INSTITUTO NACIONAL DE ESTATÍSTICA
STATISTICS PORTUGAL

FIFTH INTERNATIONAL WORKSHOP ON BUSINESS DATA COLLECTION METHODOLOGY

19–21 SEPTEMBER 2018 – STATISTICS PORTUGAL, LISBON

Use of computing mobile devices in the Economic Censuses for updating the Mexican Statistical Business Register and georeferencing establishments

INEGI, Mexico
20 september 2018

Economic Censuses: the most complete and detailed source of basic economic information of Mexico

Censos económicos

It contains, in high detail, the characteristics of the national economy

Data on all the economic activities, at any level of geographical detail

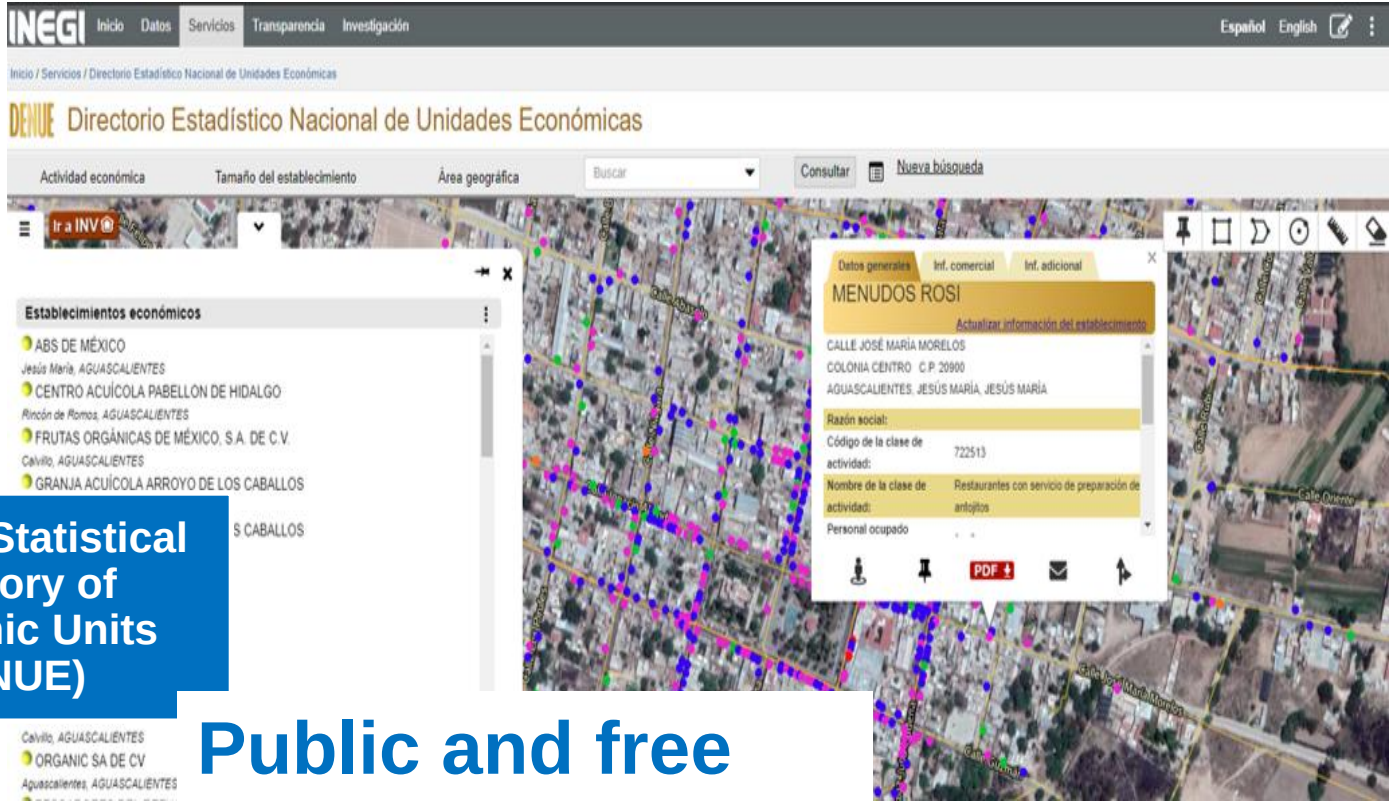
It is used in several public, private, academic and social projects

