L'EMPLOI DU WEB DANS LE 6EME RECENSEMENT GENERAL DE L'AGRICULTURE EN ITALIE

WEB USE FOR THE 6TH GENERAL AGRICULTURE CENSUS IN ITALY

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Synthèse

L'utilisation d'internet est une réponse inéluctable aux différents besoins pour une organisation complexe et à l'avant-garde.

L'Institut National itali de Statistiques (ISTAT) a réalisé un site internet polyvalent dans le but d'arriver à gérer les différents aspects du 6ème Recensement Agricole Général et prévoyant différentes fonctions: collecte de données, saisie des données, premier contrôle des données et production de données semi-provisoires, en étroite collaboration avec le réseau du Recensement et en communication constante avec toutes les personnes concernées par le Recensement.

Malgré ses nombreuses fonctions, le site internet "ad hoc" censimentoagricoltura.istat.it se propose comme un espace unique, spécifique, reconnaissable, à même de suivre pas à pas l'ensemble des étapes du recensement.

Cette notice a pour but de décrire à la fois la stratégie de communication et les outils utilisés pour atteindre l'objectif d'un site internet 2.0 en mesure de garantir une interaction avec les utilisateurs et de fournir un contenu à la fois traditionnel et dynamique ainsi qu'un contenu viral afin d'encourager la participation au Recensement.

En outre, cette notice explique la raison de l'ouverture d'un profil sur Facebook: les bénéfices attendus (en créant une communauté du Recensement, en augmentant l'accès au site, en touchant les jeunes et en se faisant connaître et reconnaître comme une organisation ouverte et novatrice) et les conséquences de l'utilisation de la force d'un social network. Sera également décrite l'expérience d'une interaction dans le cadre d'un dialogue constant sur des thèmes souvent imprévisibles – Facebook étant un espace où chacun a le droit de s'exprimer.

Cette notice décrira également l'ensemble du système internet composé de trois applications intégrées dans une seule plateforme: Système de Gestion du Recensement Agricole (SGR), Questionnaire online

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(ACQUIS), documentation Online pour les opérateurs (RETE). En outre, le contexte, le modèle organisationnel, l'architecture et les principales fonctions mises en place seront présentés.

Le choix d'une seule plateforme internet accessible à la fois par les opérateurs du Recensement et le personnel ISTAT s'est révélé avantageux pour différentes raisons: qualité des données, réduction de l'intervalle entre la collecte des données et leur diffusion, possibilité d'avoir une vue d'ensemble des données à l'état brut en temps réel de façon à corriger toute erreur éventuelle. Le système permet une collaboration étroite et complète entre le NSI et le Réseau du Recensement Agricole. Dans ce contexte, environ 13.000 opérateurs ont été impliqués dans les opérations du Recensement Agricole et environ 2 millions de personnes ont été interrogées et ont répondu au questionnaire publié sur le site internet, permettant ainsi d'accroître la complexité et la vulnérabilité du système.

Les différentes activités ont pu être contrôlées grâce à la présence d'indicateurs sur le questionnaire rempli; des tableaux récapitulatifs ont été calculés online donnant ainsi la possibilité aux opérateurs locaux de contrôler les chiffres pour leur territoire.

La plateforme a également été un instrument complémentaire à la méthode traditionnelle pour la formation des opérateurs. Dans ce but, une Section spécifique de Formation Internet a été mise en place en utilisant un logiciel ouvert d'apprentissage online fournissant toutes les caractéristiques nécessaires pour l'e-learning et la gestion de l'apprentissage. Des manuels, questionnaires, exemples de remplissage et des tests ont été inclus sur le site à la section RETE. Le site propose également une liste de FAQ ainsi qu'une documentation générale complète concernant les aspects légaux et techniques, au niveau international et national, afin de faciliter les activités des opérateurs.

Abstract

Using the web is an inescapable answer to different needs of a complex and up-to-date organisation.

Italian National Institute of Statistics built up a multifunctional web site to manage different aspects of the 6th General Agriculture Census including data collection activity, data entry, first data check and production of semi-provisional data, keeping in touch with the Census network, communicating with all the people interested in the Census.

Despite its numerous functions, the "ad hoc" web site censimentoagricoltura.istat.it is designed as a unique, dedicated, recognizable space and it follows the census operation in all its stages, changing step by step.

The paper wants to describe both communication strategy and tools used to reach the goal of a 2.0 web site, capable of ensuring interaction with users, providing traditional and dynamic content and viral content to stimulate participation to the Census.

Moreover, the paper is a report about the choice of opening a branded Facebook page: the expected benefits (creating a Census community, increasing access to the site, reaching young audience and being recognized as an open and innovative organisation) and the consequences of using the power of the social network. The experience of interacting in an ongoing dialogue on issues not always predictable -since Facebook is a place where everyone has the right to speech- will be described too.

The paper will provide a description of the whole web system that is composed by three web applications integrated into a unique platform: Agriculture Census Management System (SGR), On line questionnaire (ACQUIS), On line documentation for operators (RETE). Moreover the context, the organization model, the architecture and the main functions implemented will be depicted.

The choice of unique web platform accessible both from the Census office operators and Istat personnel has been advantageous for several reasons: data quality, reduction of the gap between data collection and data dissemination, possibility to overview raw data in real time in order to remove errors. The system allowed a complete cooperation between the NSI and the Agriculture Census Network. In this context, around 13.000 operators were involved in the Agriculture Census operations and around 2 millions units have been interviewed or answered the questionnaire thorough the website, thus increasing the complexity and the vulnerability of the system.

Monitoring activity has been possible through the implementation of indicators on questionnaire filled in; summary table were calculated on line giving the possibility to the local operators to check figures for their territory.

The platform was also a training tool for operators: a complement of the traditional method. For this purpose a specific Web Training Section has been implemented using, an open source online learning suite, that provides all features needed for e-learning and blended learning management. Manuals, questionnaire

compilation example and tests have been included in the website section RETE. A list of Frequently Asked Question has been implemented; moreover a full background documentation on legislative and technical matter, at international and national level, has been uploaded in the website to support operators activity.

Introduction

Nowadays, Web has made possible the direct access to information and its immediate re-use, a Copernican revolution for the communication of statistics: no longer a unique generalist dissemination, but a multi-directional communication, enhanced by a continuous feedback between statistical information producers and different users.

More than a technological change, Web 2.0 is an evolution of the use of the web in a social key. In particular, communicating 2.0 means: opening the information to different user needs through the production of open systems (regarding formats, languages, etc ...) and to be open to a direct dialogue with users to be recognized as an authoritative source.

