

## **1) INNOVATION SUMMARY**

### **1.1 Tile of Innovation: Ajman Self Enumeration & Integrated Administrative Data Census Project**

### **1.2 Year Innovation was put into practice: 2020**

### **1.3 Short and Simple Explanation**

Launched in 2020, the Emirate of Ajman has created a central registry to capture vital statistical data on covering its population and households. At the core of this initiative, the Ajman Statistics Center developed an innovative platform (AJC Portal 2020) that enables the self-enumeration of certain data fields by residents of Ajman, covering specific variables related to their demographic, socio-economic and living accommodation details.

The platform is a sophisticated web enabled self-managed system that allows a designated user (administrator) per household, to populate and maintain all the relevant details for each member of his/her family. The data captured via the system enables the accurate and real time estimation of key census-level statistical indicators required to “fuel” evidence-driven policy decision making by various Government entities

Additionally, the system has ‘backend interface’ linkages with administrative data maintained by 13 Government entities, including Ajman Police and Department of Land & Real Estate Regulation. The system has in-built monitoring capabilities to capture data gaps (based on ‘missing records’) as well as data discrepancies (based on system-enabled ‘cross-tabulations’ with external administrative data captured). Through automated email notification and dashboard reporting functionalities, the system generates alerts on specific data records, enabling the Office to design targeted data augmentation efforts.

The AJC Portal 2020 is a one-of-its kind project in the domain of statistical data collection and reporting, as it combines the simplicity of a UX-friendly interface for self-enumeration with the sophistication of backend interlinkages with administrative data registries, to produce vital economic data on a real time basis. Since its launch, the project has greatly benefited various Government entities in Ajman towards gaining access to vital socio-economic data refreshed on a real time basis, thus enabling targeted public policy design and decision making.

### **1.4 Innovation Overview**

The genesis of the project is linked to the ‘UAE Administrative Census 2020 Project’, which was initially announced in July 2019. The project spearheaded by the UAE’s Federal Competitiveness and Statistics Authority (FCSA), brought together all the Emirate specific statistics centers (including the Ajman Statistics Office) and other Government entities across the UAE. The objective of the project was to foster collaborative efforts in developing a solution for leveraging key administrative data captured by relevant Government agencies, as a ‘feed’ for unified census reporting. This was towards enabling higher cost and time efficiencies in census data generation, based on the directional recommendations issued by the United Nations towards exploring synergies provided by administrative data collected by nations.

Based on its own assessment of the administrative data frameworks maintained by the local Ajman authorities, as well as learnings from international best practices followed by statistics authorities in developed countries, the Ajman Statistics Office noted that inter-operability of these administrative data mechanisms was not possible without overlaying a ‘self-enumeration’ mechanism, where the onus of populating certain details related to family member demographics and residential accommodation characteristics, would have to vest with the residents of Ajman.

While the system design efforts were initiated in early 2019, the prototype was piloted in the Manama and Masfout areas in Ajman, before the Emirate – wide full project rollout in the latter half of 2020. A core part of the design phase was the integration of external administrative data within the Portal and assessing relevant inter-linkages with the self-enumerated data component.

As part of this process, an assessment framework ('Statistical Maturity Index') was designed to ascertain the quality and format of data maintained by the designated external entities – effectively, enhancing data quality to attain a certain threshold value was set as a pre-requisite for initiating entity specific data integration efforts.

The guiding rationale underpinning the development of the AJC Portal 2020 was therefore to complement the UAE wide administrative data unification efforts to generate accurate 'population-level' census details, that are a critical feed to the Government's planning efforts underpinning economic forecasts, socioeconomic assessments, and fiscal budgeting.

To this effect, the project is geared towards empowering robust policy design, decision making and implementation across various dimensions of socio-economic development, including – workforce, education, health, housing, urban planning, and social services. Ultimately, these targeted development efforts are geared towards enhancing economic prosperity and improving the 'quality of life' for the citizens and residents of Ajman.

