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SECTORAL STUDY

E-COMMERCE OPPORTUNITIES AND CHALLENGES FOR START-UP AGRIBUSINESSES

Project Leader: George Kartsiotis
Researchers: Amaxopoulos Ioannis, Hristu-Varsakelis Dimitrios, Misirlis Nikos, Vlahopoulos Apostolos, Ziakis Christos

PLANNING AND IMPLEMENTATION : **AMERICAN FARM SCHOOL**

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Agriculture · Environment · Life Sciences

New Agriculture for a New Generation:

Recharging Greek Youth to Revitalize the Agriculture and Food Sector of the Greek Economy

E-Commerce Opportunities and Challenges for Start-Up Agribusinesses

Project Leader: George Kartsiotis

Researcher(s):

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Executive summary

The aim of this study was to analyze the requirements and needs of agribusinesses for e-trading, e-marketing and e-services as well as to identify best practices in e-commerce solutions and mobile applications development, that have already been successfully used on a national or an international level. Our methodology included review of various types of online agribusiness platforms and mobile applications, an extensive literature overview, structured questionnaires, interviews and focus groups with involved stakeholders as well as drafts and system model construction.

We applied forty criteria to fifty online platforms, twenty one criteria to twenty two mobile applications and in both cases we analyzed the statistical results and combined them with our empirical approach. Our literature review included extensive analysis of more than thirty articles from peer reviewed journals, white papers, conferences etc. and a table of keywords for future reference is presented. For the stakeholders needs and requierements our methodology included: i) questionnaires to one hundred and ten students, ii) participation in thirteen interviews and iii) two focus groups with thirty two participants.

Our findings include an informative and brokerage model based agribusiness informative portal, featuring i) options for b2b and b2c e-commerce, ii) digital marketing focused on social media and search engine optimization techniques, iii) agricultural and agribusiness oriented educational material, e.g. cultivation techniques and iii) e-services ranging from weather and epidemic alerts to new product development. These well established practices, needs and requirements where also verified from rural youth as well as involved stakeholders from a diverse professional background by evidence found for their intentions, on using such mediums.

Our proposal includes the construction of an online platform and accompanying mobile applications to facilitate e-commerce, retail and bulk sales and purchases as well as possible auctioning options. Furthermore for the portal framework we propose modules for agricultural news, forums, blogs, cultivation techniques or agricultural in general educational material as well as weather forecast and localized alerts per user. In our proposal we also include commodities pricing update and e-services, i.e., logistics, legislation news, social media, digital marketing options, accompanying help videos and tutorial. A fully developed service model with all the involved entities and their interactions, on which the platform or mobile application can be built, is included as well as draft designs for both.

Συνοπτική παρουσίαση

Στόχος της παρούσης μελέτης ήταν η ανάλυση των αναγκών και των απαιτήσεων των εμπλεκομένων στον ευρύτερο τομέα της γεωργίας για ηλεκτρονικό εμπόριο, ψηφιακό μάρκετινγκ, διαδικτυακές υπηρεσίες αλλά και η αναγνώριση των βέλτιστων πρακτικών που έχουν ακολουθηθεί σε υπάρχουσες λύσεις, σε εθνικό αλλά και διεθνές επίπεδο. Η μεθοδολογία μας περιλαμβάνει επισκόπηση διαφόρων τύπων ιστοτόπων και εφαρμογών για φορητές συσκευές, βιβλιογραφική έρευνα, ερωτηματολόγια, συνεντεύξεις, ομάδες εργασίες αλλά και κατασκευή προσχεδίων και μοντέλων λειτουργίας.

Για την επισκόπηση των υπαρχουσών λύσεων, εξετάσαμε πενήντα ιστοτόπους όπου εφαρμόσαμε σαράντα κριτήρια, είκοσι δυο εφαρμογές για φορητές συσκευές όπου εφαρμόσαμε είκοσι δυο κριτήρια και τα ποσοτικά στοιχεία που πρόεκυψαν από την ανάλυση της εφαρμογής τους συνδυάστηκαν με τα ποιοτικά από τη χρήση τους.

Η βιβλιογραφική έρευνα κάλυψε περισσότερα από τριάντα άρθρα από περιοδικά με κριτές, συνέδρια και κρατικές αναφορές και περαιτέρω συλλέξαμε ερωτηματολόγια από εκατόν δέκα φοιτητές αλλά και διεξήχθησαν δεκαοκτώ συνεντεύξεις και δυο ομάδες εργασίες με τριάντα δυο συμμετέχοντες.

Το κυρίαρχο εύρημα της έρευνας μας είναι η διαπίστωση της ανάγκης αλλά και της πρόθεσης χρήσης από τα εμπλεκόμενα μέρη για εργαλεία βασιζόμενα σε τεχνολογίες του διαδικτύου, που θα στηρίζονται στο πληροφοριακό μοντέλο και θα παρέχουν επιλογές για ηλεκτρονικό εμπόριο, ψηφιακό μάρκετινγκ, νεα και τεχνικές για τη γεωργία αλλά και επιλογές για παροχή ψηφιακών υπηρεσιών.

Στη πρόταση μας περιλαμβάνεται η κατασκευή διαδικτυακής πλατφόρμας και εφαρμογών για φορητές συσκευές, με δυνατότητες ηλεκτρονικού εμπορίου για λιανική και χονδρική, αγορές, πωλήσεις με δυνητική επέκταση σε δημοπρασίες. Για την ενημερωτική πύλη, προτείνουμε αρθρωτές μονάδες με νέα για την γεωργία,
ιστολόγια, φόρουμ, καλλιεργητικές τεχνικές και ανάλογου υλικού για όλους τους τομείς, πρόβλεψη καιρού με εξατομικευμένες ειδοποιήσεις και ενημέρωση για τιμές αγροτικών αγαθών.

Στις υπηρεσίες προτείνουμε δυνατότητες επιμελητείας, νέα για τη νομοθεσία, εργαλεία κοινωνικής δικτύωσης και ψηφιακού μάρκετινγκ και τέλος συνοδευτικό εκπαιδευτικό υλικό. Παραθέτουμε ένα πλήρως ανεπτυγμένο μοντέλο για όλες τις εμπλεκόμενες οντότητες και την αλληλεπίδραση τους, με βάση το οποίο μπορεί να κατασκευαστεί η πλατφόρμα και οι εφαρμογές αλλά και προσχέδια.

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List of Abbreviations

WCAG	Web Content Accessibility Guidelines
W3C	World Wide Web Consortium
SEO	Search Engine Optimization
PHP	Hypertext Preprocessor
iOS	iPhone Operating System
URL	Uniform Resource Locator
PPC	Pay Per Click
QR	Quick Response (Code)
SMS	Short Message Service
IIS	Internet Information Server
CMS	Content Management System,
ASP	Active Server Pages
ICT	Information and Communication Technologies
IT	Information Technologies

1. Introduction

Agribusinesses can save and earn more money by harnessing e-commerce and m-commerce technologies for their marketing success, versatility of offered services and products as well as cost reduction capabilities. The main objective of this study is the design of an online platform for supporting start-up agribusinesses of all agricultural fields in their b2c and b2b e-commerce activities based on the one-stop shop concept.

To design such a tool, we analyzed the requirements and needs of agribusinesses for e-trading and e-marketing, identified e-services that could be provided and reviewed best practices in e-commerce solutions and mobile applications development, that have already been successfully used on a national or an international level. Our methodology includes review of online platforms and mobile applications, extensive literature research, structured questionnaires, interviews and focus groups with involved stakeholders.

In chapter two we present our findings for fifty agribusiness oriented sites displaying a broad variety of features, i.e., e-marketplaces, e-trading, auctioning, agricultural portals etc. Our methodology approach includes: i) the models and categories for the evolved parties and functionality they offer, i.e., b2b, b2c, brokerage model etc., ii) the features approach for issues related to users, education and revenue, i.e., advertisement options, blogging, members section etc. and iii) a multiple criteria list which spans e-marketing, technological and usability issues i.e., locale, profile, social media integration etc. In total we applied forty criteria, analyzed the statistical results and combined them with our empirical approach to obtain both quantitative and qualitative results.

Our findings from our review of twenty two mobile applications are presented in chapter three and our methodology includes: i) the models and features approach for b2b, b2c, evolved parties and advertisement options and ii) the mobile platform features approach which examines technological, popularity and rating issues, i.e., platform support, ratings, downloads, reviews and company profile information. In total we applied twenty one criteria, analyzed the statistical results and combined them with our results from hands on usage.

In chapter four our literature review includes extensive analysis of thirty articles from peer reviewed journals, white papers, conferences etc., from both Greek and

international sources. Due to the technological dimension of our report we examined agribusiness, agricultural products and services as well as case studies found on ICT and business oriented journals. We include a comprehensive table per keyword and categories with multiple keywords being used, i.e., electronic trade platform case studies, e-marketplace adoption, e-commerce, etc.

Chapter five includes our findings from questionnaires which were handed out to one hundred and ten students encompassing two B.Sc. pathways, that of precision agriculture and food science and five HNC pathways that of animal management, biological sciences, travel and tourism management, horticulture and business. This target group offer a multitude of valuable characteristics: i) the geographical distribution and rural origin of the students, ii) their hands on experience from real life farming environments and understanding of local practices, iii) their knowledge of rural communities acquaintance with technology and iv) their current field of studies which tie naturally with the goal of this research, since youth entrepreneurship in agribusiness is the main aim of this proposal.

Furthermore in the same chapter we present our results from thirteen interviews and two focus groups with involved stakeholders, the first one with twenty three participants and the second nine, from which we gathered both qualitative and quantitative data. The participant's professional skills covered a broad agribusiness range, i.e., farmers, beekeeping, olive oil standardization, cow breeding, food science technologists, agro tourism and platform designers.

In the last chapter, the requirements and needs that came forth from our research are combined to a design that supports information, promotion and online trading in one single point of access and includes: i) e-market with b2c and b2b options for the connection of buyers and sellers, ii) digital marketing tools, iii) informative agrinews portal and iv) integration of services by third parties. Furthermore for our proposal we include drafts and a thorough analysis of the involved entities and their functionality , for the modular software design displayed.

2. Online platforms review

2.1. Methodology

In order to identify best practices in e-markets, e-commerce solutions and online platform development that have already been used, on a national or an international level, we reviewed fifty platforms displaying a broad variety of features

, i.e., e-marketplaces, e-trading, auctioning, bidding, business-to-business and business-to-consumer options, agricultural portals etc.

The selection of the platforms orientation was a core issue of the purpose of the study and we covered both well established as well as up and coming ones, since youth entrepreneurship and startup agribusiness is the aim of this research. Our methodology includes three approaches, each tackling a different aspect: i) the models and categories approach which examines the evolved parties and provided functionality, ii) the features approach which pinpoints distinct platform features, i.e., e-trading, e-services etc., and iii) a criteria list which we devised and covers a multitude of aspects including locale, profile, social media etc.

In the following sections, we present each approach by describing its general setting followed by justification for each method, category and criteria applied by briefly displaying its utility. After each explanatory part, tables are displayed with the results of the application and a summary of findings from all sections along with our empirical approach are presented in chapter 2.5.

2.2. Models and categorization

The taxonomy of electronic business models is based on either the entities evolved or the functionality they offer; we used both approaches and based on the functionalities they offer, the categorization of e-business models we applied was the following:

- Brokerage model: It facilitates transactions between buyers and sellers and it is common practice for a broker to charge a fee or commission, for each transaction it enables.
- Advertising model: This model is based around payments for advertisements as revenue sources, which are usually aimed to relevant target groups.
- Infomediary model: It is based on gathering and sharing of information by providing focused information on behalf of producers, for goods, services and their potential customers.
- Merchant model: The merchant model is used by online wholesalers and retailers of goods and services.
- Manufacturer (direct) model: The manufacturer model is predicated on web technologies which allow the manufacturer to reach buyers directly and thereby compress the distribution channel.
- Affiliate model: It generates revenue based on sales of products and services without managing order and inventories, by processing payments, handling packaging and shipping, since the website redirects users to brokerage or merchant model websites.
- Community model: It is based on users joining and participating around a common purpose, were they create and share content with others through electronic tools like forums and chat rooms.
- Subscription model: It is based on the notion of offering services based on a periodically charged fee and it is common to provide a free membership with time or access restrictions; in order to unlock certain features or continue using the platform, a paid membership plan is needed.
- Utility model: It is based on a metering usage or a "pay as you go" approach and unlike subscriber services, metered services are based on actual usage rates.

Based on the involved entities, the categorization of the e-business models we applied was the following:

- Business - to - Business (B2B): The entities involved are companies which sell and buy products and services online.
- Business - to - Consumer (B2C): In this model a business sells directly to individual consumers.
- Consumer - to - Consumer (C2C) : In this model a website provides services that link consumers to one another.
- Consumer - to - Business (C2B): In this model customers set the price for products as part of the bargaining deal.
- Business - to - Government (B2G): In this model services and products are offered from companies to the public sector.
- Government - to - Business (G2B): In this model government offers services to businesses.
- Government - to - Citizen (G2C): In this model government is offers services to citizens.

In the following two tables, we display the results of our review for the model and functions approach and their analysis will be presented in chapter 2.5. along with the results, from other parts of this section. The id numbering displayed in tables 2.2.A and 2.2.B. will be used through the rest of the online platforms review, to save space and avoid repetition.

id	Platform URL	Type	Model
1	http://www.agrohunter.gr/	B2B, B2C	Subscription
2	http://www.farminc.eu/	B2B	Infomediary, Manufacturer
3	http://www.mermix.gr/	B2B, B2C	Brokerage
4	https://agrotisa.wordpress.com/	B2C	Advertising
5	https://www.c-gaia.gr/etaireia	B2B	Infomediary, Manufacturer
6	https://youpick.gr/	B2B	Manufacturer
7	http://deanatura.com.gr/	B2B, B2C	Manufacturer
8	http://tecbs.gr/index.php/el/nea/diktiaki-platforma-core-tdm/104	B2B	Brokerage
9	http://www.topagrodeals.com/	B2B	Manufacturer
10	http://www.agrelma.com/	B2B	Brokerage, Advertising
11	http://www.agriaffaires.com/	B2B	Brokerage, Advertising
12	http://www.agroterra.co.uk/	B2B	Brokerage, Merchant
13	http://www.agrotrade.net	B2B	Brokerage, Advertising
14	http://e-services.minagric.gr/greekfood/	B2B, B2C	Advertising
15	http://www.farms.com/	B2B, B2C	Infomediary, Community
16	http://www.localharvest.org/	B2B, B2C	Brokerage, Community, Advertising
17	http://www.pandabobo.com	B2B, B2C	Brokerage, Advertising
18	http://www.vegetables1.com/	B2B, B2C	Advertising, Subscription
19	http://www.commodities.gr/el	B2C	Brokerage
20	http://www.agrotypos.gr/	B2B	Infomediary, Brokerage, Advertising
21	http://www.agro-bazaar.gr/	B2C	Advertising
22	http://greenhousebio.gr/	B2C	Merchant
23	http://www.zouridakis.gr/	B2C	Merchant
24	http://www.laikesagores.gr/	B2C	Infomediary
25	http://agroticacenter.gr/	B2C, B2B	Advertising
26	http://www.farmadeals.com/	B2C, B2B	Brokerage, Advertising

Table 2.2.A. Results for type and model approach to platforms one to twenty six

id	Platform URL	Type	Model
27	http://www.agrodata.gr/	B2B	Brokerage, Advertising
28	https://www.fginsight.com/	B2B	Infomediary, Advertising
29	http://www.efresh.com/	B2B	Brokerage, Advertising
30	http://www.agricart.com/	B2C	Merchant
31	http://sagefarmersmarket.org.au/	B2C	Merchant
32	http://agromerchant.com/	B2C	Merchant
33	http://www.greek-e-foodmarket.com/	B2C, B2B	Merchant
34	http://www.farmacert.com/	B2B	Manufacturer (Direct)
35	http://www.defermetisten.be/	B2C	Merchant
36	http://www.siniparxi.gr/	B2C	Merchant
37	http://www.local2local.nl/	B2C	Merchant, Advertising
38	http://www.abelandcole.co.uk/	B2C	Merchant
39	http://stowag.com/	B2B, B2C	Merchant, Advertising
40	https://www.farmlands.co.nz	B2B, B2C	Merchant, Advertising
41	http://www.greekfruits.gr/	B2B	Manufacturer
42	http://www.topagrodeals.net/	B2C	Brokerage, Advertising
43	http://www.foodmarket.gr/fm/	B2C	Brokerage, Advertising
44	http://www.marxfoods.com/	B2B, B2C	Merchant, Advertising
45	http://www.eatcrete.com/	B2C	Manufacturer
46	http://www.agriscape.com/	B2C, B2B	Infomediary
47	http://eng.foodchina.com/	B2B	Brokerage, Advertising Modl
48	http://www.cmegroup.com/trading/agricultural/	B2B	Infomediary
49	http://www.avatrade.com/trading-info/range-of-markets/agriculture	B2B, B2C	Infomediary, Manufacturer
50	http://www.agricharts.com/index.php	B2B	Infomediary, Manufacturer

Table 2.2.B. Results for type and model approach to platforms twenty seven to fifty

2.3. Features approach

The second approach to our review was to check the following features:

- Members Section: We checked if a member section was available, which enables customization of the perceived information and greatly enhances usability.
- e-shop and special offers: We checked for special offers option within the e-shop , which attracts customers and enhances B2C.
- e-Auction : We checked for the availability of an online live auctioning system.
- Commodities prices: We checked if a live information about prices was available.
- List of involved entities: We checked for a directory of involved parties.
- Ads and job ads: We checked if the users could place advertisements in various lists for products or for carrier opportunities.
- Banners advertisement: We checked for the option to advertise to the site banners.
- News / Blog: We checked for an integrated blog segment, which provides community support, experts opinion and facilitates user feedback/
- Events Calendar: We checked for online calendar availability to users and third parties.
- Educational material: We checked if information for best practices, cultivation, case studies and related agriculture material was offered.
- Forum: We checked if there was an integrated forum to facilitate user dialog.
- Help Videos : We checked if tutorial videos were offered, which greatly helps many rural and older aged users who are not acquainted with technology.
- Newsletter: We checked if users can subscribe to a newsletter, since it's a strong corporate tool for fast and easy cost control, which enhances the company profile and can be personalized or group oriented.
- Useful links: We checked if there was a separate section with links for useful articles, i.e., cultivation and agriculture techniques, legislation news.
- Weather forecast : We checked for the availability of generalized and localized per user weather information and forecast .

In the following two tables we display the results of our review for the features approach and the findings of this section will be presented in chapter 2.5. , along with the results from the other aspects of the review.