The social interpretation of web has led a competition from below: blogs and wiki technologies are used to promote discussion; people use sites for download, update, explore, compare, exchange information. The excess and redundancy of information is also amplified by search engines that, flattening the perception of important data, make uneasy the identification and reliability of the source.

In addition, we have to interface a new web user: the so-colled "prosumer". The user isn't anymore a simple "reader" of the Web: the new web user is the protagonist of the Web. The prosumer plays an active role to disseminate, share, discuss, promote and improve information. The 2.0 user is "co-star" in the production of information, adding value to the original content.

New generation use web services for direct access to information. To win their trust, we must speak their language and offer them the right tools. So, putting the user in the center means giving them a chance to interact directly with our information.

More: the 2.0 audience is also made by other systems that interact with our sites through machine-to-machine services.

So we can identify three values of the web 2.0 for a statistical web site: first of all, reusable information. The devices you can connect with on the web are on the rise and statistical information should be disseminated taking into account this variety. To achieve this goal, it is necessary to make information available in a pure form, to give/access to different sources to create other added value information (through webservices for example is possible to produce mashup). A second important value is the use of social services: that means enter content on the net through existing social spaces (eg. presentations on Slideshare, photo gallery on Flickr, clips on Youtube); the third use of web 2.0 is to be present on social networks: use new channels of communication (Facebook, Twitter…), after a careful cost-benefit evaluation.

In a few words: using the web is, at the moment, an inescapable answer given to different needs of a complex and up-to-date statistical organisation. This is why the Italian National Institute of Statistics built up a multifunctional web site to manage different aspects of the Agriculture Census: collecting data, keeping in touch with the Census network, communicating with all agricultural holding's holders involved in the Census and even with the people simply interested in it. Finally we can say that the web has been a real multifunctional tool in achieving the 6th Italian General Agriculture Census.

1. Web as a communication tool

The 6th Italian General Agriculture Census web site has been a fundamental part of the communication campaign. Anyway, to better understand the role of the web in the communication strategy is useful to analyze the context in which the Census was conducted.

1.1 Traditions and new trends, how to give voice to a dichotomy

In 2010, the year of the Census, a new vision of Agriculture was developing in Italy. For instance, the number of "virtual farmers" was increasing: there were more and more people spending part of their free time cultivating virtual gardens on the Internet. Agriculture seemed to be an alternative, at least in the imagination,

to the foolish race of life of the businessmen. An activity strongly linked to the tradition was seen with different eyes.

The importance of quality products was increasing too. People today are more interested in healthy lifestyle. Agriculture can give an answer to this need through quality productions, biological products and quality – controlled labels. Technological innovation was increasing in the agricultural holdings, while young farms' holders were giving birth to new ideas to diversify their business (from school-farm up to renewable energy production). Anyway, a very strong tradition was still present in the Country and there were many elders as farm's conductors.

The 6th Italian Agriculture Census was than conducted in a context of strong dichotomy: innovation and tradition were strictly connected.

In this frame, the Italian National Institute of Statistics has selected and implemented a communication campaign able to:
- ✓ enhance new trends;
- ✓ show agriculture as a dynamic world;
- ✓ give worth to tradition;
- ✓ show Census as an opportunity to reveal the new profile of agriculture: a mix of tradition and innovation.

Tone of voice chosen to speak to the target was deliberately:
- ✓ lightweight , to remove the statistical burden;
- ✓ friendly, to emphasize the closeness of the National Institute of Statistics to the agricultural world;
- ✓ attractive, to encourage participation;
- ✓ authoritative, to give value to the Census

As a whole, the campaign included:
- ✓ Creation of a brand
- ✓ Advertising
- ✓ Public Relations and events
- ✓ Press office

All these aspects have found space on the website, from which they all have drawn visibility. First of all, the web site was a channel though witch to disseminate the knowledge of the Census brand, a strong vehicle of the Census meaning:
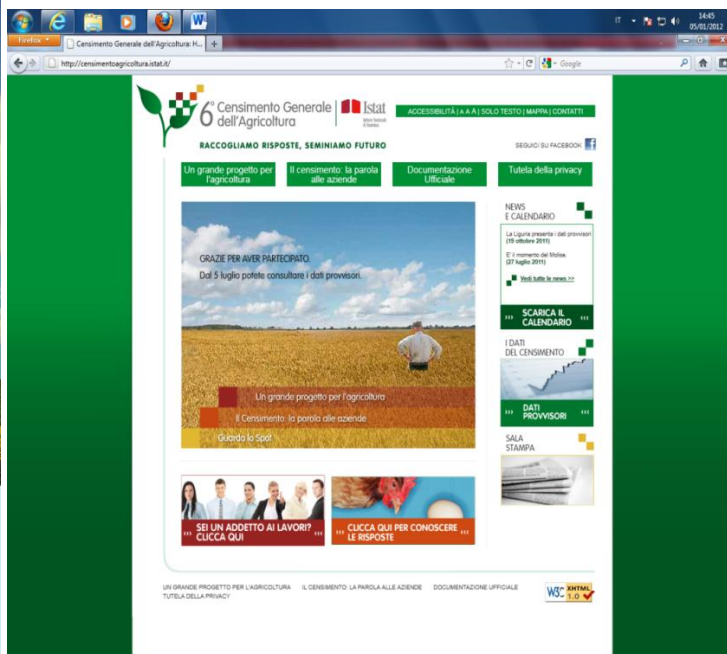

The brand shows a particular kind of shoot: it is the representation of an agricultural reality that evolves into pixels. Tradition (the fruit of the earth) and innovation (the symbol of technology) meet in a unique new symbol because the world that the Census wanted to photograph included both of them.

The symbol was completed by a connotative payoff: "we collect answers, we spread the future". The payoff summed up the mission of the National Institute of Statistics and the spirit and the function of the Census: collecting data to allow the institutions to intervene effectively, plan for and support more and better the Agriculture development.

The web site has also taken on the tv spot, that was the core of the advertising. The tv spot was realized by the animated-collage technique. As a soundtrack was chosen a well known lullaby, having the age and the familiarity of a strong root, but completely rearranged to take the rhythm and the energy of the future. The world changes. And agriculture is no exception, that's why during the tv-spot we saw the "old farm" (that's the name of the lullaby) creating a whole new farm made of new crops, new technologies, new skills, new ideas, new forms of environmental awareness. We saw the tradition evolving before our eyes and gradually transforming the past into the present, with a foot in the future.