DENUE, a product of the Economic Censuses

Economic Censuses every 5 years

Updating the whole SBR every 5 years

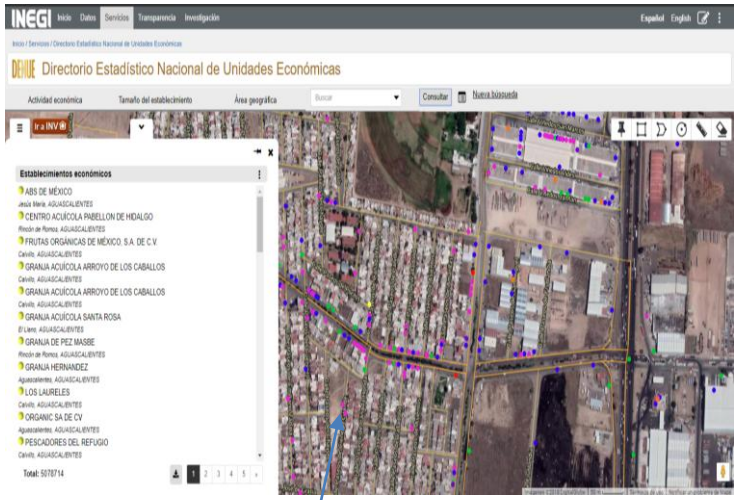
National Statistical Directory of Economic Units (DENUE)



Public and free

The DENUE is a highly demanded product due to its characteristics :

All businesses of the country are located there, assembled in a GIS



Every establishment appears represented in the digitized cartography, at the exact corresponding place, **identified by means of a dot**

Businesses are classified according to **economic activity** based on an international classification system (NAICS)

It contains **business data on identification, location and size**, of every single business of the country

COMEX INDUSTRIAL COATINGS SA DE CV

Actualizar información del establecimiento

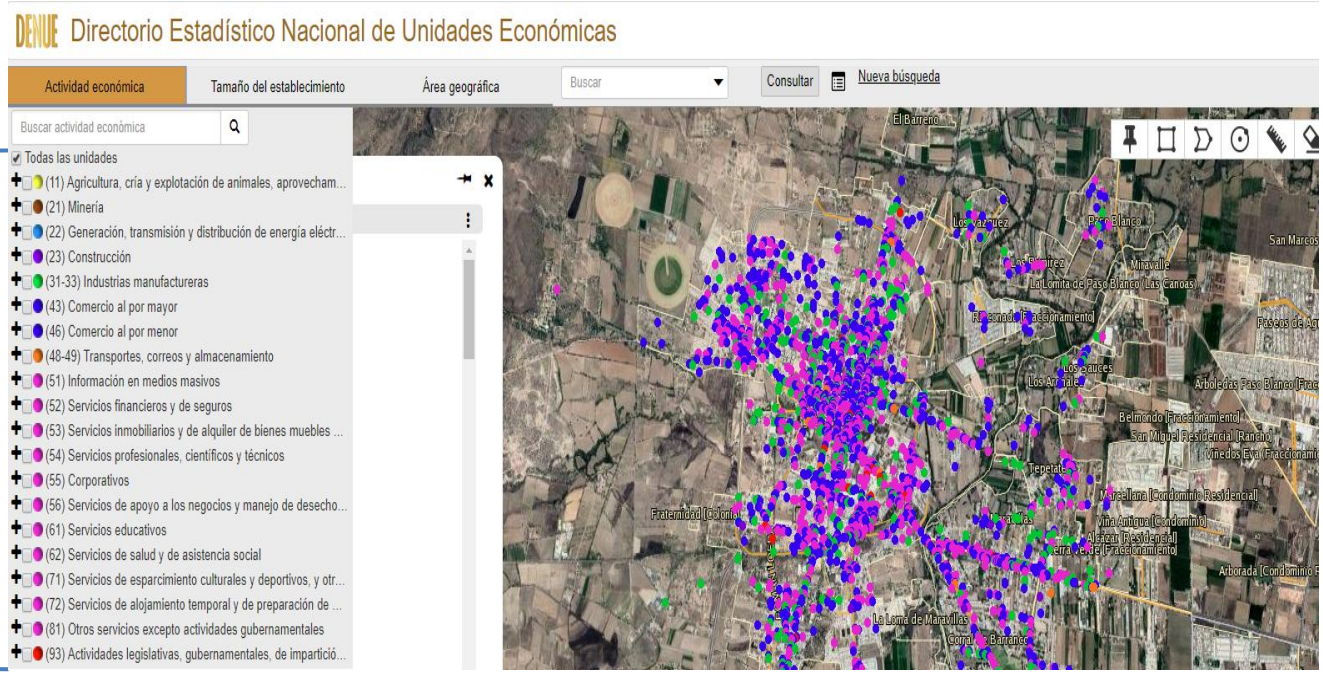
VÍA GUSTAVO BAZ #3999
SAN ANDRÉS ATENCO C.P. 54030
MÉXICO , TLALNEPANTLA DE BAZ, TLALNEPANTLA