Id	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Members Section	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
e-shop	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	No	No
Special Offers	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes	No	No	No	No	Yes	No	No	Yes	No	Yes	Yes	No	No
e-Auction	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	No	No
Commodities prices	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No	No	No	No
List of involved entities	No	Yes	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No
Ads	No	No	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	Yes
Job ads	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No
Banners Advertisement	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No
News / Blog	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
Events Calendar	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	No	No
Education material	No	No	No	No	Yes	No	No	No	No	No	No	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	No	No	Yes
Forum	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	No	No
Help Videos	No	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	Yes	No
Newsletter	Yes	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	No	No	Yes
Useful Links	Yes	No	Yes	No	Yes	No	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	No
Weather forecast	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	Yes	No	No	No	Yes	No

Table 2.3.A. Results for feature approach to platforms one to twenty five

id	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Members Section	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
e-Shop	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No
Special Offers	No	No	No	Yes	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	No
e-Auction	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	Yes	No	No	No
Commodities prices	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes
List of involved entities	Yes	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
Ads	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No
Job ads	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Banners Advertisement	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No	Yes	No	No	Yes	No	No	Yes	No	Yes	Yes	No	No	No	No
News / Blog	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Events Calendar	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	No	Yes	No
Education material	No	No	Yes	No	No	Yes	No	No	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No	Yes	No	Yes	Yes	Yes
Forum	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Help Videos	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	No	No
Newsletter	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No	No	Yes
Useful Links	No	No	Yes	Yes	No	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Weather forecast	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	Yes	No	No	No	No

Table 2.3.B. Results for feature approach to platforms twenty six to fifty

2.4. Criteria list

In order to supplement our empirical approach with technical and quantified data, we applied a list of criteria which encompasses a wide range of features and in this section we list the ones used, the categories they can be inducted in and the justification for their application. We present our findings in tables 2.4.A up to 2.4.E, along with their analysis and their synergies with other results from this section.

Category A. Platform profile

- Name and functionality: The main functionality of the site, that is the main activities and features it offers and basic info as name and URL.
- Renewability: How often the web page is updated and if it is at least once per week for the last two months, we consider it as renewable.
- Country: The country on which the company owning the platform is based.
- Structure/sitemap: We checked if a sitemap is offered, which provides easiness of use, faster and better crawling for search engines resulting in higher SEO ranking. The platform structure is closely tied to this feature and we checked if it was easy to navigate, with no misleading or hard to make out categories.
- Mobile applications: We checked if there is an accompanying to the site mobile application.
- Website traffic : We used http://www.similarweb.com/ , to check unique visits per month

Category B. Validation and metrics

- W3C validation: We checked conformance to World Wide Web Consortium web standards http://validator.w3.org/ , which is a set of rules of good practice in programming. The W3C verification provides multiple advantages: i) easy access from a variety of different devices, ii) cross browser compatibility, iii) easy maintenance due to the support of the online community and iv) smooth developer transition. Furthermore SEO wise web spiders operate and seek known programming practices for their indexing, which may result to partially index or even remove one, due to errors encountered.
- Accessibility: We checked for WCAG 2.0 and Section 508 accessibility standards, which are proposed by the W3C consortium and refer to the usage of web pages by people with various physical difficulties. They aim to make: i) pages perceivable, i.e., provide text alternatives for non-text content, captions, ii)

easier operable, i.e., allow all functionality from keyboard etc. , iii) understandable, i.e., make content appearance and iv) operate in a predictable and robust way, that is able to deal with issues of current and future compatibility.

- Search engine: We checked if an incorporated search engine is offered which greatly enhances user experience by allowing them to easier relevant data.
- First known record: We used https://archive.org and platform data to determine the age of the platform and while this feature is many times overlooked, it offers many advantages :

  Better name selection due to availability, which in turn also prevents competitors from obtainining an easy to remember address.

  SEO impact due to the credibility attached to longed standing names, since they been crawled in depth multiple times by major search engines.

  New sites have not been tested and may be spam sites or have not trustworthy content wise, thus get a lower ranking and 301 redirects which may result in SEO loss.

Category C. Technological aspects

- Current web technologies: We used http://builtwith.com/ , to check the web technologies used to develop the backend, frontend and other add ons, in order to formulate a complete view of the current status of technologies used by the developers, of online agribusiness oriented websites.
- Dynamic / Static : We used http://builtwith.com/ , to check the platform type and current Web 2.0 oriented sites encourage users to enhance the content, which leads to great meta value and customization options.
- Responsive design: We used www.responsinator.com , to check whether the site is responsive or not, that is if the pages adjust their size, content and functionality to different resolutions and devices. Its importance is constantly increasing, due the continuing rise of mobile device oriented b2b and b2c, especially when there isn't a supplementary mobile application available.

Category D. Social media networking and customer feedback

- Facebook page

  Profile : We checked if the platform / company has a Facebook profile

  Integration : We checked if the platform / company's Facebook profile is integrated to the site

  Renewability : We checked how often the Facebook profile is updated and if it is at least once per week for the last two months, we consider it as a renewed profile

  Number of likes : We checked the number of likes on the platform / company's Facebook profile
- Twitter account : We checked if the platform / company has a twitter account and how many follow it
- YouTube account : We checked if the platform has a YouTube account and if it is used
- Other platforms: We checked if another platform was also used, i.e., Pinterest, Google Plus etc.
- Contact forms: We checked if the site offers an online contact form, which facilitates control on gathering of information, easy and immediate use and automatization, allowing for easy statistical analysis and less handling of wrongly inputted data.
- Languages : We checked the languages the platform supports

In the following table we display the results of the application of the aforementioned criteria to the sites we reviewed, with each table covering ten platforms.

Category A. Platform profile	Name (id#)	1	2	3	4	5	6	7	8	9	10
	Functionality	b2b, product search , subscription offered	Education material for brand building and marketing	Portal , mediates between owners of machinery and potential renters	b2c	Informative portal for agricultural news	Promotion and marketing services for producers	b2b , mediates between Greek producer and EU importers	b2b and b2c platform for online agro tourism reservations	Consulting services for exporters	online catalog
	Renewability	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
	Country	Greece	EU project	Greece	Greece	Greece	Greece	Greece	Greece	Greece	Italy
	Structure/sitemap	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
	Mobile application	No	No	No	No	No	No	No	No	No	No
	Website traffic (monthly)	500	500	1000	1000	5000	N/A	100	N/A	100	4.000
Category B. Validation and metrics	W3C validation (Errors, Warnings)	164,262	2,0	45,9	61,6	14 , 4	2 ,3	31,3	24,6	5,2	16,5
	Accessibility (% pages with accessibility problems)	30%	10%	10%	70%	40%	X	90%	40%	11%	27%
	Incorporated search engine	No	No	Yes	No	Yes	No	Yes	No	No	Yes
	First known record	2014	2013	2014	2011	2013	2011	2014	2014	2015	2001
Category C Technological aspects	Current web technologies	ASP.NET , IIS	PHP	Drupal	PHP, Wordpress	Joomla, PHP	PHP, Wordpress	ASP.NET , IIS	Joomla, PHP	ngix server	Custom CMS ASP.NET
	Dynamic / Static	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Static	Dynamic	Dynamic	Dynamic	Dynamic
	Responsive Design	No	No	Yes	No	No	Yes	No	Yes	No	No
Category D. Social media networking and customer feedback .	Facebook page	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes
	Facebook page integration	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
	Facebook page renewability	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No
	Facebook page likes	1.3 k	266	14	No	2699	No	539	185	227	669
	Twitter (followers)	826	73	14	No	No	No	No	1	3	321
	YouTube	No	No	No	No	Yes	No	No	No	No	No
	Other	LinkedIn 9 followers	No	No	No	LinkedIn 56 followers	No	LinkedIn link but inactive	Google+ Plus	No	No
	Contact forms	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes
	Languages	GR, EN	EN	GR	GR	GR	GR	GR, EN	GR, EN , FR	GR, EN	GR, EN

Table 2.4.A. Results from criteria approach to platforms one to ten

	Name (id#)	11	12	13	14	15	16	17	18	19	20
Category A. Platform profile	Functionality	online catalog for farm equipment products/ and farm machinery	e-marketplace	e-marketplace	b2b online catalog for korean products	online list of greek producers powered by greek Ministry of Rural Development and Food	Agri news portal with ads section	online catalog, b2c marketplace	e-marketplace for china agricultural products	online catalog for suppliers and products	online catalog for requests and offers
	Renewability	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
	Country	France	Spain	Spain	Korea	Greece	USA	USA	China	Netherlands	Greece
	Structure/sitemap	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	Mobile application	Yes	No	No	No	No	No	No	No	No	No
	Website traffic (monthly)	1.100.000	320.000	320.000	3.000	40.000	45.000	190.000	N/A	1.000	5.000
Category B. Validation and metrics	W3C validation (Errors, Warnings)	140, 23	192 , 201	192 , 201	258 , 115	1	116 , 90	90 , 47	126	3	57, 28
	Accessibility (% pages with accessibility problems)	45%	72%	72%	81%	27%	54%	54%	54%	63%	72%
	Incorporated search engine	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	First known record	2000	2000	2000	2000	2012	1998	2000	2009	2008	2011
Category C Technological aspects	Current web technologies	Custom CMS ASP.NET	Magento	Magento	Custom CMS ,JSP	Custom CSM ASP.NET	Custom CMS ASP.NET	Custom CMS JSP	custom CMS PHP	custom CMS PHP	custom CMS PHP
	Dynamic / Static	Dynamic	Dynamic	Dynamic	Dynamic	Static	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic
	Responsive Design	No	No	No	No	No	No	No	No	No	No
Category D. Social media networking and customer feedback	Facebook page	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No
	Facebook page integration	No	No	No	No	No	No	No	No	No	No
	Facebook page renewability	Yes	Yes	Yes	No	No	Yes	Yes	No	No	No
	Facebook page likes	8110	3.145	3.145	No	No	1.001	113.644	No	No	No
	Twitter (followers)	1063	12.000	12.000	No	No	46.900	26.600	No	No	No
	YouTube	No	No	No	No	No	Yes	-	No	No	No
	Other	Google+ 228 followers	No	No	No	No	No	No	No	No	No
	Contact forms	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	Languages	FR, EN, DE, IT, ES, NO, RO, PT, PL, CS, SV, RU	ES, EN, DE	EN, KO, JA, CN, FR, ES, AR, DE, RU, TH, VN	GR	EN	EN	CN	EN	GR, EN, DE, FR	GR,EN

Table 2.4.B. Results from criteria approach to platforms eleven to twenty

Category A. Platform profile	Name (id#)	21	22	23	24	25	26	27	28	29	30
	Functionality	agri news portal classified ads	b2c, ads, online catalog,	b2c	b2c	b2c, b2b	partial b2c functionality, elementary b2b funcionality	b2c, catalog, b2b	b2b, online catalog	online catalog, user registeratio n, ads	b2b, online consultin g
	Renewability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Country	Greece	GR	GR	GR	GR	GR	GR	GR	UK	India
	Structure/sitemap	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
	Mobile application	Yes	No	No	Yes	No	No	No	No	Yes	No
	Website traffic (monthly)	110.000	2.000	10.000	2.000	7.000	2.000	2.000	15.000	20.000	N/A
Category B. Validation and metrics	W3C validation (Errors, Warnings)	166,146	Validated	34,27	33 9	118,17	15,15	45,0	88,17	7,1	8,3
	Accessibility (% pages with accessibility problems)	63%	70%	0%	10%	90%	100%	90%	90%	20%	70%
	Incorporated search engine	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
	First known record	2000	2011	2012	2001	2008	2014	2012	2011	2015	2000
Category C Technological aspects	Current web technologies	ASP.NET	nginx, Joomla	Apache PrestaShop	nginx PrestaSh op	Apache , PHP	Apache,Wordpress	Apache,Wordpr ess	Apache , PHP	Apache, Amazon	Apache , Drupal
	Dynamic / Static	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic
	Responsive Design	No	No	No	Yes	No	Yes	No	No	Yes	Yes
Category D. Social media networking and customer feedback	Facebook page	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
	Facebook page integration	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
	Facebook page renewability	Yes	No	Yes	Yes	No	Last update November 2014	Yes	Last update January 2013	Yes	No
	Facebook page likes	6975	No	4,452	10,114	No	2,294	6,894	2,329	157	No
	Twitter (followers)	210	No	No	368	No	Link to twitter site	377	Link there but inactive	300	No
	YouTube	No	No	No	Last update 2 years ago	No	No	No	No	No	No
	Other	retweet / +1 at Google+	No	LinkedIn 4 connections	No	No	LinkedIn10 connections	No	Google plus+ - 22 followers	No	Google+
	Contact forms	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
	Languages	GR	GR	GR,EN,CH, RU	GR	GR	EN,GR	EN, GR	EN	EN	EN

Table 2.4.C. Results from criteria approach to platforms twenty one to thirty

Category A. Platform profile	Name (id#)	31	32	33	34	35	36	37	38	39	40
	Functionality	b2c with online cart	b2c	b2c, partial b2b, registered users	farm management software platform	catalog, b2c , b2b	e-shop , b2c and b2b, organic products	b2c , b2b	b2c, b2b	Machinery and production related b2c and b2b	Cooperative catalog for products, auctions etc.
	Renewability	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Country	India	Nigeria	GR	GR	NL	GR	NL	UK	UK	New Zealand
	Structure/sitemap	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	Mobile application	No	No	No	Yes	No	No	No	No	No	Yes
	Website traffic (monthly)	500	No	2.000	N/A	N / A	3.000	N / A	150.000	1.000	20.000
Category B. Validation and metrics	W3C validation (Errors, Warnings)	3,2	4,16	126,30	13,3	7, 1	31, 3	3, 1	14, 1	14, 8	84 , 7
	Accessibility (% pages with accessibility problems)	0%	0%	90%	70%	70%	90%	90%	78%	60%	80%
	Incorporated search engine	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
	First known record	2013	2011	2013	2014	2015	2012	2015	2002	2013	1998
Category C Technological aspects	Current web technologies	Nginx, PHP	Apache ,Wordpres	Apache , PHP	Apache , PHP	nginx , Wordpress	nginx , Wordpress	Apache	ASP.Net	Apache , PHP	IIS with ASP.NET
	Dynamic / Static	Dynamic	Dynamic	Dynamic	Static	Dynamic	Dynamic	Yes	Dynamic	Dynamic	Dynamic
	Responsive Design	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes
Category D. Social media networking and customer feedback	Facebook page	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
	Facebook page integration	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes
	Facebook page renewability	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
	Facebook page likes	4,762	66	1,152	No	3,204	3,832	517	53,923	No	30,415
	Twitter (followers)	55	39	121	No	Inactive link	Yes for URL	281	19,8	No	No
	YouTube	No	No	Has one but no uploads	No	No	No	No	Yes	No	No
	Other										
	Contact forms	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Languages	EN	EN	GR,EN,GE	GR	NL	GR	NL	EN	EN	EN

Table 2.4.D. Results from criteria approach to platforms thirty to forty

	Name (id#)	41	42	43	44	45	46	47	48	49	50
Category A. Platform profile	Functionality	Informative for greek fruit exporters	b2c, b2b	Catalog and product placement	b2c, b2b	Informative and catalog for products originatio n from Crete	online catalog / directory and buy / sell options with ads	b2b e-marketplace	bulletin, commodities prices, statistical tools	Commodities trading, desktop and mobile applications	web and mobile website hosting, mobile content and tools, market data, web services APIs
	Renewability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Country	GR	GR	GR	UK	GR	US	China	US	Irelaand	US
	Structure/sitemap	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Mobile application	No	No	No	No	No	No	No	No	Yes	Yes
	Website traffic (monthly)	N/A	1.000	5.000	25.000	500	20.000	N/A	1.400.000	190.000	7.000
Category B. Validation and metrics	W3C validation (Errors, Warnings)	147,80	10 ,2	756,244	81,10	59,4	2,1	19,18	109,44	32,2	34,2
	Accessibility (% pages with accessibility problems)	1%	60	67%	20%	80%	20%	100%	50%	20%	100%
	Incorporated search engine	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
	First known record	2001	2013	2013	2007	2010	2000	2001	2010	2013	2010
Category C Technological aspects	Current web technologies	N/A	Apache, PHP	Apache, PHP , Wordpress	Apache, NetSuite	Apache, Joomla	Apache	ASP.NET	Taleo, Chango	ASP.NET , Newrelic	PHP
	Dynamic / Static	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic	Dynamic
	Responsive Design	Yes	No	Yes	Yes	No	No	No	No	No	Yes
Category D. Social media networking and customer feedback	Facebook page	No	Inactive	Yes	Yes	Yes	No	No	Yes	Yes	No
	Facebook page integration	No	No	Yes	Yes	Yes	No	No	Yes	Yes	No
	Facebook page renewability	No	No	Yes	Yes	Yes			30,974	49.247	
	Facebook page likes	No	No	2,097	12,82	7,556	No	No	769.000	7.088	No
	Twitter (followers)	No	Inactive	60	1438	261	No	No	Yes	Yes	No
	YouTube	No	No	No	Last update one year ago	No	Linkedin but inactive	No	Google+, pinterest, Linkedin, Instagram	Google+	No
	Other										
	Contact forms	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	Languages	GR	GR, EN	GR	EN	GR, EN	EN, CH, FR , SP	EN	EN, FR, DE , IT, SP, CH	EN, FR, DE , IT, SP, CH,SV	EN

Table 2.4.E. Results from criteria approach to platforms forty one to fifty

2.5. Online platforms review results

In this section we present our findings for the online platforms review, which include: i) the statistical results and their analysis from the model approach and type analysis, ii) the features approach findings, iii) the criteria list results and iv) our empirical approach.

Our first finding from the type approach, is that thirty six percent offers b2b options, thirty percent offers b2c and thirty percent offers both; this can be attributed to the fact that auctions and bulk e-trade, are the main functions of an e-marketplace. Regarding the models approach on the following table we gathered and ordered by percentage and combinations our results:

Model	Percentage	Models	Percentage	Model	Percentage
Advertising	46%	Advertising and Brokerage	10%	Advertising and Infomediary and Brokerage	2%
Brokerage	42%	Advertising and Infomediary	10%		
Infomediary	19%	Advertising and Subscription	2%		
Manufacturer	19%	Infomediary and Manufacturer	4%	Advertising and Brokerage and Community	2%
Merchant	12%	Infomediary and Community	2%		
Community	8%	Advertising and Brokerage	2%		
Subscription	8%	Merchant and Brokerage	2%		

Table 2.5.A. Findings from model approach

The dominant models found are those of advertising and brokerage, which shows that most platforms revenues evolve around brokerage services and advertisments that offer transactions and ad fees respectively, in contrast to the subscription aspect encountered only at eight percent of the cases. Furthermore while infomediary model is not as often used in comparison with the fore mentioned, its combination with advertising is encountered as often as advertising and brokerage, that is advertisements displayed are as important as general agricultural information. This is further strengthened by the fact that other combinations of two or three models display very low percentages and while manufacture and merchant percents are noteworthy, there is a clear indication of the business model orientation especially if we take into account the low percentages of the community and the subscription models.