While the head line of the ADV said "in the old farm there's a new farm", to underline the coexistence of tradition and innovation, a very simple but affective call to action was conveyed by the claim: "Agriculture

has changed, tell us in which way", so the target was called do fill the questionnaire because Census was fundamental to leave out the new face of agriculture. The use of the web as a very important channel of communication wanted to attest the innovative aspects of Italian agriculture.
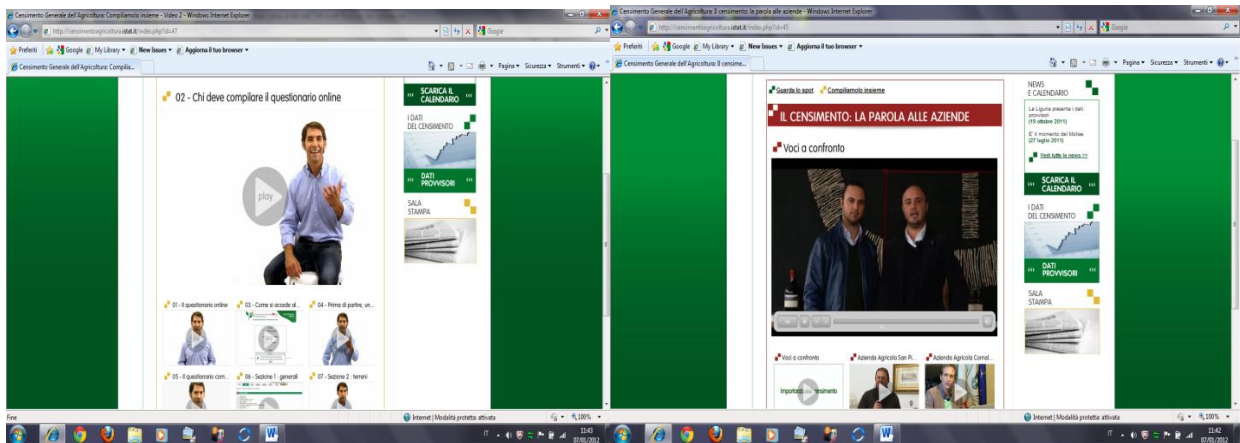

1.2 A friendly web site

The official Census web site was put on line in early August, to prepare the Census of 24th October. Three different releases were carried out, to follow the progress of the survey: the aim was to highlight the core aspects in each phase to the Census.

The Census's website was one of the primary means of communicating with the public. The success of the website should be based on the users' success in quickly finding what they are looking for and accomplishing their tasks.

The website was designed to communicate the census operation in all its stages, giving prominence to the characteristics of statistical information. The layout was characterized by elements of "humanization" (people and faces from the world of agriculture), campaign's colors, modularity and accessibility.

The site was a key element for communication aims but it was also a training tool: the interaction with users is the best way to deliver targeted information, provide timely responses to requests and questions coming from "low".

Traditional static and dynamic contents were combined with innovative contents. On a side: FAQ, press releases, calendar of the principal steps of the Census, laws and official documents, etc. On the other side, 2.0 communication elements and viral content with a multiplier effect to stimulate the participation to the census: video interviews to respondents, friendly and simple tutorials on the questionnaire and widgets embeddable on other sites with animated and interactive graphs and maps to follow the trend of the Census.
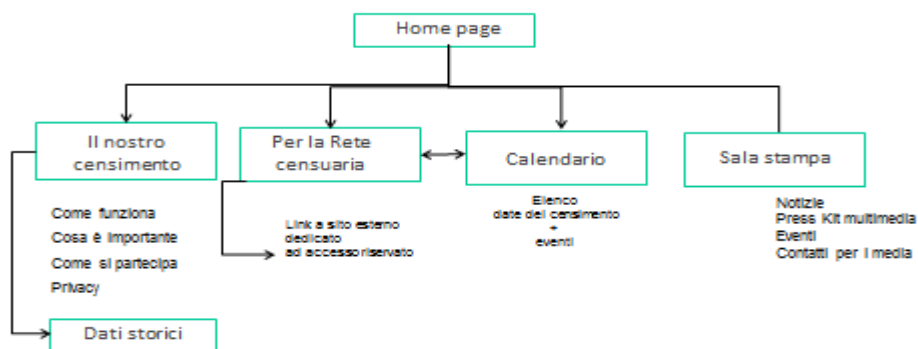
1.2.1 The site in three steps

STEP 1
- ✓ OUR PROJECT: Description of the census, News and topics of interest, Documents and reference standards
- ✓ OPERATORS AREA: Link to the site
- ✓ AGENDA: List of dates and a description of related activities.
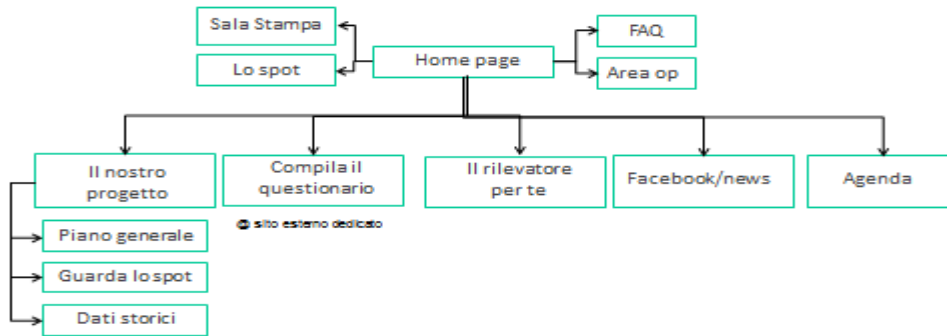- ✓ PRESS ROOM: First press releases / other materials.

STEP 2
- ✓ Primary goal is to compile the on line questionnaire. Therefore the navigation give priority to the questionnaire and contents related to it (tutorial videos).
- ✓ Then, other contents (press room, reserved area, calendar...) have a level of secondary importance compared to the questionnaire.

STEP 2

STEP 3
Ultimate goal: to communicate the data collection and to release results of the Census.

1.2.2 Technical aspects

The optimization of the portal for a correct and functional indexing on major search engines (SEO, Search Engine Optimization) started by the design and technical content of the site and it was directly related to the analysis of traffic generated on the web.

The site was located on an Istat server and was developed respecting the accessibility criteria and validity (W3C) and according to the standard technology used by Istat: Open Source Software, as defined by the Digital Administration Code.

The aim was to combine the accessibility for all users, with the usability and visual attractiveness in terms of completeness and flexibility of the content. The site was coordinated with the online questionnaire and Survey Management System (later with the release of the data warehouse), through graphic layout in line with the campaign image.

As a whole, the Census web was presented as a unique, dedicated, recognizable space.