Notably, various initiatives undertaken in Ajman post 2020, including the Ajman Attractiveness Survey (another flagship project of the Ajman Statistics center), have significantly benefited from real time data made available via the AJC portal 2020 project – this is a significant deviation from the erstwhile dependence on the 2017 Ajman census data which arguably did not provide an accurate baseline, particularly given the external environmental changes that have occurred in the last three years.

At the core, the portal is fueled by a self - enumeration mechanism – this entails a designated member of every family (administrator) creating a 'family file' with a unique identifier number, incorporating various details related to the accommodation (e.g., building type, covered area, number of bedrooms) and the family member demographics (e.g., age, gender, education levels, employment status). Additionally, the self-management mechanism allows family administrators to make relevant updates and modifications related to changes in family status (births, deaths) and accommodation (moving in, moving out). Effectively, this system eliminates impact on data validity due to population shifts and workforce mobility, by transferring the onus of 'status updates' on residents themselves.

The system also enables quality assurance through in-built capabilities for capturing data discrepancies and inconsistencies. For instance, a conflict between tenancy registration records (from the Department of Land & Real Estate Regulation) and the household count data in a certain area (hosted by the portal) will trigger relevant alerts for verification.

Additionally, the system also incorporates appropriate protocols and monitoring dashboards to gauge levels of data 'completes' and automated alerts to signal specific fields that do not meet acceptable thresholds. Effectively, this enables the Ajman Statistics Office to carry out targeted data enhancement and validation efforts, via a combination of call center outreach campaigns, field visits, and mall intercepts.

The portal also includes system administrator capabilities for record management including eliminating file duplications, disabling user modifications on completed files and generating system reports.

Effectively, based on the combination of its conceptual framework, system architecture and quality management functionalities, the Portal has become a vital tool for decision makers to tap into demographic and geographical composition changes on a real time basis. It enables accurate research planning framework design, which is a critical component of effective policy design, decision making, implementation and evaluation.

As part of its wider impact, the project contributes to transforming traditional approaches in the execution of economic census and surveys, by enabling significant cost and time efficiencies associated with the combination of self-enumeration and the integrated access to administrative records hosted by various Government entities.

## 1.5 Innovation Tags

#Citizen Engagement, #Communication, #Data, #Design, #Digital and Technology Transformation, #Futures and Foresight, #Methods and Tools, #Open Data, #Open Government, #Leadership, #Process Improvement/Simplification, #Public Consultation, #Public Policy, #Strategic Design, #Transparency, #UX/UI Design

## 2) INNOVATION DESCRIPTION

### 2.1 What makes your project innovative

The novelty of the AJC Portal 2020 is prevalent in the combination of:

- *The conceptual framework underpinning the project*, which is premised on a system enabled self-enumeration mechanism integrated and interlinked with key administrative registries maintained by 13 Ajman Government entities, including - Ajman Police, Ajman Municipality and Department of Land and Real Estate Regulation. Notably, this addresses the issue of the lack of the 'inter-operability' between the entity-specific administrative data and statistical calculation frameworks used for statistical indicator estimations.
- *The quality management functionalities of the system*, entailing in-built protocols for determining 'data completeness' (based on captured records) and 'data accuracy' (based on cross-tabulated verifications with administrative data), complemented with auto generated alerts to signal target areas for intervention, via data augmentation efforts.
- *The self-management/administration capabilities of the system*, that enable users (family administrators) to update, delete and modify data records related to family members and residential accommodations to reflect specific status changes.

It is the combination of these core elements underpinning the project that:

- Enable the availability of 'error-free' data and census level reports on a real time basis
- Enable effective sample allocation and research framework design, required for accurate data analysis and evaluation, aligned to public policy decision, evaluation and decision making.
- Enhance the credibility and quality of research, studies and economic reports undertaken by the Government.
- Enable superior cost and time efficiencies, vis-à-vis traditional methods of census-level data collection.