Actividad económica:	Fabricación de pinturas y recubrimientos
Personal ocupado:	101 a 250 personas
Teléfono:	
Correo electrónico:	
Sitio en internet:	
Tipo de unidad económica:	Fijo
Fecha de incorporación al denue:	JULIO 2010

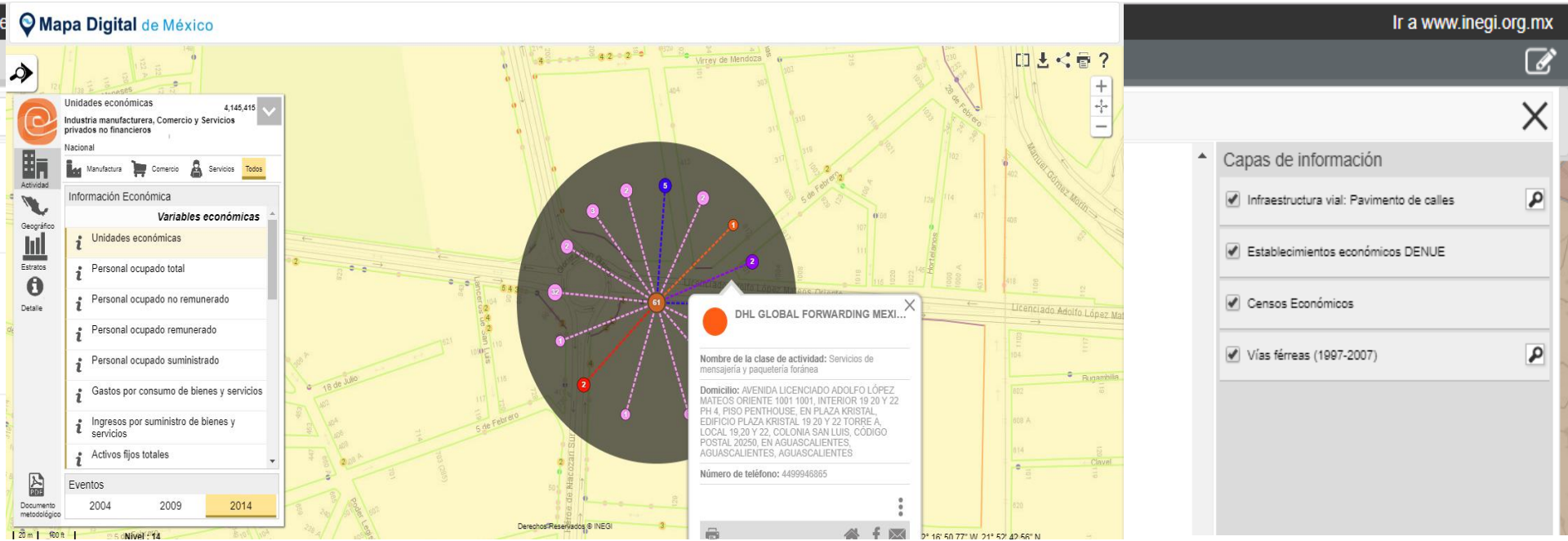
Inf. comercial | Inf. adicional | PDF

More than 60 thousand searches per month

With all these characteristics, **the user can search exactly the universe of his or her interest**, by choosing the specific activities he or she wants to search

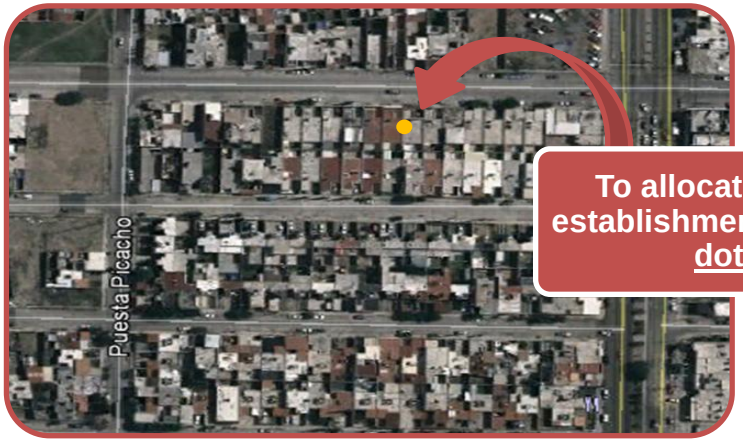