1.2.3 "marketing" aspects

Another way of using the web was the dissemination of promotional information, as:
- ✓ SEM: search engine marketing, as a form of Internet marketing that seeks to promote the website by increasing its visibility in search engine result pages (SERPs) through the use of search engine optimization, paid placement, contextual advertising.
- ✓ DEM: e-mail marketing as a form of direct marketing which uses electronic mail as a means of communicating commercial or fund-raising messages to the Census audience.

6° Censimento Generale dell'Agricoltura | Istat
RACCOGLIAMO RISPOSTE, SEMINIAMO FUTURO.

Il Censimento è partito, il questionario è online.

Il 24 ottobre è partito il 6° Censimento Generale dell'Agricoltura, un grande progetto per dare un contributo di conoscenza al futuro del settore. I dati che otterremo serviranno infatti a orientare le azioni di sviluppo a livello nazionale e comunitario.
Per questo il Censimento si svolge in tutti i paesi europei. A trarne vantaggio sarà chi, come te, fa parte del mondo agricolo e anche dal tuo contributo dipenderà il buon esito del Censimento in corso.

Da quest'anno compilare il questionario sarà più semplice e più rapido.
Per la prima volta, infatti, il questionario del Censimento dell'Agricoltura è disponibile anche online. Grazie al sistema di acquisizione dati puoi censire online la tua azienda in totale autonomia. Puoi accedervi con la password che ti è stata inviata dall'Istat. Si abbatteranno così costi e tempi, con vantaggi per tutti:

PIÙ FLESSIBILITÀ	PIÙ SEMPLICITÀ E RAPIDITÀ	MENO COSTI
il questionario si può compilare in qualsiasi momento, tutto in una volta oppure a sezioni, salvando i dati e modificando le risposte fino all'invio definitivo.	una serie di video tutorial guida passo passo nella compilazione del questionario e il programma stesso prevede strumenti di aiuto e di controllo immediato.	il nuovo sistema via web riduce notevolmente i tempi di lavorazione e i costi complessivi a carico della collettività.

Come sempre, la privacy è garantita per legge. I dati raccolti vengono usati soltanto per scopi statistici e diffusi in modo che non si possa risalire a chi li ha forniti.

Sul sito http://censimentoagricoltura.istat.it/ troverai tutte le indicazioni e gli aiuti per la compilazione del questionario online. Per ulteriori informazioni è attivo 24 ore su 24 il NUMERO VERDE 800 098 571.

1.2.4 Building a community

At the beginning of October, a Facebook page, accessible from the official Census web site, was opened to be a support to the data collection. The previously aim was giving information about the Census, later, it was supposed to become a tool for dissemination of the first and provisional results.
The page collected more than 7.000 members and more than 21.000 comments and posts. The most frequent users of the FB page were enumerators who used the page both to get help in their work by the National Institute of Statistics and to exchange experiences with their colleagues. The FB page gave them the opportunity to build up a community. Suggestions, warnings, thoughts about the meaning of the Census were exchanged on the FB page and many posts have been published by the enumerators to communicate the end of their work and to say " thank-you" the FB page.
The FB page was also the space were the data collectors complained for what was not working in their work and every post had to be promptly reacted by the National Institute of Statistics.
For the National Institute of Statistics one of the most important consequences of using Facebook was the experience itself. More than communicating according to precise objectives, Istat has had to interact in an ongoing dialogue with stakeholders on issues not always predictable, since Facebook is a place where everyone has the right to speech, so that content control by the page masters was impossible. However, answering every time and as quick as possible was essential to maintain credibility. This incredibly frequent exposure, the speed of reaction time and the need to share the replies have led the Italian Institute of Statistics to a more precise definition of its communicating style, in other words its "brand character". In effect, the Institute went out of this experience more aware of itself and with a new consciousness about its willingness to transparency.

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Of course, a possible development, will be the creation of a handbook -suggestions in the use of social media channels as support instrument for future sample and census surveys.

In conclusion, by the experience of the Facebook page of Agriculture Census it is possible to deduce that:

- it is essential a constant monitoring of the channel through rapid action and clarity in the responses;
- it is important to base the page on a well-defined communication strategy. However, you must be ready to manage a crisis that may precipitate, being able to redirect the adopted strategy to maintain the control of the channel. Giving everybody the possibility to post a comment, is necessary to trying to anticipate every possible scenario that can be variable over time, defining in advance how to respond and interact with "friends" page.

Concluding, we can say that Social media monitoring is an important supplemental tool to identify the misuse of information, upcoming discussions and critics. To avoid missing relevant articles, blogs or tweets is necessary to search regularly and invest time and resources.

2 Web as a tool to support census operators activity

The web platform was also used for providing a training tool for census operators: a complement of the traditional method. For this purpose a specific Web Training Section has been implemented using DOKEOS, an open source online learning suite that provides all features needed for e-learning and blended learning management. Manuals, questionnaire compilation example and tests have been included in the website section RETE. A list of Frequently Asked Questions (FAQ) has been implemented; moreover full background documentation on legislative and technical matter, at international and national level, has been uploaded in the website to support operator's activity.

The training course for Census provided by the web service complemented the traditional classroom strategy provided in "fall" following a hierarchical system, as the training should reach more than 10.000 operators acting in different locations and in a constrained period of time. The main purpose of the web platform was to

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provide information about scope and content of the census in terms of legislative, technical, organizational aspects, and specific practical training for using the IT system implemented specifically for several census operations. The beneficiaries were all the Census operators: the Istat Territorial Responsible persons, the Census regional offices operators, the local responsible persons and coordinators and the Enumerators. Main guidelines were defined at Istat General Central Censuses Division and instructions were also prepared by them and and by regional Istat offices. The tools for transferring knowledge were slide, handbooks, and other basic documentation as European and National legislative acts.

The platform includes slides and tests for self-evaluation organized by theme. The themes list refers to:
- Context;
- Organization;
- Privacy rules;
- Census (calendar, definitions adopted, pre-census list, data collection);
- Questionnaire (divided into questionnaire sections);
- SGR system.

Tests could be accessed without a specific order and the users could visualize immediately the specific test result. The system gives also the score achieved by theme.

An example of a multiple choice test is provided in the following:

Specific videos were recorded and provided referring to specific topics. Moreover a questionnaire with helps on-line was uploaded in the platform.

The system allowed the release of specific feed-backs to Istat regional offices, as number of access performed by each operator and time spent on training sections, so that Istat officers could know if, for how many times and long the platform was used.

A web search service was also implemented to look for answers to specific operators doubts into the FAQ list. In total almost 600 questions and answers were provided. A first set of question was implemented before data collection started and updated with questions arising from census operators during data collection.