The AJC Portal 2020 has already enabled the data feed for other key initiatives, including the Ajman Attractiveness Survey which is a flagship initiative of the Ajman Statistics Center. This has 'test bedded' the success of the project, thus setting it up for potential widespread adoption by the other Emirate – specific Statistics Centers as well as the Federal Statistics and Competitiveness Authority. Ultimately, this would maximize the outcome of the administrative data unification census project at a national level and enable the UAE to meet the United Nation's recommended directive.

### 2.2 Innovation Status

The project is current at the stage of "Evaluation", wherein the post implementation impact and benefits are being systematically assessed. This is an iterative process and entails identifying potential for enhancing the functionality of the Portal.

Some notable enhancements include:

- Established rules for frequency of data exchange covering designated data points across 13 external entities contributing administrative data into the AJC Portal 2020
- Enhanced integration outcomes due to enhancement in the quality of administrative data hosted by external entities based on targeted improvements guided by the Statistical Maturing Index.

As part of its future roadmap, the platform will embed superior Business Intelligence (BI) and Analytics capabilities governing the linkages between the administrative data and the self-enumerated data components, geared towards enhancing the Portal's auto functionalities for quality management.

Overall, the progress achieved in the implementation of the project is a significant leap towards the UAE's national administrative data unification effort, enabling the 'UAE Census 2020 initiative'.

### **3) INNOVATION DEVELOPMENT**

#### **3.1 Collaborations & Partnerships**

Aligned to its core philosophy of keeping the community at the center, the conceptualization of the model engaged citizens, residents, and civic interest societies during the design stage. Focus group discussions were conducted with over 100 participants constituting the demographic, psychographic and geographical profile of the Emirate of Ajman. Academicians and subject matter experts were also consulted to conduct reliability and validity tests on the initial prototypes.

As part of the survey execution cycle each year, the Ajman community is engaged for inputs on - framework architecture enhancements, clarity of measurement variables, interpretation, and validation of results. Additionally, there are also partnerships in place with technology service providers for instituting improvements in the functionality and UX interface of the survey platform.

#### **3.2 Users, Stakeholders & Beneficiaries**

At the outset the project enables the Ajman Statistics Center, to generate accurate census – level statistical data on a real time basis, thus empowering various public service and regulatory agencies in Ajman to become more agile and effective in their policy design, planning, and implementation efforts.

This is a key 'feed' for driving superior public policy outcome; ultimately, delivering a higher socio-economic impact for the beneficiaries of these policies.

The design and conceptualization of the project drew the contribution of statisticians and academicians with expertise in census framework design and indicator measurement methodologies. These experts were instrumental in ensuring effective linkages between self-enumerated and external administrative data flowing into the Portal, as well as in validating the accuracy of outputs. These inputs served as the 'backbone' of the programming architecture of the AJC Portal 2020.

### **4) INNOVATION REFLECTIONS**

#### **4.1 Results, Outcomes & Impact**

The self-enumeration project 'powered' by the AJC Portal 2020 has been successful in meeting the objectives that it was conceptualized for. As a key outcome, the system has enabled the generation of accurate, census-level socio-economic data on a real time basis, which is vital 'feed' to the public policy planning and design efforts of various Government entities in Ajman.

As a testament to this, the 2021 and 2022 cycles of the Ajman Statistics Center's own flagship project, the 'Ajman Attractiveness Index' has received a significant component of its aggregate input data feed from the self-enumeration project.

Notably, the availability of this vital refreshed data through the project has enabled more accurate statistical 'fine-tuning' for forecasting purposes, which is a significant positive deviation from the use of the 2017 census baseline data in policy planning cycles undertaken prior to the launch of the self-enumeration project. The availability of periodic data readings within short- intervals enables agile planning and prioritization, ensuring a highly enhanced level of responsiveness to the community's needs.

Additionally, the project has shown how significant efficiencies in cost, effort, and time can be delivered based on the innovative conceptual framework that it is premised on. This signals an exponential transformation from a traditional census approach that relies on substantial deployment of field resources. Table 1 below presents a cross comparison between specific cost and time estimates between a traditional census approach vis-à-vis the Self-enumeration & Administrative Data Based Census Model.

