

The Web Presence of Greek Food Firms

George Chrysochoidis and Peter Blouchos*

Abstract

The World Wide Web is still a new technology. In higher internationalization sectors, firms are not only expected to adopt new technologies quickly, but also do so in a simultaneous manner across countries. Nonetheless, the food industry is a lower internationalization sector, meaning that adoption of new technologies (such as the web) may be taking place at a slower pace. We check the overall hypothesis that the Greek food firms are lagging behind their counterparts in other Western countries with respect to their web presence. We investigate this hypothesis by comparing and contrasting the functionality, usability, efficiency and reliability of the web sites of 119 food and 56 beverage Greek and 98 overseas food companies. Our hypothesis is confirmed.

Introduction

According to Gladding (2001) the number of www users in Europe doubled between the years 1999 and 2001 forecasting an equally incremental growth for the next three years. This growth has led an increasing number of companies to the decision to endeavour with the new medium and develop an internet presence (Berthon et al., 1996). Nonetheless, this may not happen at an evenly and simultaneous manner across all sectors because of industry characteristics (Mahajan et al., 1990), such as the degree of sector internationalization. The food sector is considered of low internationalization and, as a consequence, food firms may not decide to adopt equally quickly new technologies in their business (Kobrin, 1991; Porter, 1986). Thus, food companies may not adopt web technologies simultaneously across countries and may exhibit different degrees of sophistication and quality presence in the web (Dekimpe et al., 2000; Gladding, 2001). The objective of this article is to examine whether food companies residing in different countries possess different web presence profiles of their web sites. In doing so, we compare the web presence of food firms using four specific criteria in two clearly different geographical areas (Greece and overseas).

Theoretical framework and hypotheses

Diffusion is defined as the adoption of innovations “during the time between the members of a social system” (Rogers, 1983). Firms are members of a social system,

* Address for correspondence: Dr George Chrysochoidis, Iera Agricultural University of Athens (Greece), Odos 75, Athens, GR-11855, Votanikos, Greece, Tel/Fax: +30-210-5294766, email: gc@aua.gr

and, as such, they seem to adopt innovations in stages and according to the time at which they do so, they are divided into innovators, early adopters, early majority, late majority and laggards. Countries being more mature regarding www penetration and use (USA, Canada, Japan) appear to have a larger number of, and higher quality, company web sites when compared to other countries (Jimenez-Martinez and Polo-Redondo, 1998). The mature North American countries are closely followed by Northern European countries, but Southern European countries (like Greece) do lag behind (Gladding, 2001). The usual path regarding the adoption of web technology is that companies first experiment with the new means by building a simpler web site before moving on to a higher complexity, sophistication and quality web site in a more conscious attempt to allure their customers to (Hart and Doherty, 2000; Lynn et al., 2002): (a) visit and stay long in the web site; (b) explore the web sites and interact with it; and (c) buy products and services through the firm's web site.

Company web sites must not only attract visitors, but convert those visitors into possible buyers and then into faithful customers that revisit the firm's web site often and repeat purchases (Berthon et al., 1996). The complexity, sophistication and quality of a web site can be assessed on the basis of its (Bauer and Schral, 2000): (a) functionality, (b) usability, (c) efficiency and (d) reliability. The greater the sophistication and quality of the web site, the greater its functionality, its usability, its efficiency and its reliability (Bauer and Schral, 2000).

An important relevant question regards however the degree of sector internationalization. This is defined as the extent of integration of inhabitant firms across borders (Kobrin, 1991: 17). Higher internationalization happens because the benefits of integration exceed the costs of a limited recognition of national, social and political differences (Kobrin, 1991: 17) and substantially affects adoption of new technologies by inhabitant firms across countries. Companies in higher internationalization sectors are expected to adopt new technologies both quickly and simultaneously across countries (Porter, 1986). The food industry is currently considered as being less internationalized compared to other sectors. Kobrin (1991) empirically identified that food was at the lowest end of a list of 56 different sectors regarding the degree of sector internationalization. This ranged between 0.073-0.090 on his internationalization index (1= maximum) compared to 0.385-0.435 on the same index for higher internationalization sectors, such as electronic components, communications equipment or motor vehicles. The above suggest that food firms in countries that are less advanced regarding www penetration and use (such as Greece) will lag behind regarding the criteria employed when assessing the sophistication and quality of web sites' content and structure. Following these, we hypothesize that: Overseas food companies' web sites are (a) more functional; (b) more usable, (c) more efficient, and (d) more reliable than the ones of Greek food companies. More details on the methodology and the measurement issues are presented hereafter.