FAQ themes   Search tool

3. Web as a tool to manage the Census

The 6th General Agricultural Census, beyond the previously mentioned changes, featured other several organisational, methodological and technological innovations.
The first innovation regarded census strategy based upon the use and analysis of several administrative data sources which led to the construction of a pre-census list of agricultural holdings, which was used as the information basis of the census. The second innovation concerned the involvement of local regional departments in the entire census process and the establishment of different organisational models: the high-participation model in which the Regions (15 regions chose this organisational type) in fact participated in each phase of the survey, from collecting to recording data, to checking them and removing any errors and validating all data present in the questionnaire, and the supplementary-participation model which involved 5 regions which were responsible for the entire data collection phase, while for subsequent phases regarding

recording, checking, correcting and validating data they were limited to a subset of variables termed primary for the release of provisional data.

The third and perhaps most significant innovation regarded multi-channel data collection techniques. In fact, to supplement traditional paper-based data collection via face-to-face interviews conducted by enumerators, an electronic questionnaire has been prepared which can be used not only directly by agricultural holdings via Internet for self-compilation but also by data collection network staff for entering previously collected paper-based data.

It can reasonably be stated that the Agricultural Census was a wholly web-assisted census, achieved by setting up a complex software system structured in several components.

Specifically, the portal http://censimentoagricoltura.istat.it features three sub-systems, each integrated with one another through a user-ID and password-protected access system, constructed in accordance with security and confidentiality criteria under current legislation:

http://censimentoagricoltura.istat.it/ACQUIS for census questionnaire online compilation by agricultural holdings;

http://censimentoagricoltura.istat.it/RETE which is a documents repository accessible to census staff, containing all useful information for carrying out census operations;

http://censimentoagricoltura.istat.it/SGR is the core system of the census survey management, and is available to the national network in order to support the various survey-taking bodies in conducting the census during each of the scheduled phases of data collection, data editing, validation and monitoring of the collection and data editing phases.

3.1 The electronic questionnaire (ACQUIS)

The online data collection system makes it possible for agricultural holdings to complete the questionnaire electronically by accessing the Istat server that hosts the web-based data recording application.

The online questionnaire follows the paper-based version, making it possible for agricultural holdings to browse it by sections.

The programme simplifies the questionnaire compilation for the holdings by:

- automatic calculating arithmetical operations;

- reporting errors in data input, displaying the appropriate message and automatically drawing the user's attention to the point where correction is necessary;

- displaying additional messages on mouse-over of words or phrases requiring a brief explanation.

In addition, to simplify the compilation of the questionnaires still further the system allows various steps in processing the questionnaire: saving it as a draft, which enables users to enter data without worrying about

their accuracy, or saving a final version which entails the activation of control rules, and final sending. Obviously the agricultural holdings may choose to skip these partial saves and send the questionnaire directly.

The controls included in the questionnaire regard correctness and consistency; in the first case any error regarding a wrongly entered data item is reported, while in the second any inconsistencies between data items belonging to different questionnaire sections are reported. In order to minimize the statistical burden and online compilation being subsequently abandoned, it was decided to include a minimal set of controls by assigning data correction to other phases.

3.2 The network portal (RETE)

The information area on the portal is structured around two horizontal menu navigation bars which provide access to the various information areas.

Menu bar

An initial bar of (main) commands indicates, from left to right, the following sections:

Organisation contains a description of the organisational network established by the Regions and provides access to detailed descriptions of their census plans.

Tools contains documents which are also working tools for conducting the census. In addition to the Census Questionnaire (which can be downloaded and printed), this section also contains instruction manuals divided into chapters and documents that may help with the compilation of some sections of the questionnaire (support measures and codes).

Documents contains official reference documents for the 6th Agricultural Census.
The section also contains official documentation on connected topics, such as the main reference legislation in the field of agriculture and on the protection of personal data.
Finally there are publications which can improve knowledge of the census context.

Training contains training materials for the census network, including an interactive version of the questionnaire, instruction manuals divided into chapters and various slides that regard the content dealt with during the various classroom training sessions.

Glossary – contains definitions of the main concepts and terms used in census documents

Questions & Answers (FAQ) – contains the questions most frequently asked by staff in the census survey network, accompanied by standard answers

A second command bar of (secondary) utility indicates, from right to left, the following sections:

- Map (of the site)
- contacts
- forum
- links (to other linked sites)
- logout
- link to the Survey Management System (SGR - Sistema di Gestione della Rilevazione)

3.3 The Survey Management System (SGR)

In order to support the various step in the survey network in conducting the Agricultural Census, an information technology system able of managing the various phases of the survey has been implemented. More specifically, a dedicated application based on the use of web technologies has been set up, enabling data collection, data editing functions as well as that of monitoring the various data processing phases. The website set up ensures maximum data security during the data transmission and storage phases, in compliance with the National Statistical Institute's standard rules. The management system can be seen as a distributed workflow system in which each operator can work independently, following a clearly defined procedure. This design moreover has had to provide for the management of recycling in production processes (delete of questionnaires, changes of status, reactivation of check, etc.) to prevent any problems from becoming such that Istat can only work on them manually. This operating procedure has produced benefits in terms of timeliness, data quality and costs.
The system includes over 50 functions grouped by type and organised into 5 macro-areas:

QUESTIONNAIRES – includes all functions strictly connected to the survey (recording of the interview, data entry, data check, etc.)

OPERATORS – enables the survey network and user profiles to be defined and the agricultural holdings to be assigned to the various enumerators

SUMMARY REPORTS – includes a set of survey progress monitoring reports

SUMMARY FORMS – includes all functions for primary variables data collection and a summary of the primary variables necessary for publication of provisional data

UTILITIES – includes a set of network support functions spanning the entire survey process

The system constitutes one of the institute's major innovations insofar as – in addition to rendering network staff completely independent in managing the survey – it enabled the regions to participate actively in the data editing phase. It is precisely the data editing phase which merits particular attention.
This phase was managed via a bi-directional information exchange flow between Istat and its central data checking systems which are based on probabilistic methodologies and the network.
The continuous exchange of information between the central editing system and the survey network made it possible to process data in three phases of the procedure, yielding some significant results in terms of data

quality. The checking phases can be catalogued into three large groups: check during the data collection phase included in the electronic questionnaire, Micro-check and Macro-check.

The first type of check is incorporated into the electronic questionnaire. This phase ensures all checks relating to the domain of the variables and the correct somministration of the questions on the basis of the answers given to the filter questions. This phase also includes a number of checks regarding the mandatory presence of data and the coherence between the values of the main variables included in the various sections of the questionnaire.