Regarding the mobile aspect of the platforms we found that sixteen percent has an accompanying mobile application, eighteen percent of the platforms is W3C validated (up to 25 errors) and thirty eight percent are responsive, thus another finding is that there is a lack of investment on accompanying mobile applications. Development of a mobile application is costly and lower percentages were expected but given the responsiveness and W3C validation low percentages, we believe a significant market opportunity arises, since there is great interest in developing these tools for mobile viewing and usage, but mediocre effort was found. In the following table we present our findings regarding user orientated issues, social media platforms, and language and accessibility issues:

Platform structure and feedback						
Search engine		Clear structure / sitemap		Contact forms		
Yes	76%	Yes	88%	Yes	82%	
No	24%	No	12%	No	18%	
Social media						
Facebook page		Facebook page integration		Twitter		
Yes	66%	Yes	34%	Yes	50%	
No	34%	No	50%	No	50%	
Language and accessibility support						
One language				Two languages	Three or more	
CN	NL	GR	EN	GR,EN		
2%	4%	26%	30%	18%	20%	
Accessibility errors (% pages with accessibility problems)						
N/A	0-20%	21-50%	51-69%	70-79%	80-90%	100%
2%	24%	14%	16%	18%	20%	6%

Table 2.5.B. Findings for user orientated issues, social media , language and accessibility issues

Our findings from this approach are that most platforms have an integrated search engine, clear structure and that they invest on customer support with two thirds owning a facebook page, half a twitter profile and half of them integrate facebook to the platform. We also found a considerable lack of interest on accebility issues, since sixty percent of them have at least fifty percent problematic pages and only one out of five supports three or more languages.

On this issue we also found that from the thirteen Greek platforms we checked, nine or equivalently sixty nine percent also supported English; also for this category we encountered German, French, Check and Russian language, support which shows that Greek sites have an extrovert orientation.

At this point we present in the following table our findings, regarding the feature approach, the technological aspects and the age of the platforms:

Features								
Members Section	e-shop	Special Offers	e-Auction	Commodities prices	List of involved entities	Ads	Job ads	Banners Advertisement
84%	34%	34%	10%	14%	50%	44%	8%	40%
News / Blog	Events Calendar	Education material	Forum	Help Videos	Newsletter	Useful Links	Weather forecast	
62%	12%	32%	8%	16%	40%	46%	84%	
Age								
1998	2000	2001	2002	2013	2007	2008	2009	2010
4%	14%	8%	2%	2%	2%	4%	2%	10%
2011	2012	2013	2014	2015				
12%	8%	14%	10%	8%				
Current web technologies								
Apache Server	PHP	Drupal	CustomCMS	ASP.NET	nginx	IIS	Wordpress	JSP
36%	34%	4%	18%	22%	12%	6%	16%	4%
Joomla	PrestaShop	Magento	Other					
8%	4%	4%	1%					

Table 2.5.C. Findings for features, age and current web technologies

Our first finding from the features approach is that while eighty four of the platforms have a member section and user friendly related features like forums, other options like help videos, educational material, events calendar and newsletter are not met often. This finding shows that members section is mostly used for user authorization needed for e-commerce options available, but further customization or user friendly orientation is not present; also it is note worthy that special offers aspect seems neglected.

Furthermore we frequently encountered localized weather information, news and blog sections, thus users are highly interested in these features but not is the same degree as looking into general information from the useful links or involved entities section. An important finding from the age of the reviewed platforms, is that sixty percent of them have been implemented from 2010 and afterwards, which displays the current interest on developing such platforms. For technological aspects. the current web technologies findings point to the tuple of apache server technologies, PHP and ASP.NET; also we found several custom content management systems along with the well established Wordpress CMS. At this point we present the findings from our empirical approach of our review and all the finding will be combined with other parts of the report in chapter six.

We found platforms that facilitate online presence for the producers. that is they act as a personal site and offer limited options regarding user options; often elementary product information in a catalog format and producers contact details list (id#42), e.g., the Greek Pan-Hellenic association of Greek public markets(id#24). A variation of this model provides a bulletin and directory format for a multitude of categories i.e., agricultural supplies, dairy, fertilizers , fish and seafood , food and beverages, machinery and equipment, poultry and eggs etc. , with the option to put on sales advertisements for free (id#1) and we found a Greek based platform on this direction (id#26).

An extension of this type allows for promotion of products and marketing (id#11) or other solutions like banners advertisments encountered in a Greek platform (id#19). More specialized marketplaces for b2b cases offer subscription models to producers, that allow access to other platform options linking consumers directly to producers i.e., telephone services, customized feedback forms, and multimedia display (id#12). We found a Greek platform of this type (id#33) and some also extend to the direction of providing e-services like consulting and packaging (id#29) or a noteworthy implementation from Nigeria which emphasizes on mobile viewing (id#32).

A further enhanced version of this informative type towards e-commerce, supports e-shop, cart, wish lists and filters for price and quantity search functions (id#39). We found that well established ones offer excellent directories, with thirty thousand entries of small to medium family farms or agriculture cooperative lists and ongoing events (#16). More specialized on agricultural information platforms cover many subjects, i.e., livestock, cultivation techniques, legislation news, etc. and while they are based on the agrinews portal model they facilitate exchange of information between all involved parties from machinery producers to poultry installations (id#15). We also found excellent designed solutions that offer carrier advertisements options and function on a subscription model, with pricing reaching three hundred dollars per year per subscription (id #18).

E-commerce options are further extended by the addition of report oriented tools and databases for many commodities and mathematical statistical analysis options (id#3). On b2b auctioning we found for machinery auction, sell and rental broadening the original informative sector to an e-market and one featuring live commodities prices offered as separate part (id #28). Another variation moves into other aspects of

agribusiness like tutorial videos, free online newspaper and livestock information, which also has an accompanying mobile application (id #20).

We found more focused e-markets platforms for seafood sales with extensive information (id #44), vegetable products offering from seeds to machinery products (id #30) and fresh fruits markets available at local markets in Australia. This system functions on the basis that it isn't always online, but the user receives an email when the market opens, which has to do with the availability of products, thus ensuring that the products are fresh (id #31). More focused on agribusinees technolog we found platform offering web and mobile website hosting, content management tools, market data and web services APIs (id #50); also a Greek cloud based deployment focused on logistic, calendar and GIS services moves on the same direction (id #34).

Our review also included locale based search, more specifically we found e-marketplaces in Netherland where only members of associations are allowed to sell and promote their products as well as use other services like loans (id #40). Based on this model, but without the member restrictions we found platforms which have modern design and emphasize on social media promotion, newsletters, map plug-ins and comment options, aiming to further engage users (id #37); on this pattern there exist many numerous Greek approaches (id#21, id#25, id#27), with some providing online coupons and centralized points of delivery for discounts (id#35).

Chinese platforms are well established and cover all the fore mentioned functionalities with emphasis on auctions (id#47), b2c and also include comprehensive data on all aspects of the products i.e., date of production, ISO qualifications and rating systems (id#17). A Korean marketplace has extended presence being offered in eleven languages and supports consulting, personal web hosting services, online dedicated magazine and works closely with the corresponding Ministries (id#13); this governmental approach was also found in the Greek Ministry of Rural Development and Food, which offers a directory of one hundred and ten categories for Greek farmers, featuring basic contact information (id#14).

Lastly we found Greek platforms which cover most of the function fore mentioned ; but are more topic focused, i.e., biological products (#36), blog sections for user communication (#22), recipe section (id#43) and we also found Crete based ones either of informative nature for local products and their history (id#45).

3. Mobile applications review

3.1. Methodology

In order to identify best practices in e-markets, e-commerce solutions and online platform development that have already been used, on a national or an international level, we reviewed twenty two agribusiness oriented mobile applications, with a broad variety of features, i.e., e-marketplaces, e-trading, auctioning and bidding, business to business and business to consumer options, agriculture and agrinews portal etc.

The selection of the applications had as a starting point the ones offered by the online platforms we reviewed, though since most didn't have one we mainly checked independent solutions. Our methodology includes distinct approaches with each covering different aspect of the applications: i) the models and features where we examined b2b,b2c,evolved parties, advertisement options etc. and ii) the technological and commercial statistics which pinpoints distinct applications features regarding operating systems, rating, downloads, reviews and company profile information.

In the following sections, we present each approach by describing its general setting followed by justification for each method, category and criteria applied by briefly displaying their utility. After each explanatory part, tables are displayed with the results of the application and a summary of findings from all sections along with our empirical approach are presented in 3.4.

3.2. Models and features approach

Agribusiness oriented mobile applications can be roughly divided to three categories: i) the ones that adopt b2c models and offer options like product search, e-shop, map integration etc., ii) the ones that adopt b2b models, which offer auction, e-marketplace, bidding, live update of commodity prices and weather alerts and iii) the ones specialized on farm or livestock management. For this approach we examined the following features:

- Members Section: We checked if a members section was available, which enables customization of the perceived information greatly enhancing usability
- e-shop and special offers : We checked for special offers option within the e-shop . which attracts customers and enhances B2C
- e-Auction : We checked for the availability of an online live auctioning system

- Commodities prices: We checked if there was information about prices updated live or a bulletin format
- List of involved entities : We checked for a directory of involved parties
- Ads and job ads : We checked if advertisments options were offered used in various lists and if there was a carrier opportunities segment
- News / Blog : We checked for an integrated blog segment, which provides experts opinion and allows for user feedback
- Events Calendar : We checked for online calendar availability ,which can be used by both users and 3rd parties for upcoming events
- Educational material : We checked if information for best practices, cultivation, case studies and related agriculture material was offered
- Forum : We checked if there was an integrated forum to facilitate user dialog
- Help Videos : We checked if tutorial videos were offered, which greatly helps many rural and older aged users who are not acquainted with technology
- Maps integration: We checked if the application offers interactive maps linked to content and search options
- Farm management: We checked if the application allows for farm or livestock management options, i.e., mapping, plants and seeds information and growth statistics
- Weather forecast : We checked for availability of both generalized and localized per user weather information and forecast

In the following tables we display the results of our review, for the model and features approach and the findings of this section will be presented in chapter 3.4. along with other results of the review. The id numbering displayed in tables 3.2.A. and 3.2.B. will be used through the rest of mobile applications review to save space and avoid repetition.

#id	1	2	3	4	5	6	7	8	9	10	11
Name	DTN/PF - The progressive farmer	AgMobile	Sirrus	AgValley Cooperative	Agricom	cropNation	IPMPro	totheshelf	Agrivi	Agrian Mobile	iFarma
Members Section	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
e-Shop	No	Yes	No	No	Yes	No	No	No	No	No	No
e-Auction	No	No	No	Yes	No	No	No	No	No	No	No
Commodities prices	Yes	Yes	No	Yes	No	Yes	No	No	No	No	No
List of involved entities	No	No	No	No	No	No	No	Yes	No	No	No
Ads	Yes	Yes	No	No	No	Yes	No	Yes	No	Yes	No
Job ads	No	No	No	No	No	No	No	No	No	No	No
News	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes	No
Events Calendar	No	No	No	No	No	No	Yes	No	No	No	Yes
Education material	Yes	Yes	No	No	No	No	No	No	Yes	No	No
Forum	No	No	No	No	No	No	No	No	No	No	No
Help Videos	Yes	No	No	No	No	No	No	No	No	No	No
Maps Integration	Yes	Yes	Yes	No	No	Yes	No	Yes	No	No	Yes
Farm managment	No	No	Yes	No	No	No	No	No	Yes	Yes	Yes
Weather	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No

Table 3.2.A. Results for model and features approach to mobile applications one to eleven

#id	12	13	14	15	16	17	18	19	20	21	22
Name	Επαγγελματίας αγρότης	AgWeb	Field Tracker Pro	Agroterra	Agrotrade	Farms	YieldCheck	Growing Degree Days	Farm Progress	Agri Marketing	Agriculture Price Alert
Members Section	Yes	No	No	No	No	Yes	No	No	No	No	No
e-Shop	No	No	No	No	No	No	No	No	No	No	No
e-Auction	No	No	No	No	No	No	No	No	No	No	No
Commodities prices	No	Yes	No	No	No	No	No	No	Yes	Yes	Yes
List of involved entities	No	No	No	No	Yes	Yes	No	No	No	No	No
Ads	No	No	No	Yes	Yes	Yes	No	No	No	No	No
Job ads	No	No	No	No	No	Yes	No	No	No	No	No
News	No	Yes	No	No	No	Yes	No	No	Yes	Yes	No
Events Calendar	Yes	No	No	No	No	Yes	No	No	No	No	No
Education material	No	No	No	No	No	No	No	No	No	No	No
Forum	No	No	No	No	No	No	No	No	No	No	No
Help Videos	No	No	No	No	No	No	No	No	No	No	No
Maps Integration	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Farm managment	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No
Weather	No	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No

Table 3.2.B. Results for model and features approach to mobile applications twelve to twenty two

3.3. Technological and commercial statistics approach

Our second approach covers the operating system availability as well as commercial statistical, i.e., ratings, downloads, revenue model, locale etc.

- Platform: We checked the mobile operating system on which the applications are offered
- Downloads Android: We checked how many times the application has been downloaded through Google Play and we note at this point that corresponding data are not officially available from Apple for iOS
- Reviews and rating iOS: We checked how many times the application has received reviews and the mean rating it has, as offered by Apple at AppStore, which is a very significant metric that attracts users and shows user satrisfaction

  Reviews and rating Android: We checked how many times the application has received reviews and the mean rating it has, as offered by Google at Google Play, which is a very significant metric that attracts users and shows user satrisfaction
- Format and in app Purchases: We checked the revenue model followed, that is whether it was free of charge or if a payment was needed and what kind of in app purchases or subscription packages were offered
- Company base: We checked the country on which the company is based
- Languages: We checked the languages in which the application is offered

In the following two tables we display the results of our review given the model and features approach and the findings of this section will be presented in chapter 3.4. , along with the other results of the review.

#id	1	2	3	4	5	6	7	8		9	10	11
Platform	iOS, Android	iOS, Android	iOS	iOS, Android	Android	iOS, Android	iOS, Android	Android		iOS, Android	iOS	Android
Downloads Android	N/A	5,000 - 10,000	N/A	500 - 1,000	50 - 100	N/A	50 - 100	1,000 - 5,000		1000-5000	N/A	1000-5000
Reviews and rating iOS	125 (4+)	31 (4+)	44 (4+)	N/A (4+)	N/A	N/A (4+)	5 (4+)	N/A		N/A (4+)	34 ratings (4+)	N/A
Reviews and rating Android	N/A	4.4 (114)	N/A	2 (5)	2 (4.5)	N/A	N/A	67 (4.3)		42 (4.0)	N/A	57 (3.8)
Format and in app Purchases	Free	Free edition with in app for addons (Three addons 9.99$ each)	Free edition with in app for Sirrus Premium (49.99$ and 499.99 $)	Only free edition	Free	Free	Paid $24.99 on iOS, $8 on Android	Free to search, buy, sell	Paid 0.89€ / month to access all sellers' contact details	14day trial, basic edition for free, other editions from 150 to 750/ year	Free (simple access to 6100 labels), Mobile Lite (added a "favorite" feature", Mobile Full(full access)	Free version (limited), Subscription version (1 month free), after from 16 to 406 euros, depending from the number of licences
Company base	France	United States	United States	United States	Canada	United States	United States	Greece		Croatia	United States	Greece
Languages offered	English	English	English, Portuguese, Russian, Spanish	English	English	English	English	English		English	English	Greek

Table 3.3.A. Results for technological and commercial statistical approach for mobile applications one to eleven

#id	12	13	14	15	16	17	18	19	20	21	22
Platform	Android	Android	iOS, Android, windows phone, Blackbery	iOS, Android	Android, iOS	Android	iOS	iOS, Android	iOS, Android	iOS, Android	iOS
Downloads Android	1000-5000	10000-50000	N/A	10000-50000	N/A	1000-5000	N/A	10000-50000	10000-50000	1000-5000	N/A
Reviews and rating iOS	N/A	N/A	N/A	4+	N/A	N/A	N/A	25 (4+)	9 (4+)	N/A (4+)	N/A (4+)
Reviews and rating Android	41 (4.5)	95 (4,2)	N/A	4 (5)	N/A	5 (3.4)	N/A	54 (3.2)	1 (3.7)	55 (3.9)	N/A
Format and in app Purchases	Free	Free	60 days trial, free (5 users, 40 fields), 249$/year (5 users, 40 fields), 479$/ year (20 users, 200 fields)	Free	Free	Free	Free	Free	Free	Free	5$
Company base	Greece	United States	United States	Spain	Korea	United States	United States	United States	United States	United States	United States
Languages offered	Greek	English	English	Spanish	English	English	English	English	English	English	English

Table 3.3.B. Results for technological and commercial statistical approach for mobile applications twelve to twenty two

3.4. Mobile applications review results

In this section we present our findings for the mobile applications platforms, which include: i) the statistical analysis from model and features approach, ii) the analysis for technological and commercial criteria application and iii) our empirical approach. Regarding the model and features we present our results in the following table:

Members Section	e-Shop	e-Auction	Commodities prices	List of involved entities	Ads	Job ads	News
50%	9%	4%	36%	13%	36%	4%	45%
Events Calendar	Education material	Forum	Help Videos	Maps Integration	Farm Tracking	Weather	
18%	13%	0%	4%	59%	36%	54%	

Table 3.4.A. Results for model and features approach to mobile applications

Our first finding is that thirty six of the applications feature live data for commodities prices; but only four percent has implemented auction options and nine percent e-shop capabilities, from which we conclude that other means are preferred as revenue methods. We believe that security and usability issues drive most users to engage to bidding activities or online purchases through laptops or desktops, which offer a greater variety of tools and level of confidence since most users are most accustomed. In these category there are exceptions from well established companies like Amazon or e-bay which offer mobile applications, though their orientation is very different.

Our second finding is that most applications feature personalized weather alerts with notifications and integrated maps, which binds with the advertisement, news and price update percentages leading to an informative model of business. The latter tie naturally and strongly to many farm or livestock management applications and some are highly sophisticated allowing for the creation and editing of customized field profile from satellite images.

