

E-Commerce Trends in Hawai'i

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The Center for Entrepreneurship and E-Business

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Foreword

It is with great privilege that we present the first edition of *E-commerce Trends in Hawai'i*. As the State is recovering from the longest economic recession of its history, the use of electronic means to promote the economy has been identified as one of the key strategies of Governor Cayetano's Administration. This policy priority is indeed a sensible one as the growth of e-commerce has taken its own phenomenal path. The only decision businesses can make is to decide how soon they can join the digital market and how well they compete in this New Economy.

The purpose of this publication is to provide the readers with a comprehensive, objective and reliable set of data that can be used in the community to promote e-business in Hawai'i. It is designed for use by the business community, the legislators, researchers and all those interested in learning more about E-commerce in Hawai'i.

This report is more than just a survey and a report card. It outlines a number of frameworks for understanding the nature of e-commerce and its phenomenal expansion. It suggests new approaches to do business and new ways to measure the effectiveness of e-commerce.

However, unlike surveys conducted in more established areas such as tourism or healthcare, research in e-commerce is at worst confusing and incomplete, and at best quite fragmented. Compounded by the lack of data and the tight deadline, this first report should be viewed as a first attempt to outline a framework for assessing and evaluating the practices of e-commerce in Hawai'i. And based on this framework, trends can be made.

As a preliminary study, we probably raise more issues in this report than we can fully address all aspects of a complex economy. We invite your comments on how you are using the *E-commerce Trends in Hawai'i* and your suggestions for improvements. In particular, since this is the first edition, we strike to balance clarity versus the complexity of the e-commerce reality.

Tung X. Bui, Ph.D., Dr.rer.pol.

email: tbui@cba.hawaii.edu

Web: ec.cba.hawaii.edu/tbui

Acknowledgements

This work could not have been done without the participation of the thirty one key business and technology leaders who gave us their invaluable time to share their assessment and vision about the state of e-commerce in Hawai'i. Their success and commitment to the Aloha State have much inspired us. Our sincere appreciation goes to the hundred of respondents who took their time to answer a long online questionnaire.

I would like to thank my staff for making this project a reality. Natalie Roethlin and Nicole Wiedemann were instrumental in conducting the first round of interviews with a number of business and technology leaders in the business community. As interns, they also spent an enormous amount of time searching data for this research. It was not an easy task. Interestingly enough, comprehensive data are still difficult to find even in a supposedly information-rich environment. Thanks also go to Aris Zhu who joined the research staff. Zhu and Wiedemann almost killed the mouse while scrutinizing more than 800 Hawai'i's Web sites.

We would like to thank Dolly Omiya and her staff at the UH CBA College Relations Office to keep up with us in reproducing this report in an extremely tight schedule.

Last but not least, we would like to thank the State of Hawai'i Department of Business, Economic Development and Tourism for its sponsorship of this study.

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Summary of Findings

This study seeks to capture the current trends of e-commerce in the Aloha State. At the risk of outdated ourselves due to the fast changing pace of the digital economy, we are able to depict a number of trends in the practices of e-commerce in Hawai'i.

At the macro-economic level, all indicators seem to suggest that Hawai'i is ready to embark in e-commerce. The State enjoys a robust information infrastructure, and possess some of the most important ingredients of a "silicon" center. The state population is educated. Legislative initiatives to promote the new economy are underway. And most importantly, the recent success of a few local high-tech companies – large and small – have significantly boosted the level of self-confidence of both business people and policy makers. To join the league of "e-nations," these achievements should set the stage to improve the still lackluster capital invested in information-based companies.

At the e-enterprise level, Hawai'i businesses are finding their way in cyberspace. Twelve percent of the respondents have had their Web business for more than five years. Forty three percent have their system up during the last two to five years. And within the last two years, 35 percent more companies have joined the digital market place.