The second type of check, termed Micro-check, was performed directly on the individual questionnaires collected via the web or recorded by network staff, and consisted of a set of rules exclusively of the deterministic type, classified into Errors (E) which compulsorily needed to be corrected, and Warnings (W), i.e. reporting of potential errors which did not necessarily halt the processing procedure.

The third type of check, termed macro-check, enabled probabilistic checking systems developed within Istat to be applied to the data in extremely short timescales (24 hours) in order to identify outliers. The results of the processing procedures, the outliers detected by individual questionnaire, were made available to the network, and census survey network were given the option of either confirming or correcting the data item after appropriate verifications in the field.

The System also provided a number of reports which enabled constant monitoring of the survey's progress and enumerators work. This monitoring had to integrate information which was diverse as a result of the multi-channel nature of the questionnaire, in terms of type of data collection, and depending on the different participation model adopted.

Furthermore, depending on the level of responsibility, information was provided according to the drill-down mechanism in order to explode the data item down to the maximum level of detail represented by municipality or by enumerator.

In view of the greater workload that the network found itself having to face in comparison with past experiences, bulk download of micro-data was guaranteed made available by the System.
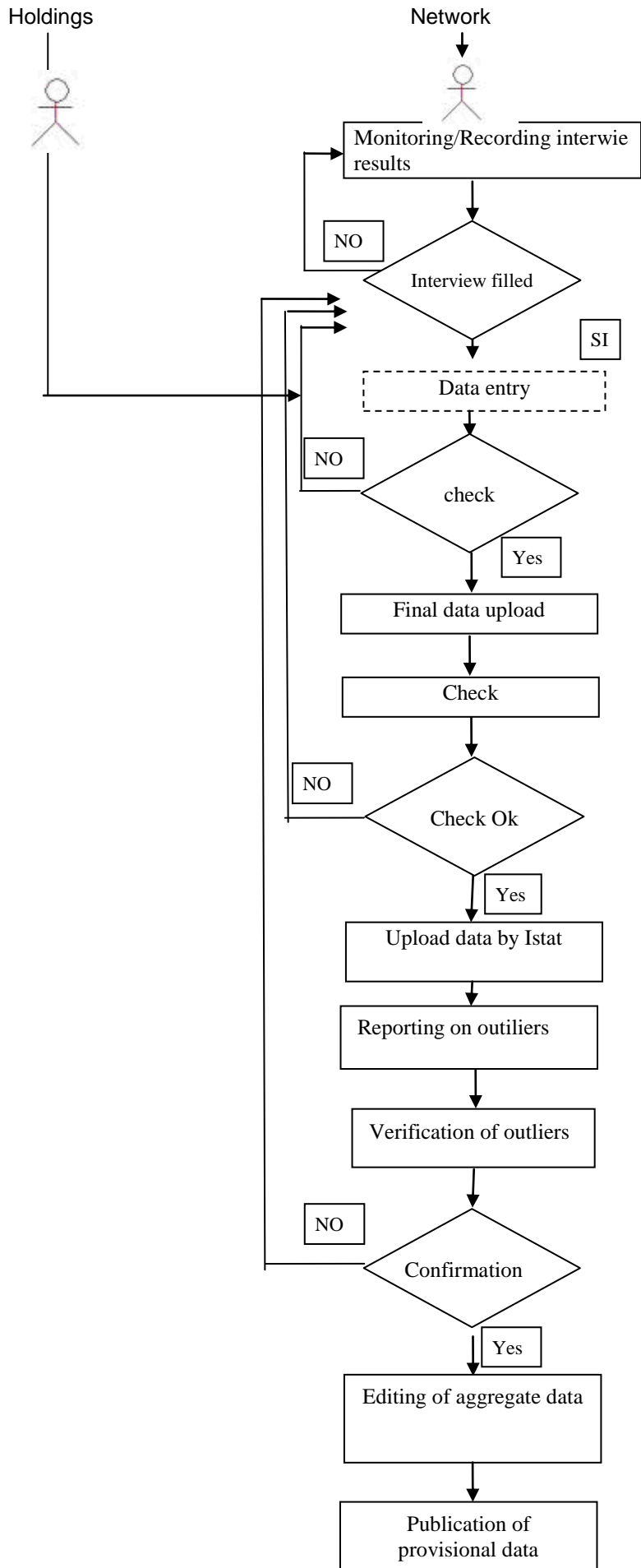
Given the sizeable number of data, download was offered via a flat CSV file format containing all of the information recorded through data entry.

In order to provide timely information on the progress of the survey and reach the provisional data production stage, all of the questionnaires collected via on-line compilation by the agricultural holding or interview by the enumerator had to follow a specific data processing flow. This flow entailed the following steps:

1. **Recording of the outcome of the interview**: before the actual on-line compilation of the questionnaire (the data-entry operation), authorised users had to record information regarding the type of interview conducted and the result of each interview. This operation is preparatory to questionnaire data entry. In the case of on-line compilation by agricultural holdings this function populates automatically

2. **Data entry**: authorised users were able to carry out data entry using the same web application that was made available to agricultural holdings.

3. **Check**: this control function, executable only after the final sending of the data, carries out checks on the correctness and consistency of data entered in a questionnaire. This initial checking phase was completely managed by network staff, and the solving of any inconsistencies is obligatory in order to move on to the next phase.

4. **Editing of aggregate data**: after compilation of the checking phase the data are collected definitively by Istat, and can no longer be modified by network staff. Istat carries out checks on the aggregate data (macrodata) , checks of the probabilistic type, and at the end of the process provides reports for indicating any outlier.

5. **Verification of outliers**: staff authorised by the URC must carry out the appropriate verifications which will lead the data indicated to be confirmed or modified within a specific time previously established by Istat. If the data have been modified, they must pass the checking phase once again in order to be congruent with the overall control rules.

6. **Editing of aggregate data**: Istat carries out the definitive check of the aggregate data as well as any possible entry, in the event of unresolved errors, and produces reports.

7. **Publication of provisional data**: the data thus processed are made public.

The operations described in points 1, 2 and 3 constitute phase I of the census data editing process, while those described in the subsequent points constitute phase II. Any errors detected during phase II of the process must be corrected by commencing from phase I of the process once again.

The workflow is represented in the following diagram.