Our third finding from this approach is that the education aspect is neglected with very few offering videos, tutorials or accompanying text and in general the community aspect either be forums or shared calendars for events, is also not frequently met. This finding combined with the user section percentages leads us to believe that in most applications the members sections exists mainly for authentication reasons, though not always since some applications offer their services

without registering. In the following table we present our findings from the technological and commercial statistical approach:

iOS	Ios rating	Android	Commodities prices	iOS and Android
72%	Thirteen have rating greater then four out of five and three didn't have any	81%	Eight have rating greater than four out of five, five have rating between 3 and four and five don't have any	54%
Downloads (Android)				
10 - 50			5%	
50 - 100			9%	
501 - 1,000			5%	
1,001 - 5,000			27%	
5,001 - 10,000			5%	
10.000 – 50.000			14%	
Revenue methods				
Free			59%	
Free with payment optiong for upgrading of functionality			32%	
Purchase only			9%	
Country				
USA			14	
Canada			1	
France			1	
Croatia			1	
Greece			3	
Spain			1	
Korea			1	
Languages				
EN			17	
GR			2	
SP			1	
GR,EN			1	
More than two languages			1	

Table 3.4.B. Results for technological and commercial statistical approach for mobile applications

Our first finding is that only half of the applications were developed for both applications and we didn't find one for the Windows mobile or Blackberry platform.

The prevalent revenue method is freeware in conjunction with in-app purchases, which is a well established model followed in many other types of mobile orientated software. Furthermore many have a high volume of downloads which indicates increased consumer interest and the ratings were found high; mostly four out of five which point to increased user satisfaction from the end product.

Rating is a very important finding because when applications are installed and rarely used, they are not usually rated since the users are not interested in them. Given the high ratings we found, we conclude that there is evidence of intense usage and satisfaction, which is further strengthened by the number of downloads; especially if we take into account that these applications target highly focused users.

Regarding the locale we found that sixty three percent originated from U.S.A. and seventy percent was offered only in English while for the three Greek applications we found, only two were offered in English. For other non U.S.A. applications we examined such as the Croatian and Spanish ones we found that all of them were offered only in English. This leads us to believe that at this point the global character of mobile applications is the leading decision point for language support. At this point we report our findings from our empirical approach, which will be combined with other parts of the report at the corresponding results in chapter six.

The first model we found was that of a informative nature offering agrinews, weather predictions, commodities and their price (id#13, #id4) and a more specialized one regarding Bolivian and Spanish speaking users, which offers rich educational material in the format of videos (id#15). A variation of this type encompasses links with informative agricultural oriented material and blogs; but also allows for direct access to them, through the application or by the predefined browser (id#20) and some who differentiate from the aforementioned on the news part by focusing on daily news (id#21).

We found price alert applications which emphasize on commoditie pricing and alert systems that send notifications when prerequisities are met (id#22) and some who expand the live update system by including prices for livestock, watch lists; but also provide enhanced pricing details i.e., time series, statistics, graphs etc (id#1). On this type we also found applications, where one can search a multitude of market types, spanning many different categories and types of products with an easy to use search box (#id2). A well designed application from Korea provides the option to

register a product and a referring system that collaborates with search capabilities, providing aimed information for producers related to the product searched.

Another finding is applications that facilitate map filter search, that is they use points on the map, product types and search radius and for the results the user can select the products or points and view more information as well as proceed with online purchases (#id8). Another finding is a Greek based application orientated to e-services, by bridging different actors like farmers, experts, nutritionists and logistic services expanding the original catalog and informative model (#id10).

A well established type of applications is that of knowledge-based ones, which are categorized under the generic term farm or livestock management and cover many different areas. While these applications depart from the classical e-marketplace model, they hold high value for a review, since the options they provide on the information scale heavily influence what users look for, in an informative based model and some combine these two.

We found an application which supports mapping and coverage estimation blended with commodities price information, weather forecast and training material (#17). On a more specialized one, users can manage field growth, by inputting data on various checkpoint which are correlated with weather data, older statistical records and provide an estimation for the harvesting period (#id19); on this model we also found options for growth predictions by using field size, and seed type (#id18).

Other well developed applications offer complete management by addressing planning, monitoring and analysis of all activities of a farm , i.e., tillage, planting, crop protection, fertilization, irrigation (#id14). Furthermore some offer tracking of input usage quantities, costs and work hours for every activity and multiyear statistics for every field; but also advanced pest and disease detection algorithms to alarm farmers if there is a risk of pests or diseases (#id3). We also found more economical driven ones were data are stored over cloud servers and offer online calendar, cost analysi, revenue predictions, inventory management,sales, expenses and capital investments with accompanying video tutorials (#id11). These findings will be combined with the results from other parts of the report and their significance and potential synergies will be analyzed in chapter six, where we present our results.

4. Literature review

4.1 Methodology

For our literature research we reviewed thirty articles, in order to identify best practices in e-commerce solutions and mobile applications development that have already been successfully used, on a national or an international level. Due to the technological dimension of our report we focused on the main pathways developers and designers follow; but also to articles associated with agribusiness and agricultural services and case studies found on ICT and business journals. Furthermore we examined youth entrepreneurship in agribusiness on its own right and in conjunction with mobile applications and emerging economies, to better address issues similar to our research goals.

Regarding the article status and locale they originate from peer reviewed journals, related magazines, white papers, conferences etc. from both Greek and international sources, mostly from the United States and China which are the dominant sources at this point. The topics covered where broad, spanning from e-marketplace case studies and e-trading to mobile applications and rural development and in the tables that follow, we list the agribusiness topic covered along with bibliographical keywords attached to them. The aim of this table is to provide a holistic view of the research conducted and to facilitate future researchers, with an immediate preview and a referencing resource.

#	Agribusiness topic	Keywords	Article tile
1	food supply chain	marketing of agriculture products, food supply chain, direct agricultural, marketing, product branding	Agricultural Marketing Competitive Strategies and Innovative Practices in Greece
2	e-marketplace case study (Alibaba)	e-marketplace, e-commerce strategies	A Model for Value-Added E-Marketplace Provisioning: Case Study from Alibaba.com
3	developing countries	emerging economies, ecommerce	Importance of Mobile Technology in Food and Agribusiness Value Chains: Electronically Linking Farmers with Markets
4	agri-marketplaces	e-commerce, e-markets, agriculture, agri-food sector survey	A Survey of Greek Agricultural E-Markets
5	electronic trade platform case study (MarketMaker)	contingent valuation, e-commerce, nonparametric methods, willingness to pay	The Economic Impact of Services Provided by an Electronic Trade Platform: The Case of MarketMaker
6	e-marketplace adoption	e-commerce, B2B, E-marketplace, Agricultural product logistics, Vegetable Trading, Medium Long-term Spot Trading	B2B E-Marketplace Adoption in Agriculture
7	e-commerce and agrifood	E-commerce, E-business, Agribusiness, Agri-food chain, Remote service and maintenance	Internet Use in Agriculture, Remote Service, and Maintenance: E-Commerce, E-Business, E-Consulting, E-Support
8	m-government	mobile phones, mobile devices, e-government, m-government, agriculture, farmers	Developing a smartphone app for m-government in agriculture
9	green entrepreneurship	Green Entrepreneurship, ERP, GIS, International, E-market, Agriculture	Development Software for Resource Planning in Agricultural Nutrition - The Case of 'Green Entrepreneurship' (Greece)
10	internet adoption and e-commerce	e-commerce, supply-chain, transaction costs, ordered Probit	Adoption of Internet Strategies by Agribusiness Firms
11	e-marketing	e-marketing, internet, network, database, e-commerce, agro-food and drink sector	E-marketing and Internet Functions of Agricultural Products in SME in Greece
12	online marketplaces	Internet, entrepreneurship, online business, agribusiness,e-commerce	The role of internet in enabling performance for farmers
13	agricultural website evaluation	Agricultural product, E-commerce ,website evaluation	Agricultural E-Commerce Sites Evaluation Research
14	social media marketing	Social media, social networking, agribusiness, ICTs	The Use of Social Media among Students of Technology Agriculture and their Role in Promoting Agribusiness
15	mobile applications	Agribusiness, mobile applications	Mobile applications for monitoring and evaluation in agriculture

Table 4.1.A. Keywords and articles from literature review for articles one to fifteen

#	Agribusiness topic	Keywords	Title
16	youth entrepreneurship	youth entrepreneurship, economic growth, agribusiness management, credit facilities and Functional groups	Realizing Equal Opportunities among Youth Groups in Agribusiness Sector in Accessing Government Financial Credit Facilities
17	e-commerce for emergent countries	e-commerce , emerging economies	Emergent E-Commerce in Agriculture
18	e-commerce in China	agriculture, e-commerce, Third-party e-commerce, collaborative e-commerce	Constructio n of Agricultural E-commerce Platform in China
19	rural and small town agribusiness	rural and small agribusiness e-commerce	e-commerce as a business strategy: lessons learned from case studies of rural and small town businesses
20	m-commerce	Social Commerce; B2C; Agricultural e-commerce; M -commerce	Development model of agricultural E-commerce in the context of social commerce
21	e-commerce on forestry	Website, Internet services, E-commerce, Forest products	E-commerce for Forest Products in Greece
22	e-commerce impact on Greece		Use and impact of the internet in the gree k agricultural sector: final results of a survey of web site owners
23	opensource CMS software	Website, agricultural unions, open source software	Implementation of a dynamic site for agricultural unions
24	e-marketplaces failure	outcomes from interview of "why marketplaces failed"	Why Did Electronic B2B Marketplaces Fail? Case Study of an Agricultural Commodity Exchange
25	ICT adoption	ElectronicCultivation,InformationTechnology,Informationand Communication Technology (ICT), Agricultural Technology, Agriculture, Agribusiness, Adoption, Incentive, Barriers, Economic, Productivity, Governance,	Problems and prospects of adopting ict in agriculture: some comments
26	ICT	Rural e-market, Shared Ownership, Local Leadership, Meta Market	Developing a Rural Market e-hub. The case study of e-Choupal experience of ITC
27	P2P, L2L, E2E		A Survey of Information Systems Reaching Small Producers in Global Agricultural Value Chains
28	information technologies adoption	Information and communication technologies, agriculture improvement, agribusiness electronic commerce	The role and potential of information technology in agricultural improvement
29	mobile tools case study (Xamarin)	Mobile devices, applications, Android, iOS, Windows Phone, Xamarin, expense	Mobile Applications for Agricultural Online Portals – Cross-platform or Native Development
30	cloud computing technology	Cloud Computing, SaaS, Cloud services, ICT, virtualization	Review: Using Cloud Computing Technology in Agricultural Development

Table 4.1.B. Keywords and articles from literature review for articles sixteen to thirty

4.2 Literature review results

Our first finding is that the mostly covered topic is that of cost analysis and more specifically, in which ways it can be reduced since by trimming transaction and maintenance costs there is an profit increase. This can be achieved by enhancing the information flow and search, adjusting posted prices and also by facilitating and monitoring negotiations between geographically separate buyers and sellers (Xiaoping et al 2009). The use of online platforms and mobile applications largely enable this pathway, since communication costs on the Internet are largely independent on data volume; also geographic distance between sender and receiver, is mostly unimportant in search and negotiation. On this track we also found that considerable decrease of trading costs can be achieved by digitizing all relevant information, i.e., when cattle or fresh produce are sold by digital video rather than by physical display (Mueller 2008).

Another aspect of e-marketplaces that leads to cost reduction is price information availability which makes it easier to secure the optimal prices; e-marketplaces offer a convenient way to compare prices and products from a single source, rather than consuming time by contacting each individual supplier. This is further enhanced by the fact that established e-marketplaces provide a level of trust for the buyers as they are dealing exclusively with suppliers who are certified members so they provide a trusted sales channel (Vassiliadou et al 2011).

An important link to the cost chain is that of the intermediate and cost decrease that is claimed without their presence is significant; we reviewed cases that it can reach up to forty eight percent in one month and for cases where consumer saved almost sixty percent from buying costs, rendering the absence of intermediaries (Henderson 2005).

Another widely noted aspect of cost reduction that can be achieved by online system is the reduction of customer-service costs, by sustaining customer relationships and extending marketing messages. When the enterprises aim at their participation in the internet society the benefits are high, since electronic systems are ready to serve customers all over the world twenty four hours per day seven days a week (Andreopoulou, 2008). Both buyers and sellers can benefit from the fore mentioned since efficient transaction processes can be outsourced through a platform

or a mobile application thus reducing the costs in comparison to those of a in-house development.

Our second finding is the impact of information flow which is multi sided beyond that of cost reduction that was fore mentioned, since platforms need to be informative and provide high quality information related to quality products. In some cases, researchers agree that customers are willing to pay for specialized services, if they conform with their needs (Zapata et al 2013). In general the exchange of information about agricultural products, their nutritional characteristics, etc., can be greatly increased through platforms and mobile applications during e-commerce transactions.

Concerning the types of information, our review unveilied cases where forty one percent of the related websites that offered local information and topics, but also helped the local community to grow. This trend was also firmly displayed in the finding that almost eighty five percent of agribusinesses include thematic and detailed information products (Andreoupoulou et al 2011). In addition, web based technologies provide the opportunity to link individual actors in the food production chain together, irrespective of the market hierarchy enabling them to improve market access through online transactions.

Our third finding is that another important aspect in agricultural businesses is the use of mobile technology (Karetsos, Costopoulou & Sideridis 2014), since farmers form a special group of users, in the sense that they have limited access to policy making centers. This leads to them having difficulties gaining the necessary information or using the available public services (Chatzinotas et al., 2006). Studies show that farmers use smart phones more as a working tool and less for entertainment (USA Today 2013) and that seventy percent of the surveyed farmers use their smart phones for agricultural information and services (Agriculture.com 2011).

Four of the reviewed articles, refer to mobile technologies and their advantages mostly prompting to their simplicity, intuitiveness, low cost and options to store offline many formats of education material, i.e., articles, tutoring videos and agriculture techniques (Masner et al 2015). These characteristics make them highly accessible to rural regions, developing countries and poor farm areas, since the cost of purchasing and using mobile devices is significantly lower in respect to other technologies. Furthermore poor web accessibility can become a significant deterrent to the success of a mobile system and the key point is that partial access is feasible for forms of data with small volume like agrinews even on a poor mobile network, which

aren't with other means, i.e., Wi-Fi accessibility on a rural area (Karetsos, Costopoulou & Sideridis 2014).

Greek oriented research for agribusiness Greek entrepreneurship, showed that sixty six firms have web presence and e-commerce capabilities; out of them, ninety three point six percent is reported to promote their products by providing information to customers and almost eighty five support communication with the customer through suitable forms of communication. These mostly aim to provide additional information on the products, services, transactions, receive complaints, give advice and support after sales service (Tsekouropoulos et al 2011).

Articles related to hyper-focused types of information where also found, especially information related to crops, fields and types of agriculture since current agriculture production methods are driven by demand, high specialization on data collection and analysis (Milovanović 2014). Information on seed, water, nutrients and plant protection have to reach farmers precisely and fast, thus we have information-intensive systems for precise farming techniques based on knowledge.

The general consensus is that farmers should be aware of ICT technologies and these services are an integral part of agricultural production management, since there is great untapped economic potential. Examples include precision farming and livestock management, where ICT could facilitate more efficient decision making not only for managers of enterprises related to agriculture, but also for policy makers.

We found reports that farmers still have problems accessing important information in an easy to comprehend format, prohibiting them to make timely decisions for agricultural production improvement. This is an issue that should be addressed, since with improved evidence of data, detailed analysis of costs and sophisticated marketing strategies, farmers are make better decisions and greater profits. In addition, implementation and use of ICT can significantly support increase of competitiveness of theirs husbandries (Cecchini 2003).

Another finding is an aspect not usually addressed, which has to do with information importance for countries on the verge of entering larger markets. Former communist countries in Eastern Europe are faced with deregulation that represents logical implication of process of integration to European Union. This reinforces the need for timely and relevant information, in order to make decisions in agricultural sector and the other sectors related with supplier input, i.e., raw materials (Phougat, 2007).

We also found references to farmers and traders synergies, regarding market information, either to gain optimal prices or help the orientation of farmer's production to markets where better prices are expected. Information technologies can support in forecasting, which in turn can help farmers and traders and combined with other data and relevant information, they can be used for decision making about crops that can be produced in the next season (Milovanović 2014).

At this point we note key-features we collected as reported by developers, designers, researchers and entrepreneurs; regarding market characteristics, marketing, new market expansion and trading services our main literature findings are:

- Niche markets: Industrially manufactured food items are known in general to be profitable only when a minimum number of units are sold and while at first glance it may see as not worthwhile to produce on a small scale or to focus on products of little demand; but marketing products aimed to customers who are willing to pay more than tradition goods either out of necessity our out of specific tastes can produce high incomes in agribusiness.
- Market expansion: Unions and associations gain many benefits by using agribusiness web technologies by improving the recognition of the Union's work and efforts; but also enhancing the interactivity between Union members and the potential customers (Drosos et al 2011). Furthermore we found that platforms offer expansion possibilities and new marketing paradigms and that many agribusinesses have capitalized on the advantages of e-business to improve the marketing and trading of their products (Xiaoping et al 2009).
- Transparency: It may refer to either price or information and for commoditized products the electronic marketplace can benefit from shared product catalogs, by increasing the information spread thus motivating increased competition among suppliers (Tsekouropoulos et al 2011). While this may be viewed by suppliers as a reason for not participating in such platforms, they also benefit from increased integration due to the reduction of transaction and integration costs, since they don't need to contact, communicate and negotiate with buyers by more expensive means, like traveling or by telephone (Andreopoulou 2007).

Regarding specific characteristics for well established and successful e-marketplaces ,our main literature findings regarding are:

- An online platform or mobile application should focus on the usability factor (Luomakoski 2010), that is fluency and ease of use for a user enabling him to interact with a system without technological expertise. This applies heavily to users with physical difficulties or ones who are not acquainted with technology and should be in line with the definition of usability offered by the International Organization for Standardization: "the effectivene ss, efficiency, and satisfaction with which specified users achieve specified goals in particular environments" (Hillier 2003).
- Online platforms and mobile applications should include educational material for users which extend its user target group to larger age based audiences; but also financial training by experts greatly increases the chances of entrepreneurs securing appropriate and affordable finance for young entrepreneurs. (Ibuathu & Kubaison 2013).
- Farmer-related information like categories of seeded crops, size of land, specific crops, dropping seed, time of harvest, yields, production-related information, soil processing, production equipment and the other agricultural inputs should be in a digital format (Milovanović 2014). Other reports show that generic agricultural oriented information, i.e., news, blogs to weather forecast, availability of credit, as well as expert advice about maintaining crops in healthy state has to be included, in order to create a complete platform (Teodescu 2014).
- Regarding niche markets we found that smaller agribusinesses can compete in better terms with large ones, since they don't have the large marketing budget required for tradition media marketing; but with a well organized SEO the firm's website can appear high on search results (David et al 2007). We found numerous examples of product specialization and market niches provided in case studies, i.e., sterling Bio-Technologies (Sterling, Colorado) that manufactures bio-based skin care products, stained Glass Express (Waterville, Maine) tjat targets its e-commerce activity at selling glass and supplies to hobbyists (David et al 2007).