**Table 1: Comparison between Traditional Census and Self-enumeration & Administrative Data Based Census Model**

Traditional census	Self-enumeration & Administrative Data Based Census
<b>Administration</b>	
<ul style="list-style-type: none"> <li>The census is based on field visits to families and personal interviews.</li> <li>Need to have large number of field personnel</li> <li>Extensive project management efforts to recruit, train, follow up and supervise field officers</li> </ul>	<ul style="list-style-type: none"> <li>Rely on available administrative records.</li> <li>Use the method of self-counting or electronic self-update.</li> <li>Human resource requirements are much lower than traditional census models</li> </ul>
<b>Data Availability, Accuracy and Security</b>	
<ul style="list-style-type: none"> <li>Delays in extracting the initial results.</li> <li>Delay in the publication of detailed final data.</li> <li>Potential for error in requested legal and evidentiary documents.</li> <li>Potential operational inefficiencies and data security compromise associated with heavy reliance on human personnel for data sharing and handling</li> </ul>	<ul style="list-style-type: none"> <li>Real time refreshed census data.</li> <li>System generated documents.</li> <li>Leverage existing infrastructure and systems available in government agencies, sharing administrative data.</li> <li>Efficiencies associated with digital transformation and benefit from modern technologies.</li> <li>In-built data security and encryption protocols</li> </ul>
<b>Time Efficiency</b>	
<ul style="list-style-type: none"> <li>Lag of 3 years to prepare and execute the census.</li> <li>Delay in extracting and disseminating results</li> </ul>	<ul style="list-style-type: none"> <li>Real time and refreshed census data</li> <li>High replicability of the system – takes around 6 months to build</li> </ul>
<b>Financial Consideration</b>	
<ul style="list-style-type: none"> <li>Huge budget considerations, attributable to: <ul style="list-style-type: none"> <li>Preparing technical and electronic programs and purchasing devices for data entry.</li> <li>Financial outlay for field researchers, supervisors, and observers for (500 individuals).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Significant cost efficiencies <ul style="list-style-type: none"> <li>Low capital and operating budget outlay - self-counting platform is estimated at a cost of 4.5% of the costs of software and technical hardware for the traditional census.</li> <li>Operating costs related to salaries and incentives is much smaller, given the low personnel count involved It does not need a huge financial cost for census</li> </ul> </li> <li>The cost of one completed record 97% lower compared to the cost of the form in the traditional census.</li> </ul>
<b>Other Consideration</b>	
<p><b>Other dimensions</b></p> <ul style="list-style-type: none"> <li>Demographic and count data on individuals and residents, is generated every ten years.</li> <li>No link to the administrative records of government departments with the databases of the Statistics Center.</li> </ul>	<p><b>Other dimensions</b></p> <ul style="list-style-type: none"> <li>Real time census data generation</li> <li>Onus of populating and updating data on residents, with flexibility of self-management systems</li> <li>Self-enumeration removes the need for time spent on survey participation</li> <li>Linking administrative records of government departments with the databases of the Statistics Center.</li> <li>Launch of Statistical Maturity Index to ensure the accuracy and quality of administrative records data and their alignment with the approved international standards (<i>The Statistical Maturity Index of Data Quality in Official Records at the Emirate Level has achieved an 80% score</i>).</li> </ul>

As an 'induced' benefit, the project has created a dynamic platform for input gathering from the community. As the AJC portal 2020 hosts real time population-level aggregate counts on households, families, and residential buildings as well as rich demographic data; it provides a ready platform for Government decision makers to size, analyze, and validate potential considerations for new programs, policies, and investment specific to the agendas they are working on at any given point in time.

Potentially, census level data captured by the platform can be used to 'fuel' any decision variable that requires population-based estimation. This eliminates the redundancy in designing and administering thematic research instruments, that would have to capture population and demographic data separately and repetitively. For instance, if the Telecommunication Authority wishes to derive an accurate estimate of internet penetration in the Emirate, data gathering efforts become optimized to a minimal set of data points to be captured.