Holdings

Network

Monitoring/Recording interwie results

NO

Interview filled

SI

Data entry

NO

check

Yes

Final data upload

Check

NO

Check Ok

Yes

Upload data by Istat

Reporting on outiliers

Verification of outliers

NO

Confirmation

Yes

Editing of aggregate data

Publication of provisional data

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3.3.1 The network management functions

In developing the applications, particular attention was given to the organisation of the extremely diversified and complex survey network. All Italian regions had to choose, before the beginning of the census, the working model they intended to implement. Istat gave them the option to choose between two participation models termed high participation and supplementary participation. In the first case the regions were asked to carry out the entire recording of the questionnaire, managing the checking phases through to consolidation of provisional data. In the second model, in contrast, it was sufficient to provide information regarding only the primary variables. Furthermore, within the high-participation model, the region could choose how to structure the survey network, while for the supplementary-participation model each type of geographical aggregation provided for by the general census plan (Regions, Local census offices,   municipal offices).
In view of the different workloads the two models were funded differently by the National Statistical Institute. The result was that all Italian Regions except for 5 chose a high-participation model.
The option to choose between the two models and the different geographical hierarchies compared with the traditional Italian geographical aggregation based on region, province and municipality caused a high degree of complexity in developing the data processing system, which in fact had to provide for two different workflows.
Irrespective of the participation model, all network staff members that used the System were recorded by their supervisors by means of specific registration forms. This operation was made essential for the creation of the user profile and password that enabled access to the system.
At the end of the census over 22,000 staff had been registered in the System. For security reasons profiles exclusively containing user names were created, which made it possible to trace all of the operations that had been performed on each individual questionnaire. In addition, the password was sent to the email address entered during registration and had to be compulsorily changed when accessing the system for the first time. The new password was recorded in the system using encryption.
Each supervisor could prohibit access to the System by users assigned to him/her at any time that he/she saw fit.
Each user was also assigned a profile which allowed him/her to see only the functions within their remit.
The attribution of profiles was carried out in a hierarchical manner by the census bodies. The use of the profile combined with certain roles was fundamental for the organisation of the work in that it meant that specific tasks could be created which allowed users to work only on functions within their remit.
Given the variety and number of survey networks within the system a function was made available to make it possible to see the composition of the network at the regional level with detailed information about each individual network component. This enabled dialogue between network staff and a greater exchange of information.
In addition to creating the survey network, the System has made it possible to assign to each enumerator and CIC (inter-municipality coordinator) those agricultural holdings within their remit by means of dedicated functions. This assignment was essential to allow this type of network staff to perform certain operations on the questionnaires. In view of the significant number of agricultural holdings which each region found itself having to allocate the various municipal departments, the System enabled both exact assignment and in groups.
Finally, the System made functions available to the network which enabled hierarchies to be created within the network, concretely linking enumerators to their coordinators and inter-municipal coordinators to their supervisors.

3.3.2 Indicators and summary reports for monitoring field operation and data entry activity

Monitoring of field activity has been possible as the outcome of the single interview was registered in the system and the calculation of specific indicators referring to it could be implemented. Data entry was also performed, thus - based on recorded values - summary table were calculated on line giving the possibility to the local operators to check figures for their territory.

The possible interview's outcomes identified in the questionnaire were classified in several classes as reported in the following:

B1) unit surveyed as agricultural holding;

B2) units not surveyed for the following reasons
- not found;
- for explicit refusal by the respondent unit;

- other reason;

B3) units surveyed not being an agricultural holding or doubled
- land only used for activity out of the observation field;
- never being an agricultural holding;
- agricultural land or livestock holding definitely abandoned;
- agricultural holding completely rented or sold;
- unit in list twice.

In real time the SGR system could provide the number of questionnaire recorded by kind of interview's outcome, thus giving the opportunity to any census operators to verify their own activity (in case of enumerators) or the one of the people assigned to them in the hierarchical organisation system, both in terms of total figures or by specific operator. This made possible to verify speediness of the field activity and to immediately identify criticalities, connected to specific census offices or operators activity, to specific area, to specific outcome, making possible to face and manage them and to formulate appropriate specific solution both at global and local level. The effectiveness of the process is increased by the fact that the solution could be applied in real time, when field operations were still going on.

The indicators calculated – at different territorial level, by operator, etc., - for this purpose are:

a. *percentage of units with an interview outcome out of total assigned units*;

b. *percentage of units by outcome type out of total units with outcome*;

c. *differences by outcome recorded at local territorial level and national average*;

d. *trend of index number by outcome type*.

As the list of units to be surveyed has been derived from a complex process of administrative data source integration, each unit was also connected to one or more specific dataset of origin. Thus the outcome of the interview could be also analyzed according to them, as the indicators defined above. Each list used originates from a different administrative process and rules for a specific unit inclusion, so that each list could be characterised by over-coverage or under-coverage, when statistical definition is applied to the specific units in list.
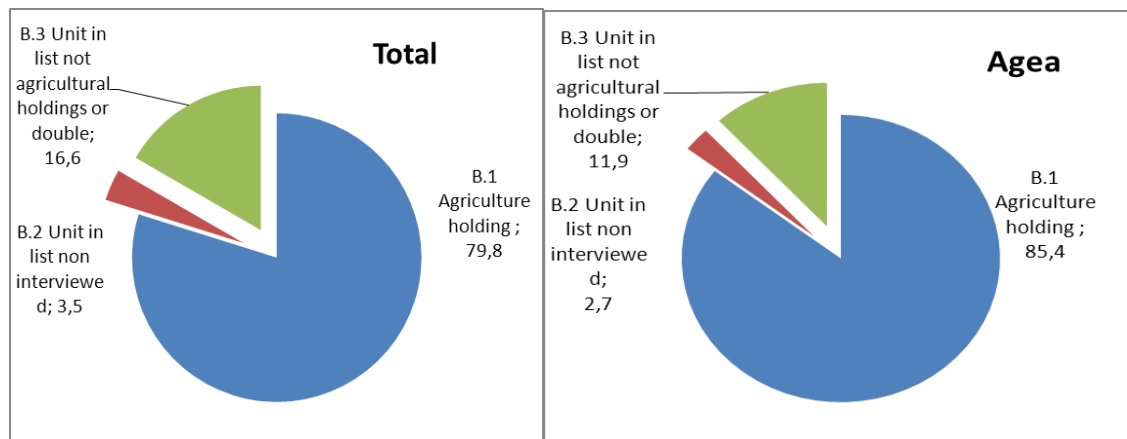
Particularly, the main national archives agriculture/land oriented have been taken into consideration as: i) the Integrated Administration and Control System (Agea); ii) the System for the identification and registration of Bovine animals and other species (AA.ZZ.); lands' property incomes (Tax Agency); land registry. Moreover other general administrative sources were used as the one of the Chambers of Commerce (CCIAA), the Fiscal Register (FR) and VAT declarations. Also relevant statistical sources were added.