Methodology

Measurement

Four main criteria, according to the quantitative calculation method of web site content and structure (Bauer and Schral, 2000), were used for the assessment of the web

sites of Greek and overseas food companies. One hundred questions were employed in this respect. These questions are rooted in the Bauer and Schral (2000) ranking criteria tables, but they are broadened through the use of Kaisers' (2002) and Misis and Johnson's (1999) questions for the evaluation of web sites. The combination of these possesses sufficient theoretical validity to answer our focus questions (see i.e., Bauer and Schral, 2000). Measurement of the four criteria is explained in turn:

Functionality: We assessed three groups of functionality issues. First, searching and retrieving issues were measured tracking the mechanisms that allow the customers to search for information (variables v1-v2) and collect information (variables v3-v4) from the web site. Second, navigation and browsing issues were evaluated using questions regarding navigability (variables v5-v7), navigational control objects (variables v8-v11), and navigational prediction (variables v12-v20) as they appeared in the web sites. Third, customer oriented domain features were evaluated. These features appraised the content relevancy of the web pages (variables v21-v40) and availability of on-line services (variables v41-v43).

Usability: Food companies' web pages usability was evaluated using forty-one questions by focusing upon three groups of usability issues. First, the global site understandability was assessed. This was done through the measurement of the overall organization of the firm's web site (variables v44-v46), customer-oriented guided tours and the facilitation provided to the potential visitors (variables v47-v50). Second, we assessed the on-line feedback and help features. This was done by checking for availability of help features (variables v51-v52), web site update indicators (variables v53-v54), availability of email and addresses' directories (variables v55-v57) and availability of FAQ and on-line feedback (variables v58-v61). Third, the interface and aesthetic features were evaluated. This was done by tracking presentation permanence and stability of main controls (variables v62-v64), style issues (variables v65-v67), aesthetic preferences (variables v68-v81) and other features such as foreign language support (variables v82-v84).

Efficiency: Food companies' web sites' efficiency was appraised using eleven questions assembled in two groups. First, performance was calculated by measuring the size of static pages and the speed of downloading (variables v85-v86). Second, accessibility was evaluated by measuring information accessibility for the disabled users, text-only support, cross-browser and cross-platform compatibility (variables v87-v95).

Site reliability: Food companies' web sites' reliability was evaluated using five questions. These regarded link errors (variables v96-v98), dead end web nodes, existence of under construction pages and relevant drawbacks (variables v99-v100).

Sample and data collection

The study was conducted in April 2002 using a sample of overseas and Greek food companies. The overseas food companies' catalogue consists of a sample used in a previous study (Chrysochoidis, 2000). The original list was drawn from Kobrin (1991). Only 98 out of the original 102 sites were evaluated, as 4 sites were not valid anymore. We sought Greek food and beverage companies in corresponding business areas (i.e., in the same food sub-sectors). The Greek sample firms were identified from www.icapbusiness.gr, www.in.gr, www.naftemporiki.gr, specialized Chambers of

Commerce and professional catalogues. These are main reference sources regarding collection of company names. Among the Greek firms identified, only 175 had web sites, thus, they were amenable to assessment. Among these 119 belonged to food companies, but we decided to add another 56 web sites of Greek beverage (drinks and refreshments) firms for control purposes.

