ICT and typical products: an analysis of Italian farms

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Abstract

The paper discusses the final results of research into the use and impact of ICT on a sample of firms in the Calabria region of southern Italy processing typical food products (salami, citrus fruits, oil, cheese) certified as PDO or PGI. The specific sample was chosen for two reasons: on the one hand to assess the compatibility of ICT in firms where production follows historic and territorial traditions, and on the other to test the hypothesis that the use of ICT in firms processing food products of certified quality should ideally present a greater, more significant impact. The results let us know some characteristics concerning with the introduction and usage of new technology in the examined farms.

Keywords

computer use, typical Italian products, intensity of innovation, agricultural software use

JEL Classification

Q12 - Q16 - O33

1. Introduction[1]

In the actual economic scenery, with highly competitive and developed markets, the innovation, considered in its multiple components, represents one of the principal and irreplaceable element on which the production's development is found. In particular, the literature of the beginning of 90's years shows the importance of information technology in the companies for the creation and the improvement of productivity either in the agricultural field or in other ones.

[1] This paper has been written by two authors. The 2nd and 3rd paragraphs have been written by Privitera; paragraph 4.1 and 4.2 by Platania; the introduction and the conclusion have been written together.

The New Technologies are instruments which, if well handled, allow a Firm to obtain a competitive benefit plus an economic and structural growth in the market.

Furthermore the economic globalization of the markets, the competition of emerging Countries, with the variations of values and life style of the consumer's needs, require, in each economic field, the adaptation to the new technologies in order to take the opportunities of the " large market" and of the free trade.

There is a big necessity of identifying the adoption of the Information Communication & Technology (ICT) in the agribusiness sector and also to estimate the impact and verify the users and variables that influence the adoption. This paper has the purpose to analyze the relations between the New technologies (Innovation and Communication Technology) and the typical productions of agro-business. The study is focused on the actual status, in terms of consistence and way of usage, of the New Technologies in the primary Italian field. Afterwards the paper will introduce the results of the empiric analysis created with reference to some of the typical products of Calabria.

2. New Technologies: structural aspects and social-economic impacts

The computer application and its "capacity" to provoke technological changing, either in the hardware or in the software components, have modified the functioning and setting of the economic sectors with remarkable consequences also in the agro-business market (Varian et al., 2004).

Many studies and applicative investigations, in particular of the foreign literature, have analyzed the agro field application. These studies have found the principal factors of the adoption in the social-economic characteristics of the "informatics exponents" and in the relative consequences of the firm growth and competition.

In particular some authors point out the positive role of the social characteristic in having an ICT firm in terms of the farm-manager (i.e. young age and good education) and of the activity profits (Streeter et al., 1991; Baker,1992; Lewis, 1998; Gloy, Akridge, 2000; Rosskopf, Wagner, 2003). Other authors have investigated on the negativities related to the no use of the information technologies, due to decisional and economical reasons, also easily understandable, since the market is focused on the low costs, so that the planning of innovations regarding these technologies have been put aside (Platania, Privitera, 2003)..

At the moment in Italy, there are 28.516 Companies using information technologies. We need to precise, the employers and studiers know about it, that the official statistic is very deficient concerning with annual data .At the moment the employment has found a prevalent application on the administrative services: with the PC it's possible to manage with the technical and economic aspects of the Company, both in the raise up of the data and analysis of the Company efficiency and in the planning as well (figure 1).

Further more the automatic information management regarding the cattle- breeding and /or the cultivation allows to manage with a huge quantity of data, often hard to take manually, where the necessity of a double check determine the needs of a new technology .

The process of the diffusion wasn't uniform in the all Country but in different times and ways in North, central, south Italy, recognizing reasons related to the time and to the quick development of software house in the central-north areas rather than the southern ones as well as the programs dedicated to the animal husbandry and cultivations not adequate to the Italy South (La Via, 1993) with the consequence of a numeric discrepancy of the computerized Companies.

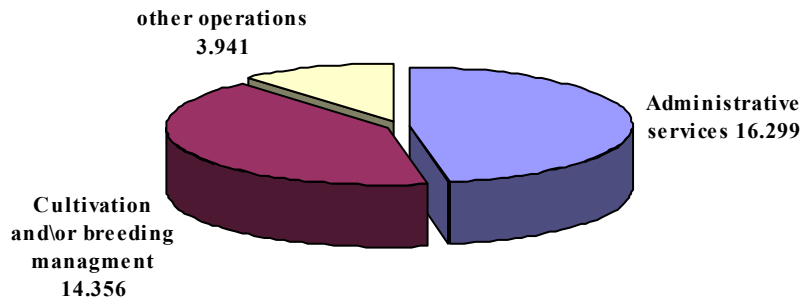

Figure1. Farms with information outfits and main usage

Beside the technological tools, the virtual commerce represents for the Companies an instrument with a potential development, although the economic growing level reached from the e-commerce in Italy is still inferior if compared with to the other countries of the European Community (the incidence of the sales on line over the total sells at a retail represents just one perceptual point while the European average is equal to the 2% and it is 5% in USA) (Anee Observatory 2004).

