



Processing of Census of Population and Housing 2014: Scanning and Editing Case of Morocco

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I. Introduction: quantitative indicators

- 9,566,000 forms (A3+A4)
- 75 questions (28 individual questions, 47 households questions).
- 7 questions with national classification :
 - Profession (1): 11,315,401 labels with 892 professions
 - Industry(1): 10,301,176 answers with 650 industries
 - Diploma (2): 13,867,209 answers and 1,638 diplomas
 - Migration (3): 26,657,176 answers and 1,838 communes
 - **Which is about 62,140,962 labels**



I. Introduction: qualitative indicators

- 81% of households with at least one error
- 41% of persons with at least one error
- 5.8 errors on average per household
- 1.1 errors on average per person



II. Strategy

- Objective: publish results on time as planned
- Phase1: publish population count
- Phase 2: Publish variables pre-coded on the field
- Phase3: Publish results of variables with classifications

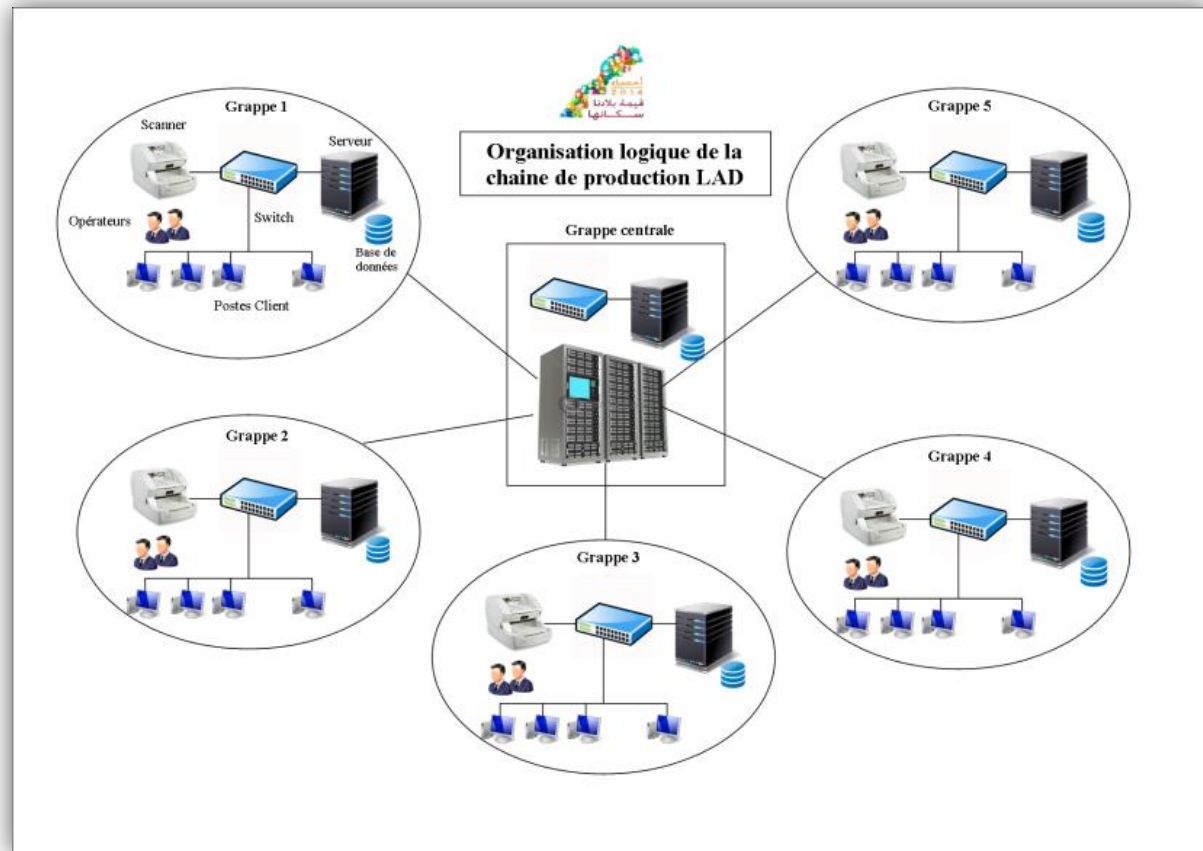


III. Processing steps

- Step 1: Scanning and Intelligent Character Reading (ICR)
- Step 2: Interactive editing
- Step 3: Automatic editing
- Step 4: Manual codification assisted with computer