The 277 web sites of sample firms were self-assessed independently by two researchers using the questions explained above (also see Tables 1-4). The similarity of the researchers' answers for the self-assessed indicators was examined. A very strong positive and statistically significant correlation appeared to exist. This led to the use of the means of the scores given by the two researchers for each such indicator in the subsequent analysis. A 1-7 scale was used for questions of quality content (1=bad and 7=excellent), a 0-1 scale for the recording of existence or lack of specific characteristics (0= lack of characteristic and 1=existence of characteristic). For questions v7, v85, v86, v92, v93, v97 the software Web Site Garage Tune Up was used through the site <http://websitegarage.netscape.com> (Kaiser, 2002). This software measures technical matters such as the number of links that each page contains, the page size in bytes, the time every page needs to be downloaded (the indication that was noted down for a 56k download speed), cross-platform compatibility as well as various link errors.

Results and Analysis

The data collected were recorded for three sample categories. The first category was that of 'overseas' food companies (that is companies principally residing in US and the main Western European countries), the second concerned Greek food companies and the third regarded the total of Greek food + beverage companies together. We run two tests. In the first one we compared the first and second category (overseas and Greek food companies). In the second test we compared the first and third category (overseas food and Greek food + beverage firms). T-tests were employed. The results of statistical analyses are presented in Tables 1,2, 3, and 4.

Functionality

Searching and retrieving information mechanisms (Variables v1-v4). There is a statistically significant difference between overseas and Greek food companies in all questions concerning searching mechanisms. The same largely applies regarding overseas and Greek food + beverage companies. Overseas companies appear to offer visitors and customers a superior ability to search and retrieve information.

Navigation and browsing issues (Variables v5-v20). No significant difference appears to exist between the firms with one exception: average links per page (overseas' firms offering a greater number of links. Nonetheless, the researchers should also point out here, that there was also a frequent incidence of lack of secondary and lower level pages (the Greek web pages had few levels and very simple structures) and that the planning of Greek web pages appeared to be without returning capability at a higher level through the web page. This caused several times difficulty to continue browsing through the site in an uninterrupted and unobstructed manner.

Table 1. Functionality (*T*-tests)

Code	Variable name	Scale	Overseas Firms		Greek Food Firms			Greek Food + Beverage Firms						
			Mean	Std.Dev.	Mean	Std.Dev.	T	Sig.	Mean	Std.Dev.	T	Sig.		
V1	scoped search (people, products)	0-1	0,12	0,33	0,03	0,19	2,218	0,028	*	0,04	0,2	2,11	0,037	*
V2	global search	0-1	0,14	0,35	0,01	0,13	3,215	0,002	**	0,08	0,71	0,91	0,364	
V3	level of retrieving customization	1-7	2,85	0,74	1,16	0,66	16,895	0,000	***	1,57	1,19	10,585	0,000	***
V4	level of retrieving feedback	1-7	4,65	2,18	3,88	2,01	2,603	0,010	**	3,65	2,07	3,587	0,000	***
V5	indicator of path	0-1	0,19	0,39	0,17	0,38	0,345	0,731		0,15	0,36	0,664	0,507	
V6	label of current position	0-1	0,98	0,15	0,93	0,66	0,758	0,450		0,91	0,58	1,54	0,125	
V7	average of links per page	WSGTU	23,12	24,82	12,63	11,6	3,836	0,000	***	12,19	11,89	4,084	0,000	***
V8	contextual controls permanence	1-7	5,77	1,52	5,51	1,92	1,063	0,289		5,52	1,94	1,139	0,256	
V9	contextual controls stability	1-7	5,91	1,34	5,74	1,7	0,793	0,429		5,79	1,71	0,62	0,536	
V10	no vertical scrolling	0-1	0,05	0,23	0,06	0,24	-0,212	0,833		0,08	0,29	-1,039	0,300	
V11	no horizontal scrolling	0-1	0,96	0,21	0,95	0,23	0,302	0,763		0,95	0,21	0,125	0,901	
V12	link title	0-1	0,87	0,34	0,84	0,37	0,552	0,582		0,79	0,41	1,703	0,090	
V13	quality of link phrase	1-7	4,9	1,62	5,35	1,43	-2,049	0,420		5,17	1,44	-1,306	0,193	
V14	content logically organized	1-7	5,51	1,27	5,52	1,58	-0,084	0,934		5,47	1,52	0,215	0,830	
V15	navigation simple to understand and use	1-7	6,07	1,12	6,1	1,36	-0,181	0,857		6,04	1,29	0,159	0,874	
V16	purpose of each page easily identified	1-7	5,79	0,89	5,91	1,24	-0,807	0,420		5,88	1,22	-0,64	0,523	
V17	essential information directly linked to the navigation system	1-7	5,34	1,24	5,27	1,36	0,364	0,716		5,33	1,26	0,94	0,925	
V18	less than three clicks to get to information	0-1	0,98	0,15	0,98	0,13	-0,216	0,830		5,98	0,15	0,87	0,931	
V19	easy backtrack or return to upper levels	1-7	5,42	1,05	5,65	1,44	-1,358	0,176		5,71	1,42	-1,884	0,061	
V20	obvious method of navigating between different sections	1-7	6,2	0,72	6,07	1,25	0,909	0,365		6,07	1,21	1,108	0,269	
V21	business unit information	1-7	4,84	1,54	4,71	1,68	0,563	0,574		4,43	1,78	1,936	0,054	
V22	product information (index, product offering)	1-7	5,22	1,4	4,73	1,68	2,287	0,023	*	4,61	1,69	3,104	0,002	**