In Italy there is an increase either of internet users or shoppers on line: shoppers are about the 10th % of all internet users; the latter represent more than 38% of the population (Nielsen 2004). In particular the each medium purchasing numbers has increased on the web (from 2,2 on 2003 to 3.3 on 2004), with a minimum "giving up rate", agreed upon the interruption of purchasing procedure on line (Anee 2004).

Further more the diffusion of information technology has strongly changed the culture and the style of various Italian families; in the 2004 it has pointed out an increase of more PC in every house (14,2% more than 2003), with an addition of 17% of cost for technology and services (Federcomin – Anie 2004).

According to the internet use report, about 34% of Italian farms have an internet access to sell their products and more than 29% of these farms use internet in order to acquire technical instruments for their farms (figure 2).

Analysing the Regional situation, we can notice how the economy in Calabria has increased and changed in the last decade; the more significant aspect of this transformation has been the role of the agriculture in the whole regional economy.

While in the 1951 the farming represented just the 43% of the total regional income, in the 1994 the same data is equal to 7,8 % (V ISTAT Census). The Calabria's agriculture is characterized by a strongly polarized aspect of the farms, in terms of physical and economic dimension. Based on about 196.000 farms, 90% of them have a UAA below 5 hectares; farms with more than 50 hectares are lower than 1 % even if they have about a fourth of the total space (ISTAT 2000). Business areas are strongly fragmental in not neighbouring plot of land.

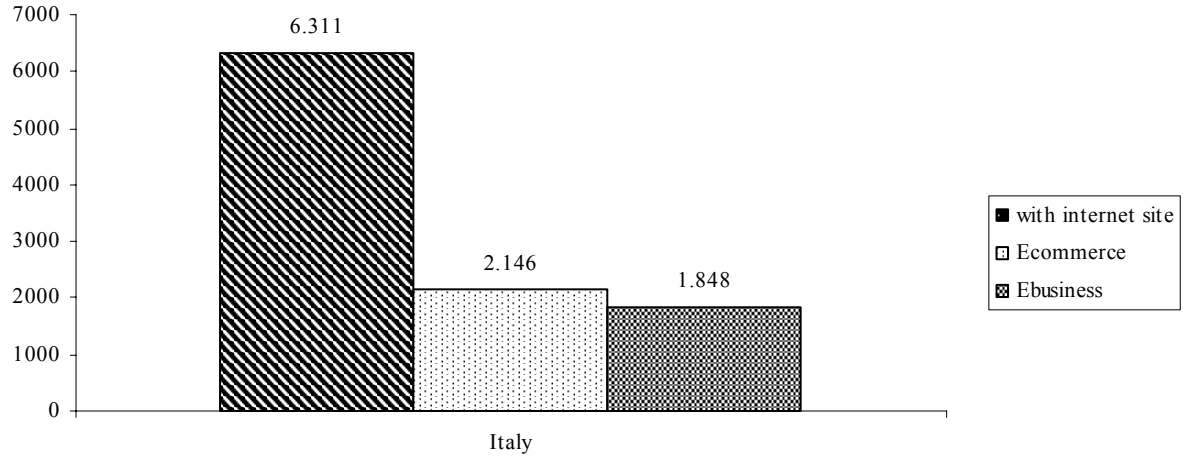

Figure 2. Farms with the usual use of internet

The reasons of this bond have to be found in the social roots of the agriculture and in the poor dynamism of land market, due to the lack of capitals. After the introduction of technology, the agricultural production has greatly changed in using, for example, of mechanical works replacing the

numerous manual operations as well as the changes of production firms, but in general the activity is still artisan.

Looking Tab. 1, we see that the most UAA dimensional class (50 and over) weighs heavily on the numbers of technological companies, where people are above all keen on administrative services (62, 5 %). In Calabria, a large proportion of commercial farms show an "innovating" position thanks to the Internet adoption, although being just 1,9% of the National data and 8,7 % of the total South Italy data.