The findings will be combined with the results from the other parts of the report and their significance and potential synergies will be further analyzed in chapter six where we present our results.

5. Questionnaires, interviews and focus groups findings

5.1. Methodology

To further analyze the requirements and discover the needs of agribusinesses for e-trading and e-marketing as well as identify e-services that could be provided through an online platform and mobile applications, we used structured questionnaires, conducted interviews and organized workshops with involved stakeholders.

Questionnaires were handed out to one hundred and ten students encompassing two B.Sc. pathways, that of precision agriculture and food science and five HNC pathways that of animal management, biological sciences, travel and tourism management, horticulture and business. This target group offer a multitude of valuable characteristics: i) the geographical distribution and rural origin of the students, ii) their hands on experience from real life farming environments and understanding of local practices, iii) their knowledge of rural communities acquaintance with technology and iv) their current field of studies which tie naturally with the goal of this research, since youth entrepreneurship in agribusiness is the main aim of this proposal.

Furthermore we participated and gathered results from thirteen interviews and two focus groups with involved stakeholders, the first one having twenty three and the second nine participants. The participant's professional skills background cover a great range of agribusiness oriented expertise, more specifically farmers, beekeeping, marmalade producers, olive oil standarazation, cow breeding, food science technologists, agro tourism business owners, ministry representatives and a platform designer.

The presentation of our findings includes: i) data from the structured questionnaires handed out to our students in tables containing the mathematical results, followed by their analysis, ii) the quantitative and qualitative results from our interviews and iii) our results from the focus groups along with qualitative analysis for the required features, from the questionnaire handed out at the end of the sessions. We separated the parts of our analysis, since the target groups are by in large different and the findings combined with the results from the other parts of the report and their potential synergies will be analyzed in chapter six.

5.2. Questionnaires analysis

Web site id	Percentage
We have a company web site (N=20/110)	18,18%
Web site is optimized for mobile browsing	1,8%
Web site supports multiple languages	2,7%
Web site is friendly to people with disabilities	0,9%
Web site usability	**Percentage**
We have a website and we use it for information	51,9%
We have a website and we use it for customer feedback	33,3%
We have a website and we use it for online sales	14,8%
Web site content update	**Percentage**
We have a website and the content is updated on a daily basis	16,7%
We have a website and the content is updated once per week	5,6%
We have a website and the content is updated once per two or three weeks	5,6%
We have a website and the content is updated once per month or more	66,7%
We have a website but don't update it	5,6%
Web site is updated by us	29,4%
Web site is update by an employee	47,1%
Web site is updated by an external collaborator	23,5%
Web site is not updated	0%
Web site development and mobile applications	**Percentage**
Web site was developed by our company	50%
Web site was developed by external collaborator	50%
Do you use a Smartphone or tablet? (All respondents)	91,8%
We have developed a mobile application	0%
No but we are planning to develop one	44%

Table 5.2.A. Questionnaires results for web site id

In the Appendix we include a table for the geographical distribution of the students, and eighty out of the one hundred and ten surveyees originate from rural regions; twenty of them involved in a family owned business. For the latter, we found that there is a low percentage of online presence in all aspects, that is most don't have a website and the ones who do, don't update it frequently. This leads us to conclude that there isn't investment on this aspect of business, especially if we take into account that half of them constructed the web site themselves, while their expertise is not IT orientated.

We also found that almost ninety two percent of all students use a smart phone though none of the involved in a family business answered that they have developed a

mobile application. On the other hand forty four percent of them plan to, from which we conclude that they understand their significance and usefulness in commerce, despite the fact that their family business isnt using them. In table 5.2.B. we summarize our findings for the current usage of online platforms and mobiles applications for e-trading, e-services and e-marketing, with multiple question regarding the latter and table 5.2.C. , contains our finding regarding the surveyeess intention on future usage.

Current usage of web based platforms or mobile applications for e-trading, e-services and e-marketing			
	Don't use one	Use one but not satisfied	Use and satisfied
Do you use any web based platform for e-trading and if yes how you would rate the quality of services?	80,0%	3,6%	16,4%
Do you use a mobile application for e-trading and if yes how you would rate the quality of services?	84,5%	0,9%	14,5%
Do you use any web based platform for e-services and if yes how you would rate the quality of services?	77,3%	1,8%	20,9%
Do you use a mobile application for e-services and if yes how you would rate the quality of services?	80,0%	5,5%	14,5%
Do you use any web based platform for e-marketing and if yes how you would rate the quality of services?	59,1%	11,8%	29,1%
Do you use a mobile application for e-marketing and if yes how you would rate the quality of services?	74,5%	3,6%	21,8%
Current usage of web based platforms or mobile applications for e-marketing tools			
We use email marketing	28,7%		
We use video marketing	15,5%		
We use SMS marketing	10,3%		
We use social media marketing	16,1%		
We conduct search engine optimization campaigns	8,6%		

Table 5.2.B. Questionnaires results current usage

Future usage of web based platforms or mobile applications for e-trading, e-services and e-marketing			
Retail sales		Bulk sales	
I would use a web based platform	54,7%	I would use a web based platform	50,7%
I would use a mobile application	33,8%	I would use a mobile application	32,9%
I wouldnt use either	11,5%	I wouldnt use either	16,4%
Bulk purchases		e-services	
I would use a web based platform	57,3%	I would use a web based platform	52,6%
I would use a mobile application	28,0%	I would use a mobile application	34,2%
I wouldnt use either	14,7%	I wouldnt use either	13,2%

Table 5.2.C. Questionnaires results for future usage

Our first result is that at least half of the questioned would use a web based platform for all types of sales, purchases and services and that on average thirty percent would use a mobile application, which in conjunction with the low percentages found on the negative answer, lead us to have a clear view for the need for such mediums. This finding is further strengthened by the fact that eighty percent of the surveyees don't use at this point any web based platform or mobile application, that is while most don't use one at this point, they would do so in the future.

Another finding is from the subset of the group which at this point is evolved in a family business regarding the e-marketing tools questions, with all of them receiving low percentages. If we couple this with the fact that younger personnel is usually in charge of such company functions and that fifty nine percent would use web based platform for e-marketing and seventy four a mobile one, we conclude that while there is a need and understanding for the usefulness of these tools in younger audience, they are not yet utilized properly.

In the following tables we summarize our results for surveyees opinion, regarding the required features and specific functions an online platform or mobile applications should include.

To what extent the following features would be useful to you if it they offered by an web based platform or mobile application orientated to e-trading or e-services					
Features	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
information about your company	39%	33%	20%	6%	2%
agricultural news	38%	26%	19%	10%	6%
legislation news	36%	28%	25%	5%	5%
weather alerts	33%	29%	24%	10%	5%
epidemic alerts	31%	23%	26%	15%	5%
e shop for retail sales	30%	34%	21%	11%	5%
new cultivation techniques	30%	31%	19%	10%	10%
e shop for bulk sales	29%	35%	23%	8%	5%
e market for purchasing of machinery or production related goods	29%	35%	24%	8%	4%
advertising services	28%	33%	23%	10%	6%
legal services	27%	32%	25%	12%	5%
insurance services	25%	33%	25%	10%	8%
logistics	24%	31%	24%	15%	6%
technical services	21%	36%	21%	17%	5%
transport	21%	38%	35%	5%	2%
e market for auctioning of goods	19%	29%	25%	15%	13%
To what extent the following features would be useful to you if they were offered by an web based platform or mobile application orientated to e-marketing					
Features	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Search engine optimization campaigns	43,64%	33,64%	20,00%	1,82%	0,91%
SMS marketing	33,64%	31,82%	23,64%	10,00%	0,91%
Video marketing	30,91%	46,36%	19,09%	2,73%	0,91%
Social media marketing	25,45%	37,27%	30,00%	6,36%	0,91%
Email marketing	22,73%	41,82%	24,55%	8,18%	2,73%

Table 5.2.D. Questionnaires results for features

Our findings are that the three most sought out features are those of informative nature and it is of high interest that legislation news appears very high on the percentages which we attribute to the Greek legislation status, which is known to be

hard to follow yet has a great impact on doing business. Furthermore if we look into the cumulative percentages of agree and strongly agree category they receive at least sixty four percent which we consider as high. Moving on to the alert category for the weather and epidemic features, we found that they appear right after the informative ones with thirty percent on the strongly agree results.

We also found that the tuple of e-shop for retail, e-shop for bulk and e-market for b2b purchases receives high percentages for strongly agree opinions and at least sixty four percent approval rating on the cumulative agree and strongly agree percentages, thus there is a clear interest for b2c and b2b options. If we take into account the fact that b2b purchases and e-market for purchasing of machinery by electronic means is a rarely encountered agribusiness practice in Greece, we think that the twenty nine percent on the strongly agree they both received is a very significant finding. In this class of percentages for the strongly agree answers we found another informative oriented feature, that of new cultivation techniques with thirty percent and for educational needs and for the more service oriented ones, we found that at least fifty percent answered agree or strongly agree.

The feature of e-market auctioning gathers forty eight percent for cumulative agree and strongly agree and while it appears last on the ordered list, we believe that given its hard technical nature and the fact that such ways of doing business are rarely met in Greece, the twenty eight cumulative percent of disagree is an expected percentage.

In general if we examine the average of the cumulative percentages for agree and strongly agree responses we find that they receive on average strong sixty percent while the corresponding percentages for disagree and strongly disagree reach only sixteen percent, hence we believe that they should be offered by a platform or mobile application.

Regarding the e-market requirements, there is a clear preference for search engine optimizations techniques followed by SMS marketing, which ties strongly with other findings in many parts of this report, since such technologies have a strong presence in rural environments. Furthermore marketing by online videos and social media promotions receive at least seventy percent of cumulative percent on the agree and strongly agree answers. The fore mentioned lead us to the conclusion, that the surveyees believe that a web page must appear high on search results and they have an good understanding of the significance of this factor, fused with local and rural

practices for SMS but also require for videos and social media to address broader audiences with a strong message.

We consider email marketing lower percentage as an expected one since in general newsletter practices are not well established, especially at a local level despite their significance since in agribusiness such corporate structured news are not common practice in Greece. In the following tables we summarize our results for the surveyees views on what would be beneficiary and prohibitory for using such technologies:

To what extent the following aspects would be benefited by an web based platform or mobile application orientated to e-marketing					
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Better feedback from the customers	45,45%	31,82%	19,09%	2,73%	0,91%
Fast communication with customers	43,64%	33,64%	20,00%	1,82%	0,91%
Developing new products	43,64%	35,45%	15,45%	4,55%	0,91%
Reduction of sales costs	37,27%	40,00%	10,91%	5,45%	6,36%
Increased brand equity or /and brand awareness	30,91%	46,36%	19,09%	2,73%	0,91%
New markets	33,64%	31,82%	23,64%	10,00%	0,91%
Greater customization of products	25,45%	37,27%	30,00%	6,36%	0,91%
Increased market share	22,73%	41,82%	24,55%	8,18%	2,73%

Table 5.2.E. Questionnaires results for benefited business aspects

To what extent the following aspects of e-commerce would prohibit your consumers					
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Apprehension of personal data protection	32,73%	28,18%	20,00%	14,55%	4,55%
Preference for direct purchasing in shops	28,18%	37,27%	22,73%	8,18%	3,64%
Delivery costs	24,55%	23,64%	31,82%	12,73%	7,27%
Difficulty to evaluate the quality of the product	20,91%	30,00%	38,18%	6,36%	4,55%
Delivery problems	18,18%	30,91%	26,36%	19,09%	4,55%
Lack of choice of services or products on-line	17,27%	16,36%	36,36%	20,00%	10,00%
Lack of knowledge	16,36%	29,09%	36,36%	13,64%	4,55%

Table 5.2.F. Questionnaires results for prohibitory factors

Our first finding is that most believe they would benefit in many aspects of their future business, with customer communication and feedback receiving forty five percent, followed by the important finding of new product development reaching forty three percent. These percentages display the trend in the rural youth of a well established view, that many new ways of managing, producing and promoting agriculture products can be achieved, by improving direct communication with the customers but also by broadening their product catalog.

Another finding we consider important that such technologies can cut down costs, help new markets penetration and establish their brand at a local or international level or equivalently they believe that exports, local awareness and market expansion, is a dimension that should be pursued by such means. Also we found there is a high interest into making customized products which is not a practice accustomed to Greek farmers but as it is displayed in other parts of the report, niche markets provide great opportunities.

On the prohibitory factors, security issues for credit cards, transactions and personal data protection were found on one out three surveyees since such practices for agribusiness in Greece are not so common. Furthermore delivery issues and hands on view of the products by customers were displayed as prohibitory factors, though the corresponding percentages are low and point to the belief, that such problems can be addressed. In the following tables we summarize our results for the surveyees general views on e-commerce, covering warehouse and productions related issues, intermediate role, and company size and government incentives.

To what extent e-commerce affects the following aspect of your business					
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
It will improve your company's ability to manage inventory or production related procedures	24,55%	44,55%	19,09%	11,82%	0,00%
It will be easier to provide information about complex products	20,91%	43,64%	30,91%	3,64%	0,91%
The size of your enterprise affects you positively in adopting them	20,00%	28,18%	39,09%	9,09%	3,64%
It will greatly reduce the role of local dealers in your industry in the next years	14,55%	36,36%	33,64%	10,91%	4,55%
The type of your products affects you positively in adopting them	14,55%	31,82%	40,91%	10,00%	2,73%
There are government influences or incentives to adopt them	5,45%	21,82%	25,45%	30,00%	17,27%

Table 5.2.G. Questionnaires results for e-commerce

Our findings from these questions are that logistics and warehouse management techniques as well as information channels for product details, received the highest percentages on the strongly agree answer. Both are very significant since they display that youth involved in agribusiness trust and believe the benefits of automazation and its strengths and that also most aim at producing new differentiated products, which they want to promote by using web technologies.

Another finding is the lack of government incentives and a concern on how their products can fit such specifications which is justifiable, since these approaches aren't a common ground. On the role of intermediates we found that half of them agree or strongly agree on the belief that their intervention will be reduced, though they seem only fourteen percent strongly agrees, pointing to the current status the intermediate have.

5.3. Interviews and focus group analysis

The results presented in this section include both qualitative and quantitative results, with the latter stemming from questionnaires handed out at the end of the interviews and the focus groups as well as from the answers we received. In the following table we present our results, from the interviews regarding their web site id, usability, content, mobile usage and e-marketing.

Web site id	Percentage
We have a company web site	84,62%
Web site is optimized for mobile browsing	72,73%
Web site supports multiple languages	81,82%
Web site is friendly to people with disabilities	18,18%
Web site usability	**Percentage**
We have a website and we use it for product information and promotion	92,00%
We have a website and we use it for customer feedback	45,45%
We have a website and we use it for online sales	0,00%
Web site content update	**Percentage**
We have a website and the content is updated on a daily basis	0,00%
We have a website and the content is updated once per week	9,09%
We have a website and the content is updated once per two or three weeks	0,00%
We have a website and the content is updated once per month or more	54,55%
We have a website but don't update it	27,27%
Smarthphones and mobile applications	**Percentage**
Do you use a Smartphone or tablet?	92,30%
We have developed a mobile application	15,38%
iOS	7,69%
Android	7,69%
iOS and Android	15,38%
Online sales options	7,69%
Company features	15,38%
Members section	0%
No but we are planning to develop one	15,38%
Select the e-marketing tools you use if any	**Percentage**
Email marketing (Newsletters)	53,85%
Video marketing (YouTube promotion)	38,46%
SMS marketing	15,38%
Social media marketing	76,92%
PPC advertising (Search engine advertising)	61,54%

Table 5.3.A. Results from interviews for web site id and support, smartphone usage and e-marketing

With minor exceptions all of the respondents had a web site using current technologies, responsive and with multilingual support though accessibility issues were rarely considered. An important finding is that they are not used for online sales and are rarely updated, which implies that they facilitate basic company information and customer feedback; this is also emphasized in the percentages of email and video

marketing , from which we conclude they were constructed for basic online presence and some means of communication, but no real investment has been put into them. On the mobile aspect while almost all use a smartphone only two have developed an application and we found only one who offered for both platforms, with the informative options being important once again.

Future usage			
Would you use a web based platform to sell products directly to the customers?		Would you use a mobile application to sell products directly to the customers?	
No	15,38%	No	23,08%
Yes	76,92%	Yes	76,92%
Use one	7,69%	Use one	0,00%
Would you use a web based platform to sell products directly to your business partners?		Would you use a mobile application to sell products directly to your business partners?	
No	46,15%	No	53,85%
Yes	53,85%	Yes	46,15%
Use one	0,00%	Use one	0,00%
Would you use a web based platform for purchasing production related goods?		Would you use a mobile application for purchasing production related goods?	
No	30,77%	No	46,15%
Yes	69,23%	Yes	53,85%
Use one	0,00%	Use one	0,00%
Would you use a web based platform to purchase e-services for your business?		Would you use a mobile application to purchase e-services for your business?	
No	23,08%	No	38,46%
Yes	76,92%	Yes	61,54%
Use one	0,00%	Use one	0,00%

Table 5.3.B. Results from interviews for future usage of online platforms and mobile applications

In all questions for future usage, the respondents replied that they are willing to invest and use web based platforms though they are less perceptive on the mobile aspect especially for bulk sales and purchases, for which most noted mostly security issues and lack of acquaintance. The following tables 5.3.C. and 5.3.D contain our results for e-marking future usage and on their perception fot the impact of e-commerce on different aspects of their business.

To what extent the following features would be useful to you if they were offered by an web based platform or mobile application orientated to e-trading or e-services					
Features	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
information about your company	84,62%	7,69%	7,69%	0,00%	0,00%
customer feedback	84,62%	7,69%	7,69%	0,00%	0,00%
advertising services	69,23%	7,69%	7,69%	15,38%	0,00%
government related information	53,85%	7,69%	23,08%	7,69%	7,69%
weather alerts	53,85%	15,38%	30,77%	0,00%	0,00%
administrative information	53,85%	15,38%	30,77%	0,00%	0,00%
business news	53,85%	15,38%	23,08%	7,69%	0,00%
technical services	53,85%	7,69%	15,38%	23,08%	0,00%
legal services	53,85%	7,69%	7,69%	30,77%	0,00%
logistics	46,15%	7,69%	30,77%	15,38%	0,00%

Table 5.3.C. Results from interviews for future usage

The percentages lead to the conclusion that the informative model coupled with alerts as well as legislation news are the most sought out features, which follows closely the practices we encountered in our review of current online platforms and applications. Legislation news was expected to appear high on the strongly agree scale, since well established professionals have already faced numerous problems of this nature and as they noted during the interviews, most would extensively use a tool which could disengage them from bureaucracy. In the following table we present our results for the views of the surveyess regarding the impact on various business aspects, i.e., customer support, sales, costs, etc.