Code	Variable name	Scale	Overseas Firms		Greek Food Firms				Greek Food + Beverage Firms					
			Mean	Std.Dev.	Mean	Std.Dev.	T	Sig.	Mean	Std.Dev.	T	Sig.		
V23	product description	1-7	4,91	1,47	4,21	1,79	3,07	0,020	*	4,24	1,76	3,301	0,001	**
V24	customer service information	1-7	4,73	1,45	3,99	1,67	3,358	0,010	**	3,79	1,64	4,738	0,000	***
V25	business infrastructure information (lab, research results etc)	1-7	4,13	1,51	3,9	1,68	1,022	0,308		3,57	1,76	2,675	0,008	**
V26	product ingredient	0-1	0,79	0,41	0,63	0,49	2,601	0,100		0,6	0,49	3,287	0,001	**
V27	product weight	0-1	0,54	0,5	0,6	0,49	-0,904	0,367		0,6	0,49	-0,914	0,362	
V28	product nutrients	0-1	0,34	0,48	0,28	0,45	0,876	0,382		0,22	0,42	1,948	0,053	
V29	days of shelf life	0-1	0,06	0,25	0,07	0,27	-0,375	0,708		0,08	0,29	-0,668	0,505	
V30	product provenance	0-1	0,36	0,48	0,61	0,49	-3,621	0,000	***	0,71	0,46	-5,641	0,000	***
V31	product preservation	0-1	0,08	0,28	0,14	0,35	-1,208	0,229		0,21	0,41	-2,879	0,004	**
V32	product certification	0-1	0,13	0,34	0,23	0,42	-1,839	0,067		0,25	0,44	-2,501	0,013	*
V33	production certification	0-1	0,12	0,33	0,42	0,5	-5,241	0,000	***	0,39	0,49	-5,291	0,000	***
V34	recipes	0-1	0,52	0,5	0,3	0,46	3,161	0,020	*	0,25	0,44	4,194	0,000	***
V35	product packing	0-1	0,44	0,5	0,6	0,49	-2,323	0,021	*	0,61	0,49	-2,636	0,009	**
V36	Points of sale (maps etc)	0-1	0,33	0,47	0,28	0,45	0,712	0,478		0,31	0,46	0,36	0,719	
V37	product history	0-1	0,21	0,41	0,23	0,42	-0,364	0,716		0,36	0,48	-2,586	0,010	**
V38	product advantages – disadvantages	0-1	0,25	0,44	0,27	0,44	-0,206	0,837		0,23	0,42	0,391	0,696	
V39	feeding habits	0-1	0,06	0,25	0,17	0,38	-2,325	0,021	*	0,24	0,43	-4,071	0,000	***
V40	info on ingredients regarding genetic modification	0-1	0,99	0,1	0,96	0,19	1,183	0,238		0,98	0,15	0,789	0,431	
V41	pricing on-line information	0-1	0,37	0,49	0,11	0,31	4,555	0,000	***	0,55	0,36	3,899	0,000	***
V42	web service	0-1	0,32	0,47	0,017	0,13	5,94	0,000	***	0,03	0,19	5,536	0,000	***
V43	FTP service	0-1	0,09	0,3	0,11	0,31	-0,17	0,865		0,07	0,27	0,585	0,560	

