Customs Service (Customs) to Statistics NZ. The supplied data is of high quality as Customs performs its own data editing checks and follow-up, however receipt of the corrections is not always in time for the monthly release of trade data. Consequently, Statistics NZ performs data editing of its own on the Overseas Trade data.

26.   With the transition from the legacy processing system to the BESt platform, there was an opportunity to allow several improvements and efficiency gains to be made. These include:
    a)   An increase in automated data editing and decrease in manual data editing;
    b)   Dropping of some edit rules;
    c)   The introduction of quality measures.

27.   Any methodologies required by Overseas Trade that already existed in the BESt platform were to use the existing packages. Methodologies required where this was not the case would have a package built. These new packages can, in turn, be used for subsequent collections.

28.   One example where a package was not already built for a required methodology was selective editing. This was not one of the original requirements for the BESt platform because data editing and imputation for the administrative data collections was fully automated. Overseas Trade uses a selective editing methodology based on a 2005 approach developed by Statistics Sweden (Statistics Sweden, 2005), an in-house module was built and selective editing subsequently implemented into the legacy system in 2008. Although an in-house, purpose-built package is being used for now, the way that the BESt platform is designed means that it is possible to introduce a standard tool for selective editing in

future builds. For example, if the Statistics Sweden selection editing tool SELEKT was endorsed for corporate use through the Standard Methodology Toolbox.

29.   The biggest change in the Overseas Trade data editing process was to increase the amount of automated data editing and decrease the amount of manual data editing. There were a very high number of data edits being carried out by the legacy system, so some rationalisation of edit rules was required. Some of these edit rules were able to be dropped. Additionally, many edit rules being treated manually in the legacy system were identified as able to be treated automatically in the BESt platform. For example, a commodity with an invalid code can be automatically corrected by referencing the Classifications and Related Standards System and retrieving the correct code. Some edit rule failures will not be able to be treated automatically and these will be flagged for manual review.

30.   For the selective editing package for Overseas Trade the resolution for the units that fail selective editing will be automated in the BESt platform, instead of manual as in the legacy system. The unit will also be flagged so the resolution will be able to be reviewed on the manual review screen.

31.   If we push too hard and quickly towards automated edit resolutions there is a risk of introducing bias through over-editing or developing inappropriate resolutions. The strategy for moving to the BESt platform includes the ability to turn off edit automation, allowing the users of the system to gradually increase the use of automation over time and evaluate any changes.

32.   The process of moving Overseas Trade from the legacy system to the BESt platform is a team effort with members of different teams involved in the planning, development, and testing. This has included the Information Technology team building and adapting the BESt platform; the Subject Matter Area providing input for requirements for the system, and building configurations to load data and run edits; and the Statistical Methods team writing technical descriptions, ensuring best practice is met for standards and methods, and evaluating test output.

E.   Standard Methodology Toolbox

33.   In 2010 the first stage of the *Standard Methodology (SM) Toolbox* (Statistics New Zealand, 2010c) project was completed, establishing the toolbox. The toolbox is a definitive and validated list of the methodological tools that Standards and Methods (a division within Statistics NZ) uses in the statistical process, and for which Standards and Methods provide methodological support across the organisation.

34.   Tools in the SM Toolbox are currently used, or have the potential to be used, in more than one data collection, and they are promoted for use and re-use in survey development and redesign. The SM Toolbox is designed to be adjustable (i.e. the tools can be changed and/or updated) as the requirements of our future statistical architecture progresses.

35.   The toolbox includes tools with different status such as legacy, current, and future tools. Any tool listed as 'current' has been fully assessed and found suitable to support the gBPM, and is promoted corporately for use. One issue is that not all the current tools have been assessed with future architecture in mind, so a future assessment of the status of those tools will be required. Some of the documentation available for users of the current tools needs to be improved also. A key criterion for additions to the SM Toolbox will be the ability of a tool to meet the needs of the new production environments.

36.   As part of this change toward standardising statistical methodological tools, Standards and Methods has worked closely with Information Technology (IT) on this project to ensure that the SM Toolbox aligns with the tools, applications, and software that IT maintains on behalf of the organisation. It was important to have IT's support as an understanding of the SM Toolbox will be essential for streamlining the implementation of methodological tools into the new platforms. Standards and Methods has collaborated with IT on a project that looked at how to assess and implement methodological tools; the project has developed an evaluation process documented in the *Guidelines for Implementing Standard Methodological Tools* (Statistics New Zealand, 2010d). It is also vital that statistical output teams are aware of the tools available to them and increase their capacity to use these tools effectively. The

structure of the SM Toolbox as a one-stop-shop including user documentation, training materials, champions, and vendor support information should help users of the tools develop the level of understanding they need.