The main administrative database used is the Agea one, updated by the Italian Paying Agency, including farms data (identification data and code, structure and parcel or stable location) for units applying for economic and financial support as provided by European regulations, defined under the Common Agricultural Policy.

The interview outcome classified as *refusals* and *units not being an agricultural holding* have been treated with particular attention, especially when the unit was included in one of the lists considered more reliable (i.e. Agea data base) or whether the information connected to it made it relevant (for having either a large physical or economic dimension). In most cases those kinds of unit have been re-contacted and figures previously registered checked and eventually changed.

In the following graph an example is presented on the indicator *percentage of units by outcome type out of total units with outcome* calculated both at national level and for the specific Agea archive, the one that scored the best percentage of B1 units (85.4%), while at national level this percentage was equal to 79.8. It has to be stressed, that the pre-census list was deliberately kept abundant in order to catch all the units fitting the statistical agricultural holding definition.

Graph 3.3.1 - Indicators on interview's outcome at national level (total and for Agea archive)
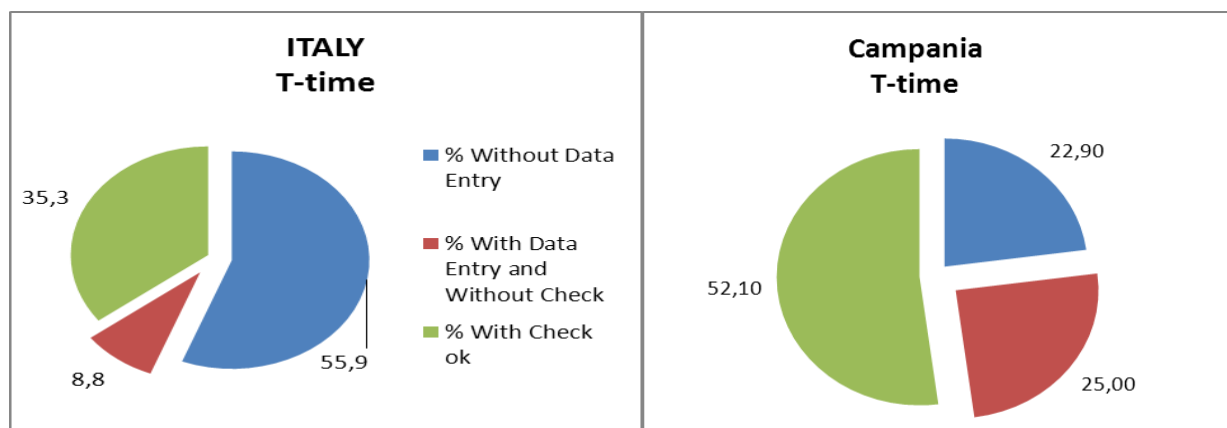

Once interview outcome was recorded, the data entry has been performed and first set of checking rules have been launched so that data checking phases took place. Referring to those activities others summary reports were provided by the system, as:

   a. *percentage of units with data entry out of total interview outcome*;

   b. *percentage of units with data entry by kind of check phase (without check ok, with check ongoing, with check ok).*

An example of the comparisons performed is presented below at national level and for a specific region at a specific time, while data collection was still going on. In the example, the Campania region - at a specific T time, was performing better than the national average, having 52.1% of the questionnaire with data entry and check ok, while at the same time the national average was 35.3%.

Graph 3.3.2 - Indicators on state of working process for the questionnaire at national and regional level

Once data entry and check had been performed, the registered data have been used by the system to implement summary tables containing figures referring to the following variables:

   c. *Number of holdings*;

   d. *Total holding area*;

   e. *Utilised agricultural area*;

   f. *Land by main crops categories: arable land, permanent crops (excluding vineyards), vineyards, kitchen garden, permanent grassland*;

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g. *Livestock specie: cows, buffaloes, equidae, sheep, goats, pigs, poultry, rabbit, ostriches.*

Figures were related to each unit interviewed by the operators acting in a specific office/area, and to the actual holding headquarter location as defined by Eurostat. As the interviews were conducted at holder residence, the two summary tables mentioned above could be quite different. Thus recording the holding headquarter location as one of the primary variable allowed data calculation at territorial level taking into account of it. This also allowed comparison of 6th General Agricultural Census results with the ones obtained in the previous agricultural census.

As previously mentioned in § 3, for 15 Regions performing data entry for the full questionnaire at local level, also other primary variables were released at the same time.

4. Conclusion

It can reasonably be stated that the 6th Italian General Agricultural Census was wholly web-assisted. The advantages of operating in such a way was evident in each phase of the census, giving the possibility of increasing awareness and participation of the public, both general and agriculture census targeted, increasing the speed of each phase and finding solution while survey operations were still on going, improving transparency and dialog with local census operators also during data check and imputation.

The Census's website was one of the primary means of communicating with the public. The success of the website should be based on the users' success in quickly finding what they are looking for and accomplishing their tasks. The website was designed to communicate the census operation in all its stages, giving prominence to the characteristics of statistical information.

In order to achieve the mentioned goal a complex software system structured in several components was set up. All census phases, were supported by specifically designed sub-systems included into the portal http://censimentoagricoltura.istat.it.

The Census involved the activity of nearly 13 thousands enumerators, to which coordinators and other operators of census bodies have to be added, for a total of around 22 thousands operators. Moreover, more than 100 Istat Territorial Responsable Persons, working in Istat regional offices coordinated and monitored the census operations at local level, starting from census planning, implementation till the final phases of data collection and check. Istat gave the possibility to Regions and Autonomous provinces of organizing in complete autonomy the census bodies at local level, according to existing law and/or administrative bodies already existing in the specific territory involved. Thus, given this flexibility and the mentioned operator's number involved, it can be stated that the system achieved a paramount complexity in order to manage functions and data connected to each specific operator profile.

Some of the results obtained, at the end of the census, through the use of the system, are provided below. 2,050,000 units that were surveyed through the census were collected and recorded. 1,352,000 questionnaires were returned on-line by network staff: 66.0% of the total (including all possible interviews outcomes). The primary variables included accounted for 31% of overall data, or 636,000 questionnaires (only the ones of units being agricultural holdings). Around 3% of units responded on-line, returning a total of around 62,000 questionnaires.

Moreover, the functions active in the SGR system and the work flow adopted made possible the publication by Istat of all the previously mentioned figures at Regional level as provisional data, only eight months later the start of the census field operation (that was at the end of October 2010). The relevance of this is due to the fact that 84 variables and 152 modalities were released for all Regions, and another set of data referring to 94 variables including 225 modalities, were released only for the Regions operating with the high-partecipation model.

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