Table 2. Usability (*T*-tests)

Code	Variable name	Rating	Overseas Firms			Greek Food Firms			Greek Food + Beverage Firms			
			Mean	Std.Dev.		Mean	Std.Dev.	T	Sig.	Mean	Std.Dev.	T
V44	site map	0-1	0,13	0,34	0,08	0,29	0,972	0,333	0,07	0,27	1,335	0,184
V45	table of contents	0-1	0,07	0,27	0	0	2,739	0,007	0	0	2,739	0,007
V46	alphabetical index	0-1	0,02	0,15	0,00	0,09	0,737	0,462	0,00	0,07	0,971	0,334
V47	Quality of labeling system	1-7	5,24	0,94	5	1,48	1,419	0,158	4,91	1,44	2,274	0,024
V48	Form fields arranged in logical order	1-7	5,16	1,64	4,58	1,65	2,547	0,012	4,59	1,67	2,667	0,008
V49	Customer oriented guided tour	1-7	4,66	1,06	4,29	1,43	2,107	0,036	4,38	1,36	1,844	0,067
V50	Image map (business / buildings)	0-1	0,04	0,21	0,00	0,09	1,503	0,014	0,01	0,11	1,387	0,168
V51	explanatory help	1-7	5,02	1,35	4,45	1,72	2,653	0,009	4,28	1,62	3,943	0,000
V52	search help	1-7	1,33	1,1	1,09	0,49	1,947	0,054	1,31	0,91	0,119	0,905
V53	global update indicator	0-1	0,04	0,21	0,05	0,23	-0,302	0,763	0,03	0,19	0,326	0,745
V54	scoped update indicator	0-1	0,03	0,18	0,01	0,13	0,676	0,500	0,01	0,13	0,711	0,478
V55	E-mail contact	0-1	0,97	0,18	0,94	0,24	0,931	0,353	0,95	0,22	0,761	0,447
V56	phone/fax number	0-1	0,92	0,27	0,95	0,22	-0,733	0,464	0,93	0,26	-0,04	0,968
V57	mailing address	0-1	0,86	0,35	0,94	0,24	-1,949	0,530	0,9	0,3	-1,044	0,298
V58	FAQ feature	0-1	0,14	0,35	0,442	0,21	2,365	0,190	0,03	0,19	2,714	0,008
V59	questionnaire feature	0-1	0,05	0,23	0,442	0,21	0,346	0,730	0,03	0,19	0,696	0,488
V60	quest book	0-1	0,06	0,25	0,07	0,26	-0,136	0,892	0,08	0,29	-0,668	0,505
V61	comments	0-1	0,54	0,5	0,38	0,49	2,264	0,025	0,38	0,49	2,476	0,014
V62	direct controls permanence	1-7	6	1,32	5,99	1,63	0,043	0,966	5,85	1,72	0,774	0,440
V63	indirect controls permanence	1-7	5,92	1,33	5,57	1,75	1,657	0,099	5,47	1,81	2,285	0,023
V64	stability	1-7	6,08	1,34	5,78	1,42	1,542	0,125	5,72	1,47	1,972	0,050
V65	link color style uniformity	1-7	5,64	1,21	5,65	1,24	-0,05	0,960	5,63	1,26	0,064	0,949
V66	global style uniformity	1-7	5,69	1,05	5,58	1,25	0,726	0,469	5,59	1,23	0,734	0,464
V67	global style guide	1-7	5,47	1,05	5,23	1,3	1,474	0,142	5,27	1,31	1,345	0,180