We estimate that 37 percent of small businesses in Hawai'i have a Web site and more than 65 percent of all businesses in Hawai'i use at least some electronic means to conduct business – either via simple e-mail correspondence or with some more sophisticated form of data interchange. In a study conducted by the U.S. Small Business Administration, this is slightly higher than the national average of 35 percent of small businesses that have Web sites.

The online survey revealed that companies in Hawai'i that invested on e-business do generate e-revenues. For most of them, and with the exception of a few companies that conduct business exclusively on cyberspace, e-revenues account for less than 10 percent of the company's entire revenues with e-sales varying widely. The majority of Hawai'i businesses that are now able to do business online see e-business as a complement to their traditional business.

Research Methodology

This report is a combination of data gathering techniques and analytical methods. Individual face-to-face and phone interviews with business, technology and public leaders in Hawai‘i were conducted to depict some Internet trends and their impact on the state’s economy. Research databases were extensively referenced to verify and validate statements voiced by interviewees and questionnaire respondents. We use standard statistical tools to evaluate the functionalities of Hawai‘i’s Web sites across all major economic sectors. Perhaps the most interesting and challenging effort of all was to devise a set of metrics to measure the new economy at both the macro-economic and micro-economic levels.

Macroeconomic Study

We sought to know how well Hawai‘i, as a state economy, is ready for e-commerce. We looked at various data to evaluate various economic factors, to include education, technology and labor components, and attempted to see how ready they are to support Hawai‘i’s information economy. We conducted extensive interviews with key experts in e-business to capture their vision of the future of e-commerce in Hawai‘i. Whenever possible or appropriate, we attempted to benchmark Hawai‘i’s performance against others. In particular, we were interested in comparing Hawai‘i with seven of the world’s most industrialized nations (G7), high-tech U.S. states and with Asia-Pacific countries that we seek to do business with.

Microeconomic Study

On an e-enterprise level, we conducted a detailed evaluation of 760 Hawai‘i Web sites selected from a database of 3000 sites. The companies in the study sample do not necessarily have their headquarters in Hawai‘i, but all of them have one or more offices in the state. We examined their business models by evaluating the characteristics of the sites and their features. We attempted to understand the business rationale on going digital by setting an online survey sent out to more than 2000 statewide businesses. We also ran an online survey asking Hawai‘i companies in Hawai‘i what their experiences are with e-commerce.

Research databases consulted

Bloomberg

DBEDT

Forrester Research Inc.

Hawai'i Business Magazine

Information Week

International Data Corporation/Industry Standard

Internetindicators.com

Internet Software Consortium

mids.org

Pacific Research Institute for Information System Management (PRIISM)

Pacific Business News

PricewaterhouseCoopers

SMS

U.S. Department of Commerce

U.S. Small Business Administration

The Foundation of E-commerce

Definition of E-commerce

Electronic Commerce (EC) allows business transactions to take place via telecommunications and computer networks, including the Internet and the World Wide Web.

As a market, electronic commerce serves as a digital venue for the buying and selling of products and services. As a means for information exchange, e-commerce allows business entities both within an organization and/or between organizations to communicate effectively.

E-Business embraces the broadest definition of EC. E-business includes customer service and intra-business tasks and is frequently used interchangeably with EC.

In traditional commerce, all market dimensions are physical. In today's commerce, all market dimensions are digital. The dimensions for today's market are:

- the product (service) sold [physical / digital];
- the process [physical / digital] the delivery agent (or intermediary) [physical / digital]

Most businesses will likely position themselves in “partial” e-commerce in that their business profile will include a mix of digital and physical dimensions. Typically, business transactions are done electronically while goods or services are physically exchanged.

Classification of EC by the Nature of the Transactions

- Business-to-business
- Business-to-customer
- Intra-business transactions
- Others

The Benefits of Electronic Commerce

- Expands the marketplace to national and international markets
- Decreases the cost of creating, processing, distributing, storing and retrieving paper-based information
- Allows reduced inventories and overhead by facilitating “pull” type supply chain management
- The pull-type processing allows for customization of products and services which provides competitive advantage to its implementers