Table 1. Farms in Calabria with information technology as per UAA type and their principal use*

Type of UAA	Total		Administrative services		Cultivation a\or breeding		Other operations	
	n.	%	n.	%	n.	%	n.	%
Without land	24	4,7	23	7,3	12	6,3	11	16,2
< 1 – 2	73	14,4	24	7,6	32	16,8	17	25,0
2 – 5	63	12,5	32	10,1	24	12,6	9	13,2
5 – 10	67	13,2	38	12,0	22	11,5	8	11,8
10 – 20	84	16,6	55	17,4	28	14,7	8	11,8
20 – 30	39	7,7	28	8,9	14	7,3	3	4,4
30 – 50	55	10,9	43	13,6	20	10,5	6	8,8
50 ed oltre	101	20,0	73	23,1	39	20,4	6	8,8
TOTAL	**506**	100,0	**316**	100,0	**191**	100,0	**68**	100,0

(*) Source: our elaborations on Istat data - V general census on agricultures

3. Methodological Notes

At the moment, from the relative official statistic point of view, there isn't a systematic analysis that allows us to see evolutions regarding the use of the technologies in the Agro-business Companies; so, in order to reach the pre -established goals, the study has only been evolved in an explorative way.

The investigation has been developed through the information from the Companies belonging to the consortia that take care of the quality of the product. In a particular way the studies have been focused on the firms that produce/transform the following products made up and certified in Calabria: DOP Calabrese Salami (sausages, bacon, "capicollo", "soppressata"); IGP "Clementine"; DOP "caciocavallo silano" cheese; DOP bergamot essence; DOP "Bruzio" oil; DOP "lametino" oil.

After the definition of universe equal to 39 Companies obtained by the information taken from the same consortia, the statistical interviews have started by phone calls. The test, specifically created for those people, was based on different questions and information: firm characteristics, the consistence of the hardware and software, the instructions to use the computers, the knowledge regarding some agriculture services on line.

Further more we also have taken some info concerning the social economic data of the firm ICT administrator, the frequency and use of the Pc and the reasons of its application, the email and management of a web site.

Finally, the results of this test have been elaborated, first of all through a descriptive statistic (frequency and correlation index) and afterwards particular tables have been elaborated in order to remark the more significatives relationship.

4. Information technology application in the qualified agro-business farms in Calabria

4.1Principal results of the studied sample analysis

Looking at the general characteristic of the examined sample, in particular at the geographic distribution, this is based on the consistent presence of companies in the Province of Cosenza (59,1%), following by Reggio Calabria and Catanzaro. This kind of distribution is linked with the certified production characteristic, considered during the investigation.

One of the considered economic differences is the sales proceed (Tab. 2). In spite of reluctance to answer to this question (the "no answer" represents 56,3% of the sample), the final data is really interesting and provided us useful remarks for our investigation. It has been showed that a little percentage is represented by the firms with a sales proceed lower than €240.000. The large percentage is represented by the intermediate firms with sales proceed between €240.000 and €500.000 and the one immediately in the range between €500.000 and €1.000.000 (12,8% and 10,3% respectively)

Table 2. Annual Invoiced classes as per pertaining to the technology typology of the examined companies (%)

Economic Classes (€)	Citrus fruit	Cheeses	Oil	Salted meats	Total sample
<240.000	2,6	-	2,6	-	5,2
240.001-500.000	5,1	-	2,6	5,1	12,8
500.001-1.000.000	5,0	2,6	-	2,6	10,3
1.000.001-7.000.000	-	-	-	7,7	7,7
7.000.001- 40.000.000	7,7	-	-	-	7,7
No answer					56,3

Source: our direct research

Regarding the first category of information, in all the examined examples, the ICT responsible is usually a young man with a medium culture (Tab.3). Usually no IT specialist is present. The choice, the management and maintenance of the Pc and in general all the software tools are delegate to external consultants who works in the territory and have the trust of the business – owner.

For this reason this figure has one or two roles. In particular there is a high percentage in which the two roles, information and administrative responsible, are the same (38.5%).

Table 3. Main information of the information manager (%)

Age: 25-39 years	56,4
Sex: male	51.3
Studies	
Secondary school	10.3
High school	53.8
Degree	30.8
Coincidence between the information and administrative manager	38,5

Source: our direct study

Concerning the software characteristics, based on the different gained information, operative and applicative systems characteristics have been considered to be used in a company. For the use of the New Technologies in the examined companies, it is present an hardware for a professional use (37 cases over the studied 39's).

Furthermore it is really interesting the presence of companies which use DOS system, even if in a limitative numbers, linked to "old" video-writing and\or book – keeping systems. In general there is an updated system because in the 66.7% of the examined cases there is the use of the last updated version (Windows XP). There are few presences of no traditional systems, for example Linux, while it is totally absent the Mac Os systems (tab. 4).

The analysis of the applicative systems shows a high presence of software used for administrative services, I mean book- keeping, in which other Office packet (Excel and Access) is used for "generic" purpose (mostly an input and output documentation).