Code	Variable name	Rating	Overseas Firms		Greek Food Firms				Greek Food + Beverage Firms					
			Mean	Std.Dev.	Mean	Std.Dev.	T	Sig.	Mean	Std.Dev	T	Sig.		
V68	layout, use of color, fonts, images consistent throughout the site	1-7	5,51	1	4,51	1,33	3,638	0,000	***	5,02	1,34	3,27	0,001	***
V69	less than three fonts used	0-1	1	0	1,02	0,3	-0,631	0,529		1,01	0,24	-0,631	0,529	
V70	number of colors used in the design	1-7	4,51	1,2	4,48	1,3	0,158	0,875		4,51	1,24	0,059	0,953	
V71	appropriate design for the purpose and the intended audience	1-7	4,76	1,03	4,58	1,37	1,036	0,301		4,57	1,35	1,273	0,204	
V72	page layout balanced, clean and uncluttered	1-7	5,15	1,02	4,83	1,29	1,992	0,048	*	4,84	1,25	2,179	0,030	*
V73	images smooth and properly anti-a liased to the background	1-7	5,69	0,97	5,14	1,34	3,402	0,010	**	5,18	1,34	3,551	0,000	***
V74	graphics appropriate and relevant to the content	1-7	5,41	0,93	5,02	1,34	2,444	0,015	*	4,99	1,31	2,939	0,004	**
V75	eyes directed to the content or important page elements	1-7	5,58	0,73	5,36	1,09	1,719	0,870		5,35	1,08	2,068	0,040	*
V76	pleasing color combination	1-7	4,59	1,13	4,5	1,39	0,505	0,614		4,54	1,32	0,315	0,753	
V77	clearly legible text	1-7	5,74	0,65	5,59	1,07	1,184	0,238		5,59	1,01	1,46	0,146	
V78	important content visible without scrolling in 800x600 resolution	1-7	5,26	0,71	5,28	0,85	-0,178	0,658		5,26	0,95	0,032	0,974	
V79	copyright and contact information easily located	1-7	4,96	1,06	5,07	1,22	-0,716	0,475		5,15	1,28	-1,329	0,185	
V80	doesn't require a great deal of vertical scrolling	1-7	5	0,82	4,87	0,94	1,078	0,282		4,95	1,96	0,418	0,676	
V81	purpose of the site immediately clear	1-7	5,27	0,68	5,19	1,1	0,707	0,481		5,24	1	0,306	0,760	
V82	foreign language support	0-1	0,12	0,33	0,7	0,46	-10,455	0,000	***	0,7	0,46	-11,855	0,000	***
V83	what is new feature	0-1	0,55	0,5	0,38	0,49	2,424	0,016	*	0,3	0,46	3,914	0,000	***
V84	screen resolution indicator	0-1	0,04	0,21	0,01	0,13	1,053	0,294		0,237	0,15	0,825	0,411	

Table 3. Efficiency (*T*-tests)

Code	Variable name	Rating	Overseas Firms		Greek Food Firms			Greek Food + Beverage Firms				
			Mean	Std.Dev.	Mean	Std.Dev.	T	Sig.	Mean	Std.Dev	T	Sig.
V85	Static page size	WSGTU	149246	341015	161626	201018	-0,316	0,753	149476	188689	-0,006	0,995
V86	speed of downloading	WSGTU	35,60	79,65	38,88	46,80	-0,358	0,721	35,86	44,01	-0,031	0,976
V87	support for text-only version	0-1	0	0	0,02	0,16	-1,748	0,083	0,01	0,13	-1,742	0,083
V88	image title	0-1	0,52	0,5	0,24	0,43	4,185	0,000	0,24	0,43	4,509	0,000
V89	global readability	1-7	5,68	0,73	5,43	0,99	2,057	0,041	5,41	0,91	2,637	0,009
V90	switch of music	0-1	0,01	0,1	0,01	0,13	-0,404	0,687	0,02	0,15	-0,789	0,431
V91	design accessible to disabled users	0-1	0	0	0	0			0	0		
V92	cross-browser compatible	0-1	0,58	0,5	0,44	0,5	2,063	0,040	0,45	0,5	1,999	0,047
V93	cross-platform compatible	0-1	0,91	0,29	0,85	0,36	1,346	0,180	0,86	0,34	1,155	0,249
V94	number of pages regarding frames	1-7	0	0	0	0			0	0		
V95	non-frame version	0-1	0	0	0,00	0,09	-1	0,319	0,00	0,07	-1	0,319