37.   The data editing and imputation tools that appear in the SM Toolbox as current are Banff and CANCEIS. The introduction of Banff as a tool has enabled greater use of donor imputation in addition to the other common imputation methods and it is being used in the BESt platform to automate end-to-end data editing and imputation. Statistics NZ is investigating how to improve the implementation of CANCEIS in the POSS platform.

38.   Other tools are LogiPlus, SELEKT and SEVANI. However these currently have a status of 'discovery' meaning that they are being researched by Standards and Methods and IT for inclusion in the SM Toolbox and are seen to have the potential for application in the new as well as the current architecture. Increased use of selective editing for economic and financial data is seen as a way to improve the efficiency and effectiveness of the Process and Analyse phases of the gBPM. There is also the potential to standardise the methods and tools required for graphical editing for future inclusion in the SM Toolbox.

F.   Guidelines for implementing standard methodological tools

39.   Statistics NZ is moving to a model where production platforms are constructed using common elements, however each development has the risk of focusing on the immediate needs of the survey and only assessing how a methodological tool meets those specific needs. This approach can result in situations where standard tools are not used, or where they are configured in non-standard ways.

40.   There was a need to have a clear path when implementing standard tools that will provide long-term organisation-wide benefits in terms of costs, reliability, functionality, and continuous improvements. The *Guidelines for Implementing Standard Methodological Tools* have been developed to help change the way methodological tools are assessed and implemented. It aims to have Standards and Methods and IT working together to ensure that technological compatibility and methodological utility are considered together and early on in any evaluation process. Another issue the guidelines will address is moving to the next version of a tool, by having an implementation plan that will ensure that all users migrate to the new version.

41.   The old process allowed individual business areas to have their own process for purchasing methodological tools. The risks in this approach include no clear direction on who to contact in IT for support, changes in IT infrastructure affecting the use of a tool for a particular business area, different versions of tools in use by different teams, a free version of a tool may not have all the functionality required so additional costs could be encountered for software upgrades, implementation plans not in place, no owner identified for a tool, and organisational needs not considered. The IT teams Enterprise Architecture and IT Vendor and Procurement Management were not often involved early enough in the evaluation process.

42.   The new process consists of evaluation, procurement, and implementation phases that involve Standards and Methods, IT Vendor and Procurement Management, Enterprise Architecture, and IT Solutions teams. For the evaluation phase Standards and Methods (or the business unit proposing the tool) evaluates the functionality and considers alignment with the strategic direction. The IT Vendor and Procurement Management team provide recommendations and advice regarding the impact of the new tool on the existing environment, risk assessments, and contract agreements. IT Solutions reviews the tool on the basis of compatibility, application type, and software life expectancy. An architecture review is also carried out to analyse the overall design of the solution and recommend how to proceed in a way that is consistent with the Statistics NZ Enterprise Architecture standards.

43.   To assess the effectiveness of this new process for implementing standard methodological tools, SELEKT and SEVANI were assessed using the evaluation phase from the guidelines. The outcome of this was a recommendation from Standards and Methods that SELEKT and SEVANI should be considered as a standard data editing and imputation tool; confirmation from the Enterprise Architecture

and IT Solutions teams that no issues were found with either of the tools for how they would fit into the Statistics NZ architecture and IT environment; and endorsement of the evaluation phase of the guidelines with some minor improvements suggested. The owner of the SM Toolbox is yet to endorse the change of status for SELEKT and SEVANI from discovery to current.

G.   Standard process quality measures

44.   Another joint project by Statistical Methods and IT Solutions is creating "Standard Process Quality Measures for Business Surveys". The objective is to implement a standard set of process quality measures for business surveys covering the gBPM via Analysis Cubes (in Excel). If the implementation of the quality measures in an Analysis Cube is successful then there is the potential to implement this in the BESt platform during later development.

45.   A framework of quality indicators for data editing and imputation processes in the Statistics NZ environment was developed in 2009/10 (Statistics New Zealand, 2010e). The framework supports the realisation of objectives one to three of the *Methodological Standard for Editing and Imputation* as well as the interpretability protocol in the OSS *Principles and Protocols for Producers of Tier 1 Statistics*. This protocol states that "Processes and methods used to produce official statistics, including measures of quality, are fully documented and are available for users to understand the data and judge the quality of fit". The framework was found to have the ability to improve the efficiency of the data editing process and to provide analysts relevant information for quality monitoring, although some challenges were faced with the case study. It depends on the ability of the data editing and imputation system to record and store necessary data to support easy computation of the indicators; the *Methodological Standard* supports this need. The framework is a starting point for this project.