The DENUE is in a GIS, developed by INEGI, where the user can visualize more than 240 layers of information:



In this example, the chosen layers are: the DENUE, Economic Censuses, railways, and paved streets

But first of all, it is necessary…

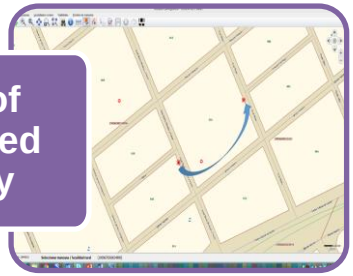


To allocate each establishment with its dot

By means of two esencial elements:

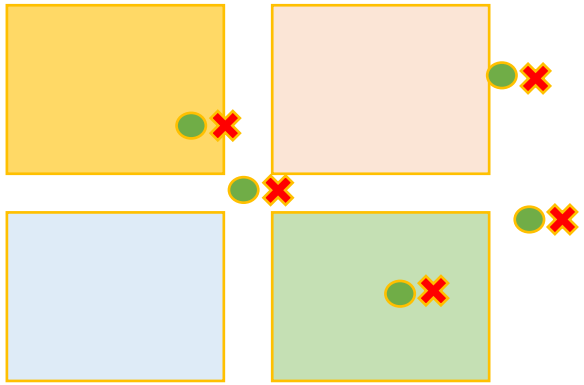
A Computing Mobile Device (DCM, its acronym in Spanish)

and inside of it...the digitized cartography

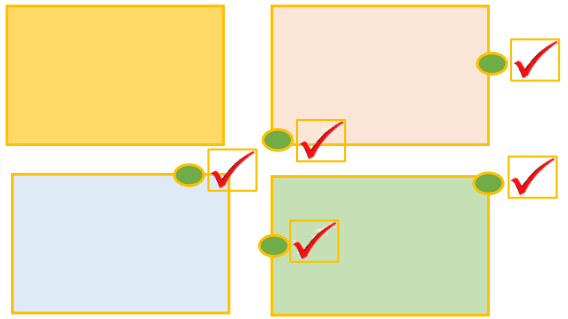


Why not allocating the dot with a GPS?