Table 4. Reliability (*T*-tests)

Code	Variable name	Rating	Overseas Firms		Greek Food Firms			Greek Food + Beverage Firms				
			Mean	Std.Dev.	Mean	Std.Dev.	T	Sig.	Mean	Std.Dev	T	Sig.
V96	no dangling links	0-1	0,96	0,21	0,95	0,23	0,302	0,763	0,95	0,21	0,125	0,901
V97	no invalid links	0-1	0,95	0,22	0,89	0,31	1,679	0,095	0,9	0,3	1,549	0,123
V98	no unimplemented links	0-1	0,93	0,25	0,8	0,4	2,98	0,003	0,82	0,38	2,831	0,005
V99	no dead end Web nodes	0-1	0,98	0,15	0,93	0,26	1,698	0,091	0,92	0,27	2,136	0,034
V100	no destination nodes(unexpectedly) under construction	0-1	0,96	0,21	0,96	0,19	-0,308	0,758	0,97	0,17	-0,569	0,570

Customer oriented domain features (Variables v21-v43). There were many significant differences between overseas and Greek companies (applying for both Greek food and Greek food + beverage firms). The differences were located in the supply of information regarding specific aspects of information regarding the products, namely: product information, description, customer service information, provenance, production certification, recipes, packing, animal feeding habits, and in the company's customer services provision through the web (pricing on-line information). There is an important observation here in that Greek companies appeared to be better positioned (i.e., scored higher) regarding product provenance, production certification and packing. This may be due to legislation in that compulsory ISO production certification has been imposed by the European Union after 1999, and origin of appellation that exists for certain Greek products, thus introducing a certain statistical bias in our sample. On the other hand, no statistically significant difference was identified regarding product ingredients, weight, nutrients, days of shelf life, product preservation, certification, history, advantages, information on ingredients regarding genetic modification. Nonetheless, many times, secondary level web pages of the Greek firms contained very little information.

Usability

Global site understandability (Variables v44-v50). Significant differences existed regarding most questions. More specifically, differences existed for availability of table of contents, arrangement in logical order, availability of guided tours and in the existence of images and maps that can assist understanding the company's web site.

On-line feedback and help features (Variables v51-v61). There is a statistically significant difference regarding the existence of explanatory help and availability for visitors writing comments. No statistically difference was identified regarding information for inside the company and their staff (i.e., no email addresses, phone/fax numbers etc). The lack of availability of such information is understandable however, as certain web site email extraction software can assemble such addresses for subsequent bulk email that causes major disturbance to daily business operations.

Interface and aesthetic features (Variables v62-v84). Differences were identified regarding the layout, use of color, fonts, consistency of images throughout the site, balance of page layout being clean and uncluttered, images smooth and properly anti-aliased to the background, appropriateness of graphics and relevant to the content, foreign language support (widely available in Greek sites), and what is new feature. Moreover differences were identified between overseas food and Greek food + beverage firms regarding permanence of indirect controls, stability, and eyes directed to the content or important page elements. On the other hand, albeit the differences for the remaining of investigated elements were in the same direction (web sites of overseas firms being always more usable than the web sites of Greek firms), such differences were not statistically significant.

Efficiency

Web sites' performance (Variables v85-v86). Basically no difference was found regarding either the static web page size or speed of downloading.