Step 1: Scanning and intelligent character reading

- Scanning with high speed scanners
- Intelligent character reading
- Quality control (ISO)





Step 2: interactive editing

Data editing objective

- I. Identify and quantify errors in order to improve next census by reducing errors at the source (i.e. data collection phase)
- II. Provide statistics on data quality to users
- III. Identify and edits missing and erroneous data
- IV. Provide complete and coherent data



Step 2: interactive manual editing

Control rules

- Control of completeness at the census district level, housing units, households, and persons (Structure control of omissions and duplications)
- Validity control (105)
 - ▶ Ex : matrimonial status non valid
- Person consistency control(87)
 - ▶ Ex : Fertility recorded for male (consistency)
- Household consistency control(14)
 - ▶ Ex : several household heads
- Housing units consistency control(46)
 - ▶ Other sources of electricity not recoded for housing units with no public power network



Step 2: interactive manual editing

- Editing instruction
- Application (in house)
 - Access to images of questionnaires
 - Verification of control rules
- Two levels of editing
 - Operator
 - Supervisor
- Errors decreased by 62%

The screenshot displays the software interface for manual editing. On the left, a table lists control rules (MSG) with columns for NO, VALEUR, and ERRID. The center shows a data table with columns for NO, DOCID4, Q03, Q04, Q05, Q06, Q07A, Q07B, Q07C, Q07F, and Q09F. A red banner highlights an error in the Q07A column for row 1, with the message "Cette valeur n'est pas Valide". The right side shows a questionnaire form with handwritten entries. The bottom status bar indicates: CND : 425832 N° Logement : 011 N° Ménage : 01 Nombre d'erreurs : 11 | Nbr Val 0 | Nbr Coh 11 | Location : FM4L4.0000.1659.014

NO	DOCID4	Q03	Q04	Q05	Q06	Q07A	Q07B	Q07C	Q07F	Q09F
1	170032861	1	0	01	2	13	1979	1	1	
2	170032861	1	2	01	2	06	2008	0	0	
3	170032861	1	2	01	2	06	2011	0	0	
4	170032861	2	1	01	1		1969	1	1	
5	170032861	1	6	01	1			90	1	1
6	170032861	1	7	01	2			50	1	1
7	170032861	1	7	01	2			40	1	1
8	170032861									



Step 3: Automatic editing

Principles:

1. Satisfy all **controls** by changing the fewest possible items
2. Imputation algorithm should not use explicit **editing** rules
3. Verify that the **frequency** distributions of variables is maintained post-imputation



Step 3: Automatic editing

Method:

- Imputation of non valid and inconsistency items, persons and households
- Dynamic imputation using nearest neighborhood, which satisfies all control rules
 - ▶ Ex: Imputation of age using sex and relation to head of household



Step 4: Coding

Questions requiring classifications are not coded on the field

- ▶ Diploma
- ▶ Profession
- ▶ Industry
- ▶ Migration

Interactive coding: Key from image using look up tables of National classifications

ملفون التسميات

0. أعضاء الهيئة التشريعية، المنتخبون المحليون المسؤولون التسلسليون في الإدارة العمومية، المديرين وأطراف إدارة الم

1. أعضاء المهن الحرة الأخرى والمهنة

2. التقنيين والمهنة الوسيطة

3. المستخدمون

4. التجار والوسطاء التجاريين والماليين

5. المستقلون الفلاحيون، صيادو السمك، القابضون، القاصون والمستقلون الذين يشاهونهم

6. حرفيين وعمال مؤهلين في المهنة الحرفية (باستثناء عمال الفلاحة)

7. عمال وعمال يدويين في الفلاحة والصيد (بما فيهم العمال المؤهلين)

8. مسيرو التجهيزات والآلات وعمال التركيب والتجميع

9. العمال اليدويين، عمال حمل البضائع وعمال المهنة الصغرى (باستثناء الفلاحة)

X. اشخاص لا يمكن تصنيفهم حسب المهنة

التصنيف	أو الدراسة	المؤسسة	في المهنة	المهنة الرئيسية	القطاع	نوع النشاط	تصنيفات لوائح التصنيف
1	X	00	1	3	1	2	1
2	2	04					
3	3	05					



Thanks