Concerned the hardware, the examined companies have different characteristics but linked to their own technical and economical dimension. Regarding the numbers of Pc in a company, the most

important range is between 2 and 5 PCs (46 %), with just 1 Pc (18%) and those ones between 6 and 10 PCs (15%).

Table 4. Software aspects in the examined companies (%)

Used operative system	
Dos	5.1
Windows 98	33.3
XP	66.7
Linux	5.1
Apple Mac Os	0
Applicative Software used	
Book -keeping	92,3
Traceability Management	64.1
Cultivation Management	10.3
Herd Management	2.6

Source: our direct study

In most of the examined companies there are the necessary "peripherals" like printers (89,7%), above all laser jet. Moreover there are laptop PC in 69,2 % of the observed cases in which there is the mobility demand.

Table 5. Important information concerned the adoption and use of internet in the examined companies (%)

Cabling and use of internet before 1997	12.8
Cabling and use of internet between 1998 and 2000	30.8
Presence of e-mail address	87.2
Presence of company web site	56.4
Shopping on Internet (e-business)	23.1
Sale on Internet (e-commerce)	20.5
Commercial services on line	15.4
Relationship with public administration on line	35.9

Source: our direct study

In the examined sample the use of World Wide Web is recent (Tab. 5). Just 12.8% of the Companies had a Internet adoption before 1997, while 30.8% of Companies had obtained it between 1998 and 2000. Most of the Companies has an e –mail address, while just half of the Companies (56,4%) has the web site.

In the examined Companies the use of internet is not well pointed out as a commercial instrument. Just 23.2% do shopping on line for the Companies purpose and just 20% use internet as an instrument for a sale. It is interesting to see the percentage of internet use: there is a little group of Companies (35%) which use internet for the relationship with Public Administration.

4.2 Important Focus on the information technology application

Since it is important to deeply verify the information got by the empiric research, we did several tests of linear association. To gain this result specific tables have been elaborated in order to see the more significant relationship between some couples of variables. In particular Tau-b di Kendall[2] has been used, a not parameter measurement of correlation for ordinals variables.

Table 6 shows the association between some elements taken from important information, considered really characteristic for the examined companies. It is deeply evident the "strong" relationship between e-commerce and e-business, due to the material and immaterial characteristics linked to the adoption of virtual commercial system.

Table 6. Variables Association

Variables		Value	Signif. appros.[3]
E-commerce	e-businness	0,824	0,000
Numbers of PC in a Company	Not updated Software	0,345	0,003
Numbers of PC in a Company	Aspects of internet connection	0,361	0,025
Numbers of PC in a Company	Quality Certificate	-0,462	0,000
Numbers of PC in a Company	Company Web site	-0,157	0,258
Study title of the information responsible	No professional use of PC	-0,356	0,004

Source: our direct study

[2] The sign of the coefficient shows the direction of the correlation and the absolute value is the intensity. The range is [-1:+1]

[3] The significant observed level is estimated with an approximation. Therefore the provided significant level is not valid but it is based on a formula that usually gives results close to the reality.

It is really interesting the relationship between the number of PCs and the no updated software, because it show the difficulty for the Company to do update using consistent hardware.

Furthermore it is interesting the relationship between the variables regarding the dynamics business and those ones connected to the hardware consistence: in those Companies where there are numerous PCs there is a inverse relation with the presence of voluntary quality certifications (ex.: ISO 9000), with a proper software facility or even with a presence of a Internet web site.

5. Final conclusions

From the results, we assume that there is a growing interest for the new technologies, even if we still need internal and external supports in order to better lead the exact investments for the Company.

There isn't a connection between the company and the value attributed to the technology. In the firms producing certified goods, the predisposition to the quality seems also to involve the innovation that, according to a statistic, will find a collocation in the firm investment plans. This policy will give the reasons for a better check of the costs focused on a reduction, more services and on a growing learning, really important and necessary qualities for the firm's sake.

The pre-conditions for the ICT development of the firm are referring, in particular, to the presence of "Firm referent expert", to the distribution of computers among the employers, and to the support of the external qualified corporate adviser.

Although we need to precise that the investigated firm typologies are characterized by a strong company-family connotation that boasts of solid relations with the territory; indeed all firm processes are based on the professional experience and qualification of the manager that has more roles in the Company.

From the analysis related to the firms with internet connectivity, the best and simple tool for the interaction with the world wide, it's proved that those that utilized the Portal just for information and promotional reasons represent the majority part; it is minor the number of firms using the Internet for e-commerce purposes.

Further more the digital world approaching, that expects new ways of working and interacting, opportunely codified, represents an environment where strategies and social dynamics are at the same level of the technologies or have priority in certain cases.

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