Information accessibility (Variables v87-v95). Differences were statistically significant regarding availability of titles, global readability and cross-browser compatibility

indicating greater technical care used in the construction of the web sites by overseas food firms. It is characteristic that most Greek companies had photographs of products without any explanation or titles. Interestingly no provision was made in any web site with respect to accessibility by disabled users (i.e., very large letters etc).

Site reliability

Link issues (Variables v96-v98) and relevant drawbacks. No considerable difference was found regarding lack of dagging or invalid links. Nonetheless, the difference was statistically significant regarding unimplemented links and dead end web nodes. Many of the links in the Greek web sites were in an inactive mode and in many cases unfinished or they ended to a deadlock, these web pages were built in a hastily manner.

Moreover, the researchers' overall qualitative impression created from the exploration and navigation through the web pages of Greek food and beverage companies, is that besides big companies that presented their company profile at a greater extent and their products at a lesser one, small and medium size companies show a much simpler web presence and that their web sites are rather badly designed.

Conclusions and discussion

The statistical analysis confirmed overall the original hypotheses, although it also revealed a few issues where no differences appear to exist between the web sites of Greek and overseas firms. The researchers' overall qualitative impression is also important here, in that they felt that the web sites of Greek food and beverage companies exhibited a simpler web presence compared to their foreign counterparts and that the web sites of the Greek food and beverage firms were rather badly designed and less elaborate than the ones developed by overseas food firms.

The individual and overall findings suggest a number of issues here. Some of the issues concern the direction for the Greek food and beverage firms to follow, in that they first have to clarify their overall strategy regarding their presence in the web and marketing aims. These firms have to identify the exact areas where their sites need improvement, and this article offers a series of elements and issues to ponder over. Detailing on this point, Greek firms have to define more clearly targets regarding how to assist better site visitors in their searching and retrieving information, improve visitor experiences regarding browsing and navigability, enhance the use of navigation control objects, and increase navigation prediction. Greek food and beverage firms also have to decrease hindrance to the visitors of their web sites by increase visitor site understandability, organize better their sites, provide customer-oriented tours, help and on-line feedback. Aesthetic features are another important aspect. The layout, use of color, fonts, consistency of images throughout the site, clean and uncluttered page layout, smooth and properly anti-liased images, appropriate and content relevant graphics, permanence of controls are important issues for improved visitor experience. Moreover, greater attention to technical efficiency matters is necessary as matters such as cross-browser compatibility are important. Last, but not least, it is fundamental to look at improving the quality of the site as inactive links or dead end web nodes and unfinished web pages may guarantee that visitors may not stay long in the web site, thus decreasing the probability that these visitors will continue the exploration, interact with the site, or proceed further to buy products and services through the firm's web site.

Second, the individual and overall findings suggest that this phenomenon is not isolated and in fact it may reflect a wider issue. The present research endeavor provides evidence of the strong influence of sector internationalization upon the adoption of www technology and practice across countries. As the food industry is a lower internationalization sector, adoption of web technologies by food firms is taking place at a slower pace across countries compared to sectors of higher internationalization.

Third, our findings may raise questions regarding the specific food and beverage sectors (or products) that are potentially able to receive more advantages from the web. Closely related is questioning regarding the type of web presence that is more appropriate to the performance of the underlined specific food and beverage sectors. Certainly, not all food and beverage products are prone to receive equal advantages from the web. This has to do with the nature of the focus products and consumer behaviour regarding the purchase and consumption of the focus product (see Chrysochoidis and Zerva, in press). Nonetheless, there is an underlying information provision basis that is moving dynamically towards increased communication to the consumer. Reasons include, among others, consumer willingness to be more informed about product health and safety issues, as well as greater use of the new medium by the society as a whole. Turning now to the type of web presence that is more appropriate to the performance of the underlined specific food and beverage sectors, there too, a number of issues are also at play. Such issues are difficult to explore in the limited available space here, as they relate to the business model adopted by the inhabitant firms including the adopted marketing strategy regarding distribution channels and integrated communications.

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