46.   Also feeding into this project is a review of 'quality gates', a concept from the Australian Bureau of Statistics (Australian Bureau of Statistics, 2006) that imposes quality checkpoints at predetermined points in the end-to-end statistical business process. Applying these to the gBPM will enable quality controls at sub-processes that are considered critical points, thus ensuring the overall quality of the process. At each quality gate a decision is made to fail or pass the gate and proceed to the next set of sub-processes. Quality gates have already been implemented for some production cycles, including the quarterly and annual Linked Employer-Employee Data outputs.

47.   The ability for Subject Matter Areas to interpret quality measures and provide quality gates information via Analysis Cubes would be an exciting improvement to the way the organisation currently monitors quality and it would improve the end-to-end statistical business process by ensuring quality standards were met all the way through the statistical process.

H.   Administrative and integrated data

48.   As part of SP3, it is recognised that there are opportunities to maximise the use of existing administrative data. Statistics NZ aims to achieve an environment where administrative data is the first source of data, supplemented by direct collection where necessary. Some progress towards this aim has been made as the BESt platform was first developed to process administrative data from the taxation system. The paper "*Automated editing and imputation system for administrative financial data in New Zealand*" (Statistics New Zealand, 2009) explains how IR10 data has been introduced for direct replacement for simple, small businesses in Statistics NZ's main business financial collection, the Annual Enterprise Survey, and outlines the data editing and imputation processes implemented for this administrative data source. Before the processing of IR10 data moved to the BESt platform, the data editing and imputation approach was mainly manual and some units had all their data set to missing and later imputed even if only one value had initially been suspicious. This approach did not make the best use of the data available, so part of the motivation for moving data editing and imputation processing to the BESt system was to make improvements to this approach including a fully automated data editing and imputation process and availability of quality measures.

49.   There have been several data integration projects at Statistics NZ, including the Linked Employer-Employee Data (LEED) project. LEED uses existing administrative data drawn from the

taxation system, together with business data from Statistics NZ's Business Frame to create a linked longitudinal dataset that can be used to measure labour market dynamics. Although LEED is now used to produce official statistics, work continues to see how LEED can be used to improve existing statistics and met our user's needs. LEED could provide options for improving data editing and imputation strategies by using it for validation of certain variables or outputs – a potential change for the future.

IV.   Discussion on culture change

50.   How to engage staff at Statistics NZ to be part of a culture of change starts with the Statistics 2020 project. This project is the programme of work that guides the organisation in what it does over the next 10 years to ensure it achieves the goals set out in the Strategic Plan. Statistics 2020 has a homepage staff can access to keep informed, there have been presentations to business areas outlining the project and their involvement in it, and engagement days between staff and the Statistics NZ board including time to discuss Statistics 2020. Most staff will have had the opportunity to learn about the project, have an understanding of where the organisation is trying to head, and know about key milestones along the way.

51.   A range of projects have been described in this paper that have an impact on Statistics NZ data editing and imputation strategies and systems. The common theme, whether creating standards, assessing methodological tools, or building and migrating to new processing platforms, has been the team aspect of these projects. Many people in different areas are affected by these changes, so it has been important to involve representatives from the different areas in planning, testing, consulting, and endorsing the changes.

52.   In summary, the culture change required at Statistics NZ incorporates the following:
   a) Aligning all data collections and outputs with the gBPM, the guide to achieving standard processes;
   a) Implementation of the *Methodological Standard* for all data collections, including having a data editing and imputation plan in place for all outputs, to ensure greater consistency in methods and good practice amongst outputs;
   b) An understanding from Subject Matter Areas that the current level of manual intervention in the data editing and imputation process is inefficient, and that some automation in the process can still result in fit for purpose outputs and deliver efficiencies;
   c) Maximise the use of common methods and infrastructure to minimise maintenance costs and allow more time to be spent by analysts on analysis and dissemination of outputs;
   d) Gain more use from available data, including administrative data sources.

V.   Future initiatives

53.   To progress towards the goals set out in the Strategic Plan, Statistics NZ has prepared a business case that outlines the details of how the organisation plans to meet these goals. Although the level of investment has not yet been decided by the government, there are some future initiatives that are particularly relevant to data editing and imputation. These desired future initiatives include:
   a) Migrate more social surveys to the POSS platform;
   b) Migrate more micro-economic data sources to the BESt platform and develop macro editing functions for the platform;
   c) Implement and manage a quality framework;
   d) Establish and implement a statistical maintenance programme;
   e) Enhance the Statistical Methodological Toolbox;
   f) Research expanded use of administrative data sources and provide long term direction;
   g) Development to gain further use from the LEED dataset.

54.   A number of the projects presented in this paper are in the early stages of implementation. It is important that these projects are implemented effectively to maximise the benefits Statistics NZ will get from them, along with advancing the desired future initiatives.

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