#### **4.2 Challenges & Failures**

A key challenge during the conceptualization stage was the prevalence of inconsistencies between the data frameworks captured by various external administrative agencies, vis-a-vis statistical reporting standards. To resolve this, the AJSC developed the 'Statistical Maturity Index', which was effectively used to guide data quality standards at the source entity, as a pre-requisite to integration within the AJC Portal.

Secondly, it was critical to ensure that the system delivered on a spectrum of multi-faceted user objectives, i.e., serve as a reliable, robust, and self-managed tool, enabling intelligent analysis on a real time basis. There was a huge pressure for the system design phase to be highly 'agile', to ensure that the 'programming backbone' enabled accurate and complex data analysis in line with statistical frameworks. The latest version of the system incorporates intelligent logic-based simulation functionalities, and key features for quality assurance and project management.

#### **4.3 Conditions for Success**

The Project drew on a host of factors underpinning its success, including:

- A 'whole of Government' approach premised on collaboration amongst multiple agencies committing to share administrative data, in line with the census-reporting requirements
- Pooling subject matter expertise across various domains including - national statistics, technology, quality management and excellence
- Securing the community's commitment to provide and continually update required 'self-enumeration' details on the Portal - this was done through a combination of incentives, 'nudges' and public engagement
- Leadership, guidance, and governance from the highest Government levels (Ruler's Office), via specialized task force structure
- 'Design thinking' approach for Portal development, aligned to multi-faceted objectives, including - simplified UX journey for self-enumeration, coupled with robust functionality for system administration intelligence enabled real-time data analysis and quality management

#### **4.4 Replication**

The self-enumeration project 'powered' by the AJC Portal serves as a 'best practice' for other local statistics offices in the Emirate to replicate. This replicability is in effect, a vital condition to meet the objectives of the UAE Administrative Census project, which requires an Emirates-wide system for census reporting based on a nation-wide unification of administration records.

Ajman has pioneered a fully stable, robust, and efficient system based on a novel conceptual framework, premised on integrating specific data fields 'self-enumerated' by the community, with administrative data from multiple public entities, to produce credible census -level statistical reports.

Beyond the UAE, the project has potential for global adoption and in substantially transforming data collection and research framework design practices associated with traditional census models. Robust system design, public commitment, and Government collaboration are key considerations for potential adoption.

#### **4.5 Lessons Learned**

The project provided immense insight into data integration considerations, when dealing with complex statistical indicators. As a pre-requisite to projects of this nature and scale, it is imperative to establish protocols for data standardization.

Every data point in national statistics has its own unique characteristics - we needed to ensure that the software program backbone for analysis, reporting and quality management was guided by statistical definitions, rules and constructs.

Quality data contributed by the public was a critical success factor for this project. We found it easier to get buy in when we started engaging the community on the potential policy outcomes and benefits that we could achieve through their participation.

A collaborative model that drew public agencies, subject matter experts and the community, underpinned a 'holistic' system, that not only meets its design objectives, but also delivers multifaceted envisaged and unanticipated benefits for stakeholders.

#### **4.6 Anything Else**

The Project has been a resounding success, and AJSC is the only government entity in the country that has implemented the Census powered by the Platform. AJSC is committed to sharing these experiences locally, regionally, and globally in an endeavor to disseminate 'best practices' aligned to statistical data collection and agile data based agile public policy planning.

To this effect, the AJSC has:

- Conducted workshops with all the local statistics offices in each Emirate - Dubai, Abu Dhabi, Ras Al Khaimah, Fujairah, and Umm Al Quwain
- Presented a paper on key learnings to the Gulf Statistics Centers at the Gulf Co-operation Council level
- Presented a conceptual paper at a regional conference on population census, organized by the United Nation's Economic and Social Commission for West Asia (ESWA) Commission