- The error with GPS could get as far as 30 meters, therefore the dot could be located even in a different block



- With digitized cartography in DCM, and satellite images, the interviewer established himself in the right location and more easily, and allocated the dot in the correct place, at least in the correct block and front of block



DCM for capturing census data: first steps

A PDA was used for CE2004

First “experiment”, Economic Censuses 2004

10% of geographical areas in EC2004 were covered with a DCM

Limited capacity, but it allowed to capture street names and, during the interview, to allocate them automatically

The objective of the experiment was achieved: to prove that the use of the DCM was feasible and convenient for census data collection

In CE2009, the DCM was used for the whole census data collection

Before 2014, INEGI concluded the digitalization of the cartography, including street names, and it was incorporated into the DCM

Both blocks and streets keys were automatically allocated into the questionnaires

The interviewer could locate the exact location of each establishment and to assign it in the digitized cartography, as a dot

In EC2014 a more advanced DCM was used

With the development of technology, the DCM acquired for EC2014 was substantially better. The conditions searched for were:

- A bigger screen that enabled the inclusion and visualization of long texts
- Higher capacity of memory and processing
- **That the DCM were still light, but with "heavy duty" characteristics**

Tools added to DCM, for EC2014:

- Systems: cartographic module, operational routine, questionnaire's validation, automatic classification and data safety protocol
- Digitized cartography
- Satellite images
- Workload
- Catalogues and operative manuals
- Registration of progress per blocks and establishments
- Questionnaire and validation system
- Directory of economic units
- Portable keyboard, help with concepts, calculator, warning messages

By using these tools, INEGI obtained:

- ✓ Lesser time of interview and less re-enquiries
- ✓ Full updating of DENUE
- ✓ Exact location of each establishment in the geographical space
- ✓ Higher speed, agility, efficiency and quality in data processing and transmission, when compared to a PDA
- ✓ Longitudinal follow up of each DENUE's establishment

This way, in EC2014, more than 5 million establishments in the country were georeferenced, as well as 26 million of dwellings, and all the empty properties

From paper to DCM…

Defining highly in advance the census questionnaire, validation criteria, operative strategy and detailed planning

Establishing, beforehand, the logistics for data collection, supervisions, and training strategies

Preparing all capturing and follow up systems, also ahead of time

Savings in Census data collection through DCM

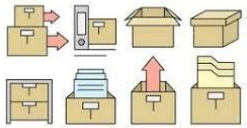
- Paper (and trees), printing of questionnaires and transport

- Wages of data “validators”

- Wages of data transcribers

- Wages of supervisors of capturing

- Leasing spaces and buying computers



- Storage of questionnaires

- Reduction in the number of re-visits to the respondent

- **Using DCM represents saving of 20% in relation to previous data collection conducted in paper**

Other benefits of using the DCM

- ✓ Homogeneity during the development of the interview
- ✓ Faster and more accurate data collection and data updating
- ✓ More timely data release
- ✓ Immediate data transmission
- ✓ Easier control and follow up of the census data collection activities
- ✓ Easier staff training

Conclusions

Using Computing Mobile Devices has enabled:

- Saving resources
- Improving data quality
- More control during data collection
- More control in data revision
- Improving training processes for interviewers

- More timely data release
- Creating new products such as the directory of establishments in the digitized cartography
- To have the support of the geography in the DCM to locate data in the place where they occur:

Georeferenced Statistics

Changing from paper to DCM is a complex process, but it worths it

A couple of questions for the audience:

1. What problems have you had concerning the use of the DCM in census data collection?

2. What advantages have you had concerning the use of the DCM in census data collection?