Would a web based platform or mobile application oriented for e-marketing, improve the aspect of your business					
Business aspect	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Fast communication with customers	84,62%	7,69%	7,69%	0,00%	0,00%
New Sales	76,92%	15,38%	7,69%	0,00%	0,00%
New Customers	76,92%	15,38%	7,69%	0,00%	0,00%
Faster discovery of customer needs	69,23%	15,38%	7,69%	7,69%	0,00%
Increased customer satisfaction	69,23%	15,38%	7,69%	7,69%	0,00%
Increased market share	69,23%	15,38%	15,38%	0,00%	0,00%
Increased profits	69,23%	7,69%	23,08%	0,00%	0,00%
Greater customization of products	61,54%	23,08%	7,69%	7,69%	0,00%
Reduction of sales costs	61,54%	15,38%	15,38%	7,69%	0,00%
Faster adaptability of customer needs	61,54%	23,08%	7,69%	7,69%	0,00%
Good customer relationships	61,54%	23,08%	15,38%	0,00%	0,00%
Increased brand equity or /and brand awareness	61,54%	23,08%	15,38%	0,00%	0,00%
Providing better service quality	53,85%	30,77%	7,69%	7,69%	0,00%
Brand engagement	53,85%	30,77%	15,38%	0,00%	0,00%

Table 5.3.D. Results from interviews for benefited business aspects

The percentages of strongly agree on all answers have a minimum of fifty three percent, which clearly indicates the strong belief amongst professionals, that these technologies can help in a multitude of ways. As in the questionnaires from the students, customer relationship oriented aspects come first and customized products again appears high on strongly agree percentages. Another important finding is that at least sixty percent believe in increased profits and in reduction of costs, that is they will incorporate them into their business model.

As it can be seen in the following table and was mentioned during the interviews, for factors which would dissuade customers, almost half believe that quality evaluation, payment methods, security issues and general knowledge of the technologies won't act in a negative way to the customer's decision.

What do you believe it's likely to dissuade your customers from buying on-line					
	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Difficulty to evaluate the quality of the product	15,38%	30,77%	7,69%	0,00%	46,15%
Payment problems	7,69%	7,69%	15,38%	15,38%	53,85%
Lack of knowledge	23,08%	7,69%	0,00%	15,38%	53,85%
Apprehension of personal data protection	15,38%	15,38%	0,00%	15,38%	53,85%

Table 5.3.E. Results from interviews for prohibitory factors

At this point we present our results for both quantitative and qualitative results from the focus groups, by displaying the results from the questionnaires handed out at the end of the focus group on the following table, their analysis followed by our qualitative results.

Features	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
information about your company	59,09%	18,18%	18,18%	0,00%	4,55%
e shop for bulk sales	50,00%	27,27%	18,18%	0,00%	4,55%
e shop for retail sales	45,45%	36,36%	13,64%	0,00%	4,55%
epidemic alerts	45,45%	4,55%	31,82%	9,09%	9,09%
legislation news	45,45%	27,27%	22,73%	0,00%	4,55%
agricultural news	45,45%	18,18%	36,36%	0,00%	0,00%
weather alerts	40,91%	13,64%	36,36%	4,55%	4,55%
new cultivation techniques	40,91%	22,73%	27,27%	4,55%	4,55%
advertising services	36,36%	36,36%	27,27%	0,00%	0,00%
e market for auctioning of goods	36,36%	27,27%	22,73%	13,64%	0,00%
logistics	36,36%	27,27%	18,18%	13,64%	4,55%
transport	36,36%	18,18%	40,91%	4,55%	0,00%
legal services	36,36%	18,18%	40,91%	0,00%	4,55%
insurance services	27,27%	18,18%	40,91%	9,09%	4,55%
e market for purchasing of machinery or production related goods	27,27%	36,36%	31,82%	4,55%	0,00%
technical services	22,73%	27,27%	40,91%	4,55%	4,55%

Table 5.3.F. Results from focus groups for features

Our first finding is that the informative aspect of the platforms along with the commercial options and alerts through notifications are the most sought out features , with very low percentages on negative opinions. The involved stakeholders want a

well organized point of presence on the web, with: i) the option to present their company in a structured way, ii) receive updates through it on legislation and cultivation issues, iii) bulk and retail e-commerce functions and iv) notifications about current issues. Furthermore from advertising services percentages which cumulative on agree and strongly agree reach seventy three percent, we conclude that online promotion is now a common ground for the stakeholders thought as it will be further explained on the qualitative part most are not informed on how to do it.

Our qualitative findings on the topic of current usage of online platforms and mobiles applications for e-trading and e-commerce regarding b2c,b2b and b2g we note a considerable lack of general knowledge regarding such systems. Most remarked they didn't know which are available, how to find them, their usage for both retail and bulk sales, the way it can help them and mostly if they could use them, given their level of technological expertise. Many pointed out security issues like credit card fraud and for e-services and e-marketing, with minor exceptions no one used any platforms or mobile applications though everybody pointed out the importance of facebook and some did use it though not as an official mean.

Regarding corporate web page status and features, some participants had a corporate web page but there was a complete lack of understanding of modern techniques like responsiveness, search engine optimization, W3C or other standards. We should note that they displayed high interest on all relevant issues and on how to obtain them, especially for the verifications as for mobile mobile applications development and functionality, while no one had deployed any, all strongly agreed that they are highly useful especially the notifications system and noted the strong shift towards tablet usage.

An important finding is the impact of e-commerce on the role of local dealers, were most pointed out that there will be a reduction of costs from fewer numbers of parties involved, an expectation for new market penetration as well as brand awareness issues for getting in touch with urban areas and local shops, which can become direct business partners. Participants from both groups agreed that these technologies provide many options on the subject of providing information about complex products, especially regarding certificates gained by chemical or relevant type analysis which can be displayed and promoted as well as combinations with other products, i.e., recipes. Furthermore many noted niche options and that emphasis should be given on the organic products dimension as well as to health issues, i.e.,

blog integration or external site linkage for health advice. Other issues like QR code and relevant info reaching directly the customers were consider as a huge advantage , for linking the production site directly to the consumer and thus gaining a competitive advantage.

On more technical issues like the company's ability to manage inventory or production related procedures, warehouse management optimization, packaging and consulting services were the ones mostly noted as well as purchase of seed or other production related materials on a bulk basis. For online security issues, the groups considered them well established especially due to the recent increased usage of online payment methods, due to the recent restrictions imposed and most think that the consumer aren't reluctant to purchase due to such issues.

Another finding is for customers acquaintance with such mediums, where the consensus was that most middle age or younger consumer know and use such technologies and if it they are tablet friendly most believe that delivery problems and the costs involved may not prohibit the usage. On dissuading factors it was noted that small quantity or the nature of the product may lead consumers to use traditional methods, i.e., fresh fruit. On the other hand all agreed that if the system offered capabilities which reduce the costs for larger quantities it will be used and also that it is highly attractive for products that don't have preservation issues.

The final topic discussed was that of future usage for retail and bulk sales or purchases and e-services and as it was displayed by the questionnaire analysis all were highly positive towards, especially if an e-shop for both retail and bulk was offered, provided that training was in place. Furthermore many services like logistics, marketplaces and especially auctioning, reverse auctioning and notifications for mobile applications to subscribed services are consider highly sought out features and would be extensively used.

6. Conclusions and proposal

The business model we found most commonly used was a mix of informative, advertising and brokerage, that is most platforms offer a variety of services and secure revenues mainly from transaction and advertisement fees. Well established agricultural informative portals that feature frequently updated content, newsletters and strong social media presence, have a devoted and growing user base. This is the foundation on which they are built upon, coupled with clear structure, easy to use interface, weather forecasts and listings of live updated commodities prices that take the form of notification systems for mobile applications. Furthermore users are highly interested for blogs, agricultural techniques material and trust community's views and practices, hence a web based tool should facilitate them, i.e., directories, events calendar, evolved entities lists, useful links sections etc.

Based on this approach e-commerce ties in naturally by providing retail and bulk options for both sales and purchases as well as e-markets for purchase or sales of production related goods. For e-services we conclude that rental of machinery or land as well as integration of third party offers, i.e., logistics, consulting, packaging and legislation news has matured and is a new dimension being deployed by these technologies, bringing in different agribusiness actors from a highly versatile professional background to one place. This incorporation also allows for services fees
, which supplement the fore mentioned revenue methods and are common practice among designers in contrast to subscription oriented models. We must point out though that we found highly specialized solutions, with statistical tools and report generators but only via purchase for both platforms and applications, which adds another dimension on what can be offered with such a versatile tool.

For auctioning services our results are that they are established and developed technologically, though they are not usually integrated into mainstream solutions which points to an opportunity to blend them, into one functioning solution. B2b has known a great rise and will surpass b2c especially in agribusiness and we believe that beyond bulk sales or purchases such options could possibly be integrated into a working solution, though legal and usability issues should be addressed in detail forehand.

Our main result is the fragmentation of provided services and a lack of a holistic approach since we found many different and well designed solutions which are not

incorporated into a one stop shop, as the one we are describing. This lack of concrete investment was more evident in features like low compliance to the well established W3C protocol and in the considerable lack of interest for accessibility issues, where most have at least fifty percent problematic pages. Since most platforms don't offer an accompanying mobile application, we expected they would have invested on responsiveness and the same applies to accessibility if we consider the customer target group.

Mutlilanguage support is in place in most cases, except mobile applications where English is usually the only one offered; but this clearly shows there hasn't been a concrete approach taking into account all features and this is why there is multilanguage support for market expansion, but mediocre effort on the rest. This can also be clearly seen in the low percentage of accompanying mobile applications; the volume of downloads, high ratings and level of sophistication of farm management ones, point to an extended market share which if utilized properly has great potential.

The fore mentioned results from our empirical approach and statistical findings were also verified in the literature review, by publications on specific characteristics of well-established and successful e-marketplaces, i.e., educational material, information oriented portal, weather forecast, blogs, expert advice and farm management. We note that cost reduction techniques in agribusiness were found many times throughout literature and are considered as successful practices, mostly by facilitating search capabilities, monitoring negotiations, increasing price information availability, reduction of intermediates, and decreasing of marketing costs.

These findings are solidified by the structured questionnaires, interviews and focus groups which covered youth entrepreneurship as well as established professionals. Our main result from the questionnaires for future usage of all types of sales, purchases and services, is that at least half would use a web based platform and on average thirty percent would use a mobile application. Furthermore fifty nine percent would use a web based platform for e-marketing and seventy four a mobile one, while even stronger evidence was found during the interviews and focus groups. These tools were mentioned as highly sought out and percentages for strongly agree ranged from fifty three up to seventy six percent for the platforms and forty six up to seventy six percent for the mobile applications.

For specific requirements our results tie in closely with the rest of our results regarding informative nature, b2b and b2c options etc., as it can be seen in the

following table, where we gathered only the strongly agree answers from all three different target group approaches.

Features					
Questionnaires	Strongly agree	Interviews	Strongly agree	Focus groups	Strongly agree
information about your company	39%	information about your company	84,62%	information about your company	59,09%
agricultural news	38%	customer feedback	84,62%	e shop for bulk sales	50,00%
legislation news	36%	advertising services	69,23%	e shop for retail sales	45,45%
weather alerts	33%	government related information	53,85%	epidemic alerts	45,45%
epidemic alerts	31%	weather alerts	53,85%	legislation news	45,45%
e shop for retail sales	30%	administrative information	53,85%	agricultural news	45,45%
new cultivation techniques	30%	business news	53,85%	weather alerts	40,91%
e shop for bulk sales	29%	technical services	53,85%	new cultivation techniques	40,91%
e market for purchasing of machinery or production related goods	29%	legal services	53,85%		
advertising services	28%	logistics	46,15%		
legal services	27%				

Table 6.A. Results from questionnaires, interviews and focus groups for features on strongly agree scale

These results point to a well developed understanding for the usefulness of these tools and the main characteristics a platform or a mobile application should have if it is to be attractive to users. Digital marketing tools should also be available since younger users are already acquainted with them and by in large use them and regarding their requirements, there is a clear preference for search engine optimizations techniques followed by SMS marketing.

This format was also found in literature review where extensive usage of mobile technologies was reported, due to their simplicity, intuitiveness, medium to lost cost and mostly due to the fact that they can be used for browsing even with poor internet coverage, which is the case for most rural regions especially in Greece. Given our literature findings from national data, where: i) reports of ninety three point six percent usage for promoting of products by providing information, ii) eighty five

percent support customer communications and iii) by the corresponding results from the questionnaires, we believe that they should be integrated into the available tools.

Our results for the views of Greek users from all target groups regarding the impact these tools will have on business aspects, are that they strongly believe in their usefulness, as it can been seen in the following table, where we gathered results only the strongly agree opinion.

Interviews							
Business aspect	Strongly Agree	Business aspect	Strongly Agree	Business aspect	Strongly Agree	Business aspect	Strongly Agree
Fast communication with customers	84,62%	Faster discovery of customer needs	69,23%	Brand engagement	53,85%	Increased brand equity or /and brand awareness	61,54%
New Sales	76,92%	Increased market share	69,23%	Reduction of sales costs	61,54%		
New Customers	76,92%	Increased profits	69,23%	Faster adaptability of customer needs	61,54%		
Increased customer satisfaction	69,23%	Greater customization of products	61,54%	Good customer relationships	61,54%		
Students							
Business aspect	Strongly Agree	Business aspect	Strongly Agree	Business aspect	Strongly Agree	Business aspect	Strongly Agree
Better feedback from the customers	45,45%	Developing new products	43,64%	Reduction of sales costs	37,27%	Greater customization of products	25,45%
Fast communication with customers	43,64%	New markets	33,64%	Increased brand equity or /and brand awareness	30,91%	Increased market share	22,73%

Table 6.B. Results from questionnaires, interviews and focus groups for features on strongly agree scale

These results verify our literature findings for the importance and prospects of niche markets for start up and smaller businesses and given the percentages for greater customization of products and developing new products questions, we believe that a need for incorporating such e-services has come forth.

We believe that such a tool must be designed with modern software technologies, using well established verifications allowing for modularity, responsiveness and modern aesthetics that can meet the high standards we found and are expected by

users. Multi layered e-commerce, digital marketing and e-trading tools tools along with educational videos, tutorials and accompanying text in digital format will further strengthen user loyalty and will also enhance the community aspect, which can be enlarged by forums and shared calendars for events, acting as another revenue methods.

We believe that this endeavor should be done in conjunction with organizations that have close ties to rural regions and agricultural stakeholders, which must emphasize on non technological aspects. We consider this dimension of the proposal as an integral part, for the following reasons:

- Feedback for the functionality and aesthetics, can lead to a practical tool optimized for the Greek agricultural community needs. We consider this aspect of high importance, since if a tool doesn't provide the functionality a target group wants or does so but in a way that it is not comprehensible it will not be used. On this aspect user feedback can give valuable insights on potential alterations or suggestions for new features, which otherwise would not be easily found, since it's improbable that a user non acquainted with technology will inform for such features, by other means.
- Training for usage of this tool should be consistent, thorough and accompanied by rich educational material which must be comprehensible to the end user, else it will not be used. We believe that personnel acquainted and in permanent contact with rural Greece must be heavily involved in all these, since they have hands on experience and personal or professional relationships with the stakeholders.
- Promotion beyond traditional and digital media should be facilitated by a agribusiness hub with strong and current connections to the agricultural community, since most stakeholders involved in agriculture in Greece are informed for such tools and their usefulness, by traditional channels at this point.
- Unions and associations are known to play a strong role in Greek agricultural community and act as a informative hub, thus organizations closely linked with them can help on organizing focus groups and seminars

We propose collaboration with GAIA EPIHERIN, which has more 700.000 registered users and 348.000 subscriptions, excellent on site presence through Greece, strong ties and every day communication with Greek rural community; but also already provides

training and consulting services to unions and associations among a rich portfolio of agribusiness oriented services.

The platform and mobile applications we are proposing, meets our findings for the needs and requirements from all aspects of our review and at this point we display a fully developed modular design, with thorough explanation and drafts. The design includes the entities involved in the system, the added value produced, their functionality, interaction and a per unit explanation of what each could do. Regarding entities, we distinguish the following categories:

- Farmers
- Cooperatives
- Agricultural unions
- Special scientists
- Brokers / Retailers / Wholesalers
- Retail stores
- Ministry of Trade Agriculture
- Private & public consulting firms
- Press & publications
- Agribusiness educational institutes
- Agricultural development & research operations
- Financial institutions
- Logistics Service Providers
- Libraries / Statistical services
- Individuals / Buyers

For the value added activities in agribusiness portal, we distinguish the following categories, functionality and interactions (presented in italics) :

- Information search and dissemination: Agricultural events, exhibitions, conferences, news related web sites, finding help, newsletters, announcements, e-libraries, articles, online data banks, calendar listings, best practices, farm software, links (*Direct, on-time, fast information gathering, respond to individual requirements, wide range of information).*
- Communication – Discussions: e-mail, discussion gr oups, discussion forum, chats (*Speed of communication, interactivity, low cost).*

- Education and

" training: Announcements, training programs, courses *(adjusted to the user's requirements, computer based training via the Internet, low cost, unconstrained by time and location).*

- Consulting services: Public and private organizations, internet services, agribusiness marketing and logistics services (*Direct access, according to individual requirements).*
- E-agents, e-brokers, e-marketplaces, e-auctions: Electronic intermediaries undertaking particular stages of agribusiness transactions (*Specialization, synergy, strategic options).*
- E-Business: Internet Service Providers, Application Service Providers, customer and market e-research, web site development and maintenance for online advertising and logistics operations:

  corporate-product-service
  promotion online pricing catalog
  online advertising
  online exchanges (orders, reservations) e-payments, e-procurement, e-services success measurement
  Low cost, flexibility, transactions unconstrained by time and location, interactivity, individualization, one-to-one marketing model

In the next four pages we present the model design of the system along with drafts for the online platform and mobile application that could facilitate the above and in the last part of our proposal we include our analysis, for ther the subcomponents and their functionality.

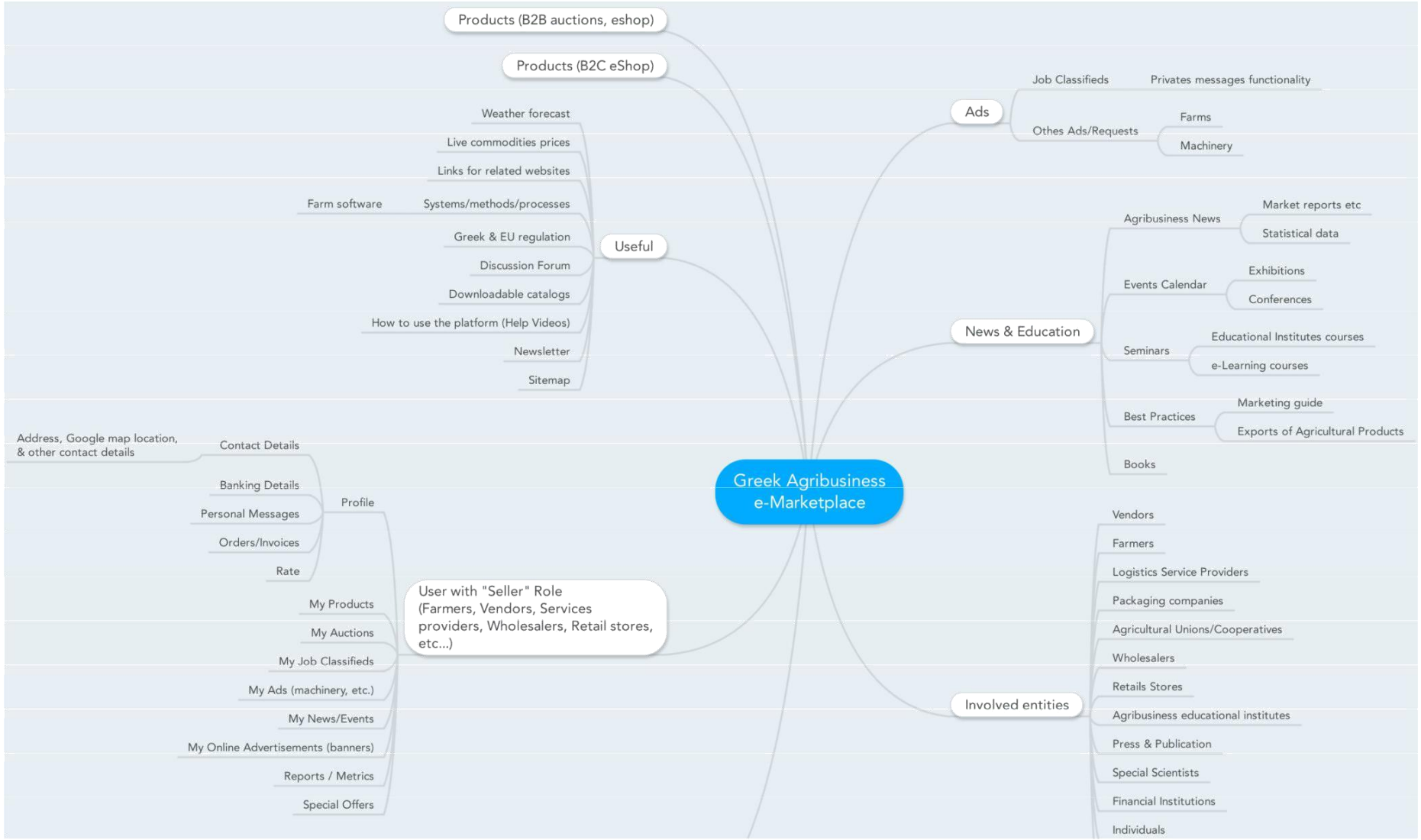
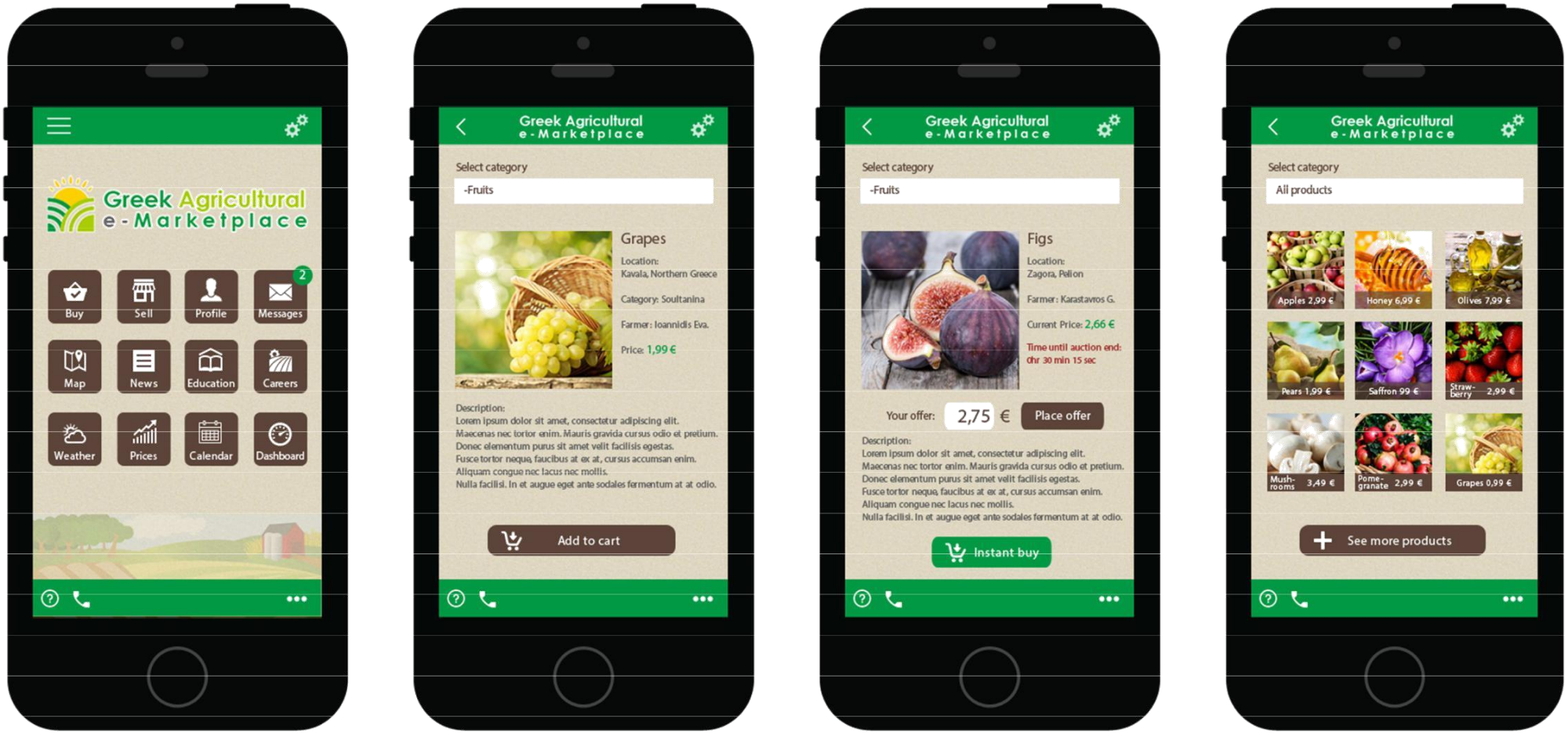
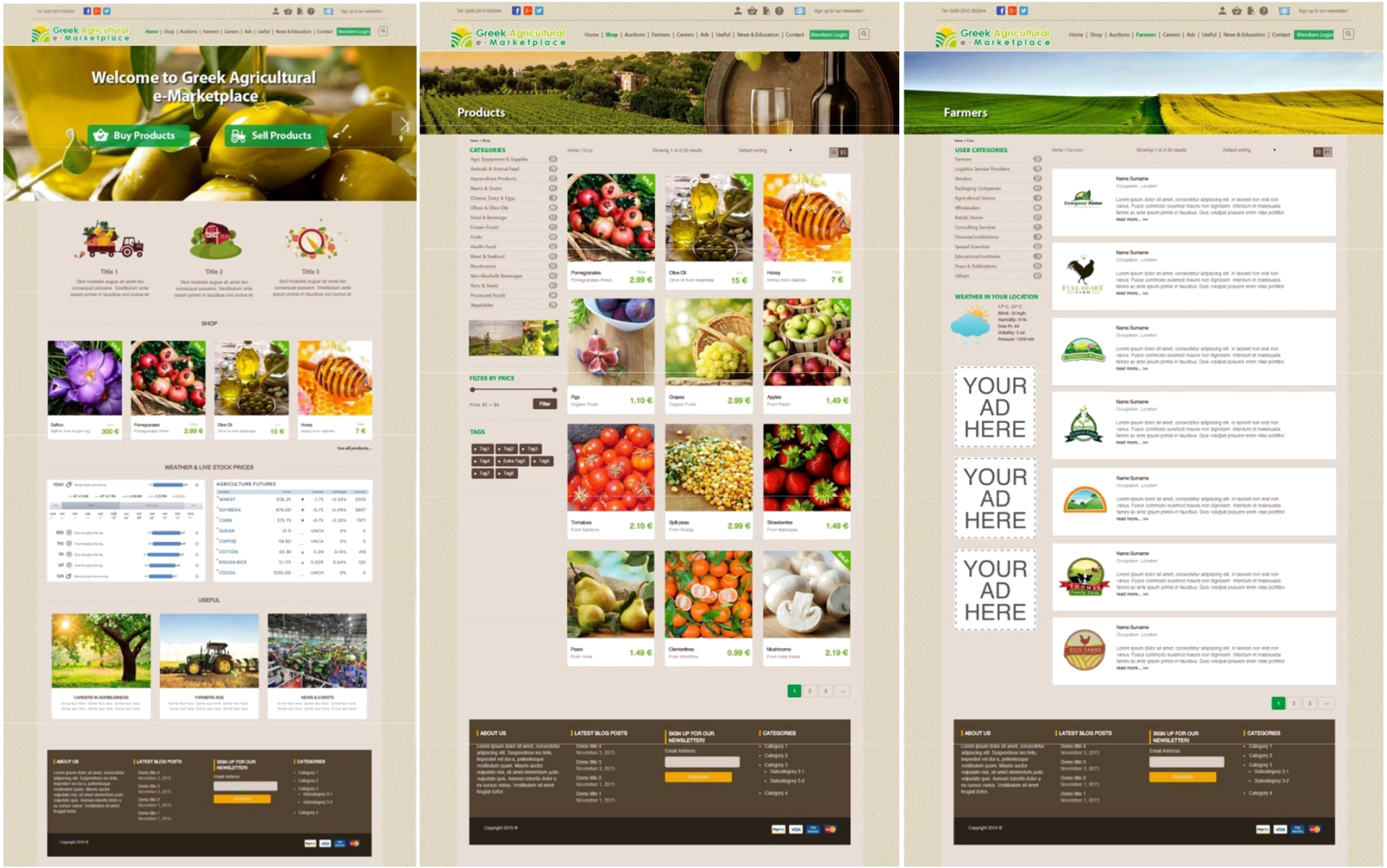


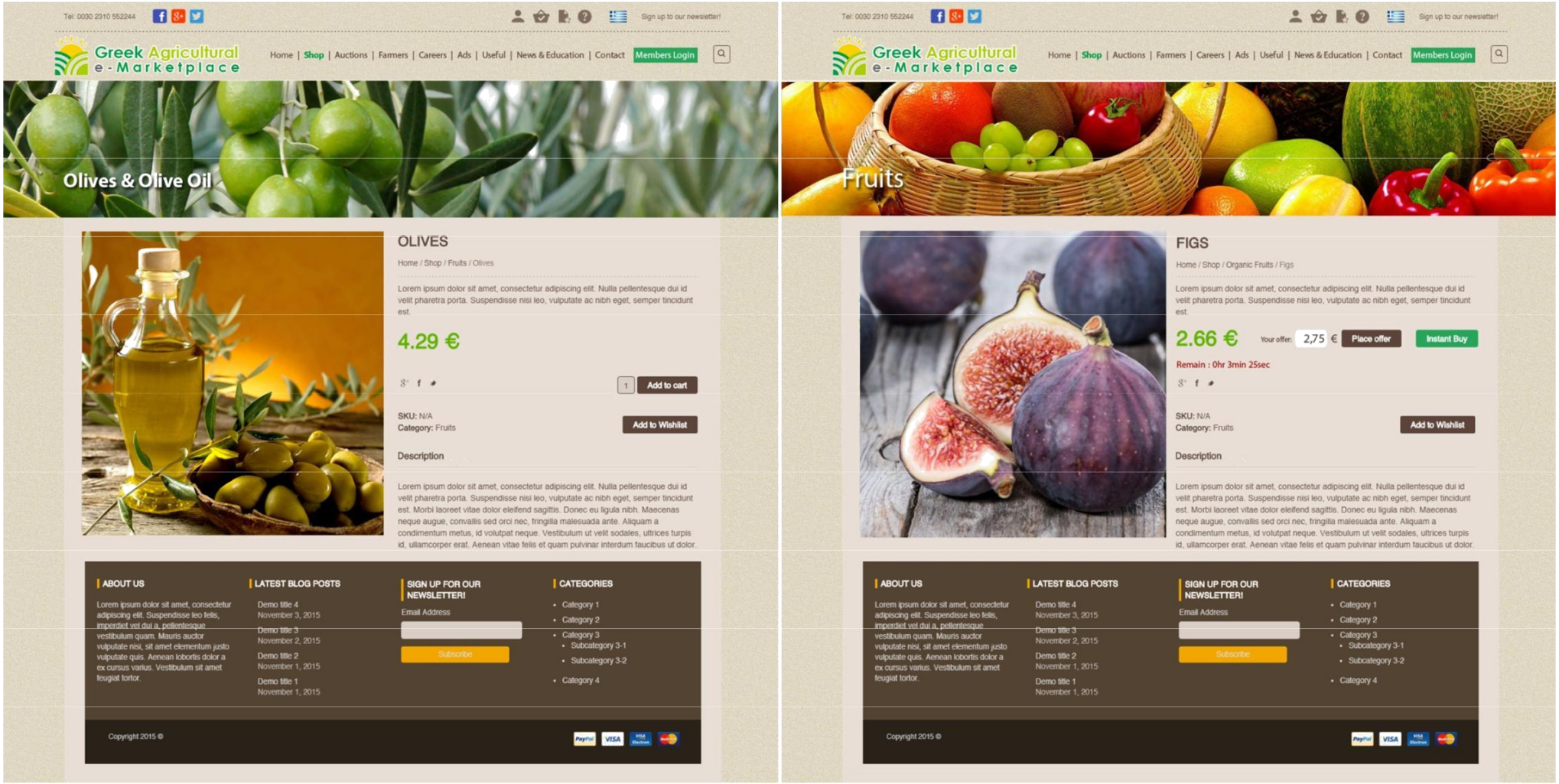
Figure 6.A. Model for the design of agribusiness system



Figures 6.B. Draft models for mobile applications on iOS



Figures 6.C. Draft models for online platform – hom e, catalog and e-services pages



Figures 6.D. Draft models for online platform – pro duct pages

At this point we analyze the entities and functionalities as displayed on the system design, on which the drafts where based upon:

- Users: The basic entity in the platform is the registered User, who has access to the e-platforms services, according to their roles. The platform design supports the following user roles:

  Sellers: The seller is every registered User that has sales as a primary activity and it will consist of much sub-types, i.e., farmers, vendors, service providers, wholesalers and retail stores.

  Byers: Byer is a registered user that as his primary activity is to buy goods and it will consist of many sub-types like :

  - Farmers,
  - Vendors,
  - Service Providers,
  - Wholesellers,
  - Retail Stores, etc.

For each user role the system will store necessary information that will be available and stored for each Seller including the following:

- Profile: Basic information about the seller
  - Contact details: Details on how to contact the seller
  - Banking details: ISBN, PayPal or other related information
  - I; Messages to facilitate the communication between the seller and the end user - consumer more personal.
  - Orders/Invoices: A list of the orders and invoices for every sell that was processed by the seller.
  - Rate: Every user will have the ability to rate the seller according to how the seller handled the puchase and the feedback he offered.
- MyProducts: The seller will have the ability to view the products he is offering through the platform, and information about each one.
- MyAuctions: The seller will be able to initiate auctions or reverse auctions about products or services he offers.

- MyAds: A seller can overview ads about his products and this section will include ads that the seller is following.
- MyNews/Events: In this section the seller will add and overview news and also create and view events that he organizes or participates.
- Reports/Metrics: This section functions as a dashboard, with overview of the products, orders and total income from the platform. Furthermore it will also provide information on the number of users that have visited and viewed the sellers profile, etc.
- Special offers: Users can define some products as special offers, special prices

etc. For the Buyer entity the platform will save the following information:

- Profile: Details about the Buyer. The profile information also include o Orders/Invoices,
  o Personal Messages exchanged between registered users in the system o Rate
- Add To Cart: Information about the products he has already added to his cart.

It's important to mention here that the registered user Entity could belong to both roles, as it is possible for a Seller to also buy products or services.

Usefull Services: The e-marketing platform will also offer services that will be available regardless of the log in procudere, featuring the following:

- Weather Forecast: Weather forecast, historical data and localized alerts
- Live comodity prices,
- Links for related websites
- Farm Software: (Write here what you had in mind)
- Greek and EU regulations: What are the latest regulations, regarding tax and finance, crops, etc.
- Discussion forum: Forum where people with expertise could offer help and advice
- Downloadable Catalog: Users can download catalog of farmers filtered by specific product, which they can store locally.
- Help Videos: Instructional Videos on how to use the platform.

- Newsletter: Users could sign to get frequent e-mail throught their e-mails on the latest news about agriculture.
- Sitemap: For easier navigation

- B2C (e-shop): This is one of the basic services that the platform will offer and users will be able to view and buy products that registered users (Sellers) offer. The platform will offer the option to filter per product, per farmer, per price etc, search per product category or per farmer etc. The buyer can use the B2C service to rate the seller and also comment the products.

- B2B (auctions, eshop): This B2B service extends b2c capabilities to all agribusiness aspects and allows sales and purchaces of bulk goods and machinery

- Ads: E-marketing platform will offer the ability to registered users, to add Ads on the system about jobs, requesting for working hands for speicific period of times, defining pay rate, etc. The registered users will be able to add ads selling or requesting machinery, to buy or to rent and they will be available to both registered and non registered users.

- News and Education: One of the services that our platform will offer is a section with news and education and it will include the following:
  - Agribuinsess News: News related to agribuisness, makret reports, statistical data and more.
  - Exhibitions/Conferences: News about the latest exhibitions (new products, machinery etc), or conferences.
  - Seminars: This could include educational courses held at universities, open courses, or e-learning courses.
  - Best practises: Best pratices on planting on using pesticides etc. o Books.

- Data Mining - Automated Recomanedation System : Data Mining is be a service that will provide the ability for personalized advertisment offers and recomendations to consumers, based on their search terms and purhcases.

7. Appendix

7.A. Workshop agenda worksheet

Workshop Purpose		
The purpose of this workshop is to identify best practices in e-commerce solutions and mobile applications development that have already been successfully used, on a national or an international level		
Workshop timetable and location		
Location American Farm School – Perrotis College	Date 06/11/2015	Time 19:00 – 20:00 & 20:00 – 21:00
Workshop activities (Described analytically in the subsequent table)		
1. Introduction		
2. Current status 3. e-commerce and online sales obstacles 4. Incorporation 5. Questionnaire on e-service to be handed out after the conclusion of the workshop		

7.B. Workshop activites

Step A: Introduction

Estimated time	5 minutes
Purpose	Introduction
Process Steps	1. Introduce workshop coordinator and documenter 2. Brief overview of the Niarchos initiative 3. Brief overview of E-Commerce Opportunities and Challenges for Start-Up agribusinesses

Step B: Current status

Estimated time	25 minutes
Purpose	Current status of online and mobile technologies usage
Process Steps	1. Current usage of online platforms and mobiles applications for e-trading and e-commerce regarding B2B, B2C, B2G 2. Current usage of online platforms and mobiles applications for e-services and e-marketing , i.e., email marketing (newsletters) , video marketing (youtube), SMS marketing, social media and

	search enging promotion 3. Corporate web page status and features like: Functionality , i.e., informative , customer relationship ,on line sales Renewability , i.e., frequency and roles Supported languages , responsiveness and disabilities support 4. Mobile applications development and functionality, i.e., multi platform support, informative, online sales , member sections

Step C: e-commerce and online sales obstacles

Estimated time	15 minutes
Purpose	Views on the impact of e-commerce and problems customers face
Process Steps	1. Effects of e-commerce on the role of local dealers 2. Easier to provide information about complex products 3. Company's ability to manage inventory or production related procedures 4. Online security issues 5. Target groups acquaintance 6. Delivery problems , i.e., cost, time , insurance issues, logistics

Step D: Incorporation

Estimated time	15 minutes
Purpose	Views on adopting and using technologies in the future
Process Steps	1. Future usage for retail and bulk sales or purchases and e-services

7.C. Workshop questionnaire on e-services features

From the following features please circle the number that reflects to what extent it would be useful to you, if they were offered by a web based platform or a mobile application dedicated to e trading or e services.

Features	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
information about your company	1	2	3	4	5
e shop for retail sales	1	2	3	4	5
e shop for bulk sales	1	2	3	4	5
e market for purchasing of machinery or production related goods	1	2	3	4	5
e market for auctioning of goods	1	2	3	4	5
weather alerts	1	2	3	4	5
epidemic alerts	1	2	3	4	5
new cultivation techniques	1	2	3	4	5
legislation news	1	2	3	4	5
agricultural news	1	2	3	4	5
logistics	1	2	3	4	5
transport	1	2	3	4	5
insurance services	1	2	3	4	5
advertising services	1	2	3	4	5
technical services	1	2	3	4	5
legal services	1	2	3	4	5
Other (Fill in)					

7.D. Analytical stakeholder profile sheet – Focus g roups and interviews

	Surname	Name	Field of expertise
1	Georgiou	Eirinaios	Agribusiness - AFS
2	Mpourgoutzoglou	Eirini	Food science technologist
3	Karazisi	Natalia	Freelancer agribusiness
4	Doumpri	Maria	Agribusiness
5	Simeonidis	Klimis	Agribusiness
6	Thoma	Vasiliki	Agribusiness
7	Mirvanis	Konstantinos	Food sector
8	Ioannidou	Sofia	Education
9	Emmanoulidou	Maria	AFS – agribusiness
10	Konstantinidou	Melpomeni	Freelancer agribusiness
11	Skordeli	Eleni	Freelancer agribusiness
12	Boudouri	Anastasia	Agribusiness
13	Mpakalis	Christos	AFS – agribusiness
14	Roupa	Antonia	Ministry of Tourism
15	Kioumourtzi	Kuriaki	Ministry of Tourism
16	Papagianis	Ioannis	Livestock
17	Kavakis	Dimitris	Economics
18	Lisoudi	Katerina	Freelancer agribusiness
19	Moisidais	Antonis	Food science technologist
20	Gavrilidou	Meropi	Biologist
21	Varvouti	Mairy	Lawyer
22	Grigoriou	Xrysa	Freelancer agribusiness
23	Remountos	Panagiotis	Agrobusiness platform designer
24	Apostoloudis	Panagiotis	Olive oil standardization
25	Apostolos	Ioannis	Livestock
26	Mpanaxaris	Stelios	Farmer – standardization
27	Stathis	Andrea	Livestock
28	Papathanasiou	Iasonas	Farmer – Horticulture
29	Kapnidis	George	Beekeeping
30	Vadarlis	George	Livestock
31	Petkos	Maria	Farmer
32	Tsitiridis	Nickos	Marmelade producer
33	Kontodimas	Dimitrios	Agrotourism – café
34	Granouzis	Iwannhs	Agrotourism
35	Zevgara	Georgia	Aiolides - Agrotourism
36	Georgakopoulos	Iwannis	Agrotourism
37	Palmou	Eleni	Oreiades Suites - Agrotourism
38	Frantzeskakis	Nikos	Agrotourism
39	Benardis	George	Agrotourism
30	Iatridis	Aggelos	Wine industry
41	Theodorakelis	George	Agrotourism
42	Grigoriou	Xrysa	Hotel owner
43	Naoumidis	Petros	Process Factory
44	Mpliaraki	Korina	Culture
45	Kalezhis	Stelios	Agrotourism

7.E. Workshop Process checklist and remarks worksheet – First and second group findings

Step A: Introduction

Estimated time	5 minutes
Purpose	Introduction
Process Steps Status Completed for both groups	1. Introduce workshop coordinator and topic Remarks
Status Completed for both groups	2. Brief overview of the Niarchos initiative Remarks There were questions about the scope and aim of the project, the timetable in total and of the study in particular as well as the involved stakeholders.
Status Completed for both groups	3. Brief overview of E-Commerce Opportunities and Challenges for Start-Up Agribusinesses Remarks

Step B: Current status

Estimated time	25 minutes
Purpose	Current status of online and mobile technologies usage
Process Steps Status Completed for both groups	1. Current usage of online platforms and mobiles applications for e-trading and e-commerce regarding B2B, B2C, B2G Remarks Lack of general knowledge regarding such systems was widely noted , that is if they are available, how to find them, their usage for both retail and bulk sales, in which ways it can help them and how feasible is it for them to use, given their level of technological expertise.

Status Completed for both groups	2. Current usage of online platforms and mobiles applications for e-services and e-marketing , i.e., email marketing (newsletters) , video marketing (youtube), SMS marketing, social media and search enging promotion Remarks With minor exceptions no one used such platforms or mobile applications though everybody pointed out the importance of facebook and some did use it though not as an official marketing tool.
Status Completed for both groups	3. Corporate web page status and features like: Functionality , i.e., informative , customer relationship ,on line sales Renewability , i.e., frequency and roles Supported languages , responsiveness and disabilities support
Status Completed for both groups	Remarks Two participants had a corporate web page but there was a complete lack of understanding of modern techniques like responsiveness, search engine optimization, social media etc, W3C or other standards and interest was displayed by all, on relevant issues and on how to obtain them.
Status Completed for both groups	4. Mobile applications development and functionality, i.e., multi platform support, informative, online sales , member sections Remarks No one used any but all strongly agreed that they are highly useful especially the notifications system and that there is a huge shift towards tablet usage.

Step C: e-commerce and online sales obstacles

Estimated time	15 minutes
Purpose	Views on the impact of e-commerce and problems customers face
Status Completed for both groups	1. Effects of e-commerce on the role of local dealers Remarks Reduction of costs from less number of involved entities and new market penetration were the most mentioned features as well as brand awareness issues; this notion further expanded to getting in touch with urban areas and local shops for direct business partnership.
Status Completed for both groups	2. Easier to provide information about complex products Remarks Groups agreed on the easiness these technologies provide, especially for chemical or other analysis certificates which can be displayed and promoted; combinations with other products, e.g., recipes and that emphasis should be given on the organic products dimension as well as to health issues , i.e., blog integration or external site linkage for health advice. Issues like QR code and direct marketing are considered to offer a competitive advantage, since they directly link the production site to the consumer
Status Completed for both groups	3. Company's ability to manage inventory or production related procedures Remarks Warehouse management optimization and packaging consulting services were the ones mostly noted as well as purchase of seed or other production related materials on a bulk basis
Status Completed for both groups	4. Online security issues Remarks The groups considered the issues well established especially to the recent increased usage given the banking system restrictions involved and most think that their consumers aren't reluctant.

	5. Target groups acquaintance
Status Completed for both groups	Remarks The consensus was that most middle age or younger consumer are acquainted with the relevant technologies and it would be easy for them to use especially if it was tablet friendly.
	6. Delivery problems , i.e., cost, time , insurance issues, logistics
Status Completed for both groups	Remarks Most believe that the costs involved may prohibit the usage in such systems in cases where the quantity is small or the nature of the product is such, that the consumer will probably use traditional methods, e.g., fresh fruit. On the other hand all agreed that they would use the system, if it offered options for cost reduction regarding bulk and that it is highly attractive for products that don't have preservation issues.

Step D: Incorporation

Estimated time	15 minutes
Purpose	Views on adopting and using technologies in the future
Process Steps Status Completed for both groups	1. Future usage for retail and bulk sales or purchases and e-services Remarks As it can be verified by the questionnaire analysis all were highly positive towards using online platforms and mobile applications, especially if e-shop for both retail and bulk capabilities was offered, provided that training was available. Furthermore many services like logistics, marketplaces, auctioning, reverse auctioning and notifications for mobile applications to subscribed services are consider highly sought out features and would be extensively used.

7.F. Questionnaires

Background data about the Enterprise

Study No & title:	Researcher/s:	Date:
Company title:		Business Type:
Address:		www.
Contact person:	Mobile: e-mail:	GPS location N E
Main activity sector: B2B ☐ B2C ☐ B2G ☐		Other activities:
Year of establishment:	Management & ownership:	
Annual turnover: o Up to 200.000 o 201.000 – 400.000 o 401.000 – 600.000 o 601.000 – 800.000 o 801.000 – 1.000.000 o 1.000.001 and over		
Level of activity: local/ regional ☐ national ☐ exporter ☐ importer ☐ If exporter, main markets:		
If importer, national origin of main imports:		
In Greece, main geographical markets:		
Short company history/ researcher notes:		
Insert photos		

Part A: Web tools and mobile applications

The following questions are about your web site, on how you use it, update it and its features and also about mobile applications and hardware infrastructure.

1. Do you have a website? (you can select more than one)
   a. We don't have a company web site
   b. We have a website and we use it for (you can select more than one) :
      1. Information regarding products and services
      2. Customer feedback
      3. Online sales options
   c. We have a website and we update the content :
      1. On a daily basis
      2. Once per week
      3. Once per two or three weeks
      4. Once per month or more
      5. We don't update it
   d. Who updates the content (you can select more than one)?
      1. I update the content myself
      2. An employee updates the content
      3. An external collaborator updates the content
      4. We don't update it
   e. It is optimized for mobile browsing
   f. It is multilingual (more than three languages)
   g. It is friendly to people with disabilities
   h. It was develop by :
      1. Our company
      2. An external collaborator
2. Do you use a Smartphone or tablet?

a. Yes b. No

3. Have you developed a mobile application (you can select more than one)?
   a. No
   b. No but we are planning to develop one
   c. Yes and it is deployed on the following platforms :
      1. iOS
      2. Android
      3. Windows mobile
      4. All the above
   d. Yes and it features the following functions :
      1. Online sales options
      2. Company features
      3. Members section

Part B: e-trading and e-services needs and requirements

The following questions are on e-trading that is purchases and sells, retail or bulk of goods or production related products. It can be done on: i) a B2C (Business to Consumer) basis for direct sales to the consumer, ii) B2B (Business to Business) for bulk sales from one company to the other or purchase of production related goods from suppliers and iii) B2G (Business to Government) for your government related issues. Furthermore we include questions on e-services, i.e., logistics, legal advice etc and that can be offered via the web.

4. Do you use any web based platform for e-trading and if yes how you would rate the quality of services?

a. Don't use one b. I use one but I am not satisfied c. I use one and I am satisfied

5. Do you use a mobile application for e-trading and if yes how you would rate the quality of services?

a. Don't use one b. I use one but I am not satisfied c. I use one and I am satisfied

6. Do you use any web based platform for e-services and if yes how you would rate the quality of services?

a. Don't use one b. I use one but I am not satisfied c. I use one and I am satisfied

7. Do you use a mobile application for e-services and if yes how you would rate the quality of services?

a. Don't use one b. I use one but I am not satisfied c. I use one and I am satisfied

8. Regarding retail sales of your products (you can select more than one)?
   a. I would use a web based platform
   b. I would use a mobile application
   c. I wouldn't use any of the above

9. Regarding bulk sales of your products (you can select more than one)?
   a. I would use a web based platform
   b. I would use a mobile application
   c. I wouldn't use any of the above

10. Regarding purchasing of production related goods from your suppliers, i.e. machinery or seeds (you can select more than one)?
   a. I would use a web based platform
   b. I would use a mobile application
   c. I wouldn't use any of the above

11. Regarding e-services (you can select more than one)?
   a. I would use a web based platform
   b. I would use a mobile application
   c. I wouldn't use any of the above

12. From the following features please circle the number that reflects to what extent it would be useful to you if it was offered by an web based platform or mobile application dedicated to e trading or e services.

Features	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. information about your company	1	2	3	4	5
b. e shop for retail sales	1	2	3	4	5
c. e shop for bulk sales	1	2	3	4	5
d. e market for purchasing of machinery or production related goods	1	2	3	4	5
e. e market for auctioning of goods	1	2	3	4	5
f. weather alerts	1	2	3	4	5
g. epidemic alerts	1	2	3	4	5
h. new cultivation techniques	1	2	3	4	5
i. legislation news	1	2	3	4	5
j. agricultural news	1	2	3	4	5
k. logistics	1	2	3	4	5
l. transport	1	2	3	4	5
m. insurance services	1	2	3	4	5
n. advertising services	1	2	3	4	5
o. technical services	1	2	3	4	5
p. legal services	1	2	3	4	5
Other (Fill in)					

Part C: e-marketing needs and requirements

13. Select the e-marketing tools you use if any (you can use more than one) :
    a. Email marketing (Newsletters)
    b. Video marketing
    c. SMS marketing
    d. Social media marketing
    e. Search engine optimization campaigns
    f. Don't use them

14. Do you use any web based platform for e-marketing and if yes how you would rate the quality of services?

a. Don't use one b. I use one but I am not satisfied c. I use one and I am satisfied

15. Do you use a mobile application for e-marketing and if yes how you would rate the quality of services?

a. Don't use one b. I use one but I am not satisfied c. I use one and I am satisfied

16. From the following features please circle the number that reflects to what extent you think you would need from a web based platform or mobile application oriented to e-marketing

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Email marketing (Newsletters)	1	2	3	4	5
b. Video marketing	1	2	3	4	5
c. SMS marketing	1	2	3	4	5
d. Social media marketing	1	2	3	4	5
e. Search engine optimization campaigns	1	2	3	4	5

17. From the following features please circle the number that reflects to what extent it would be useful to you if it was offered by an web based platform or mobile application oriented to e-marketing

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Increased market share	1	2	3	4	5
b. Increased brand equity or /and brand awareness	1	2	3	4	5
c. New markets	1	2	3	4	5
d. Greater customization of products	1	2	3	4	5
e. Fast communication with customers	1	2	3	4	5
f. Better feedback from the customers	1	2	3	4	5
g. Developing new products	1	2	3	4	5
h. Reduction of sales costs	1	2	3	4	5

Part D: Problems and obstacles with online agribusiness

18. Circle the number which reflects what you believe it's likely to dissuade your customers from buying on-line

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
a. Difficulty to evaluate the quality of the product	1	2	3	4	5
b. Delivery problems	1	2	3	4	5
c. Delivery costs	1	2	3	4	5
d. Apprehension of personal data protection	1	2	3	4	5
e. Lack of choice of services or products on-line	1	2	3	4	5
f. Lack of knowledge	1	2	3	4	5
g. Preference for direct purchasing in shops	1	2	3	4	5
Other (Fill in)					

Part E: e-commerce

Please circle the number that reflects your opinion on e-commerce

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
19. It will greatly reduce the role of local dealers in your industry in the next years	1	2	3	4	5
20. It will be easier to provide information about complex products	1	2	3	4	5
21. It will improve your company's ability to manage inventory or production related procedures	1	2	3	4	5
22. The type of your products affects you positively in adopting them	1	2	3	4	5
23. The size of your enterprise affects you positively in adopting them	1	2	3	4	5
24. There are government influences or incentives to adopt them	1	2	3	4	5

7.G. Geographical distribution of students

Students geographical distribution							
Origin	Count	Origin	Count	Origin	Count	Origin	Count
Agios Athanasios	1	Grevena	1	Limnos	1	Serres	3
Agrinio	1	Heraklio	1	Makrychori	1	Skiathos	1
Amfissa	1	Ioannina	1	Messinia	1	Skydra	2
Amman	1	Itea	2	N. Moudania	1	Thermi	1
Argolidas	1	Kalavryta	1	N.Alikarnasos	1	Thessaloniki	23
Athens	7	Karditsa	2	Naoussa	1	Tychero Evrou	1
Chalikidiki	1	Kastoria	1	Nea Moudania	1	Tyrnavos	1
Chalkidiki	2	Katerini	2	Oinofyta	1	Veroia	3
Chalkidiki	2	Kavala	3	Orestiada	1	Voiotia	1
Corfu	3	Kilkis	1	Paramythia	1	Volos	1
Crete	2	Komotini	1	Patra	1	Vonitsa	1
Cyprus	1	Koropi	1	Pefka	1	Xanthi	1
Farsala	1	Kosovo	2	Perea	1	Studies Abroad	2
Florina	1	Lagyna	1	Preveza	1		
FYROM	5	Larisa	4	Rhodes	1		
Statistics							
Greece urban							30
Greece rural							73
Abroad							7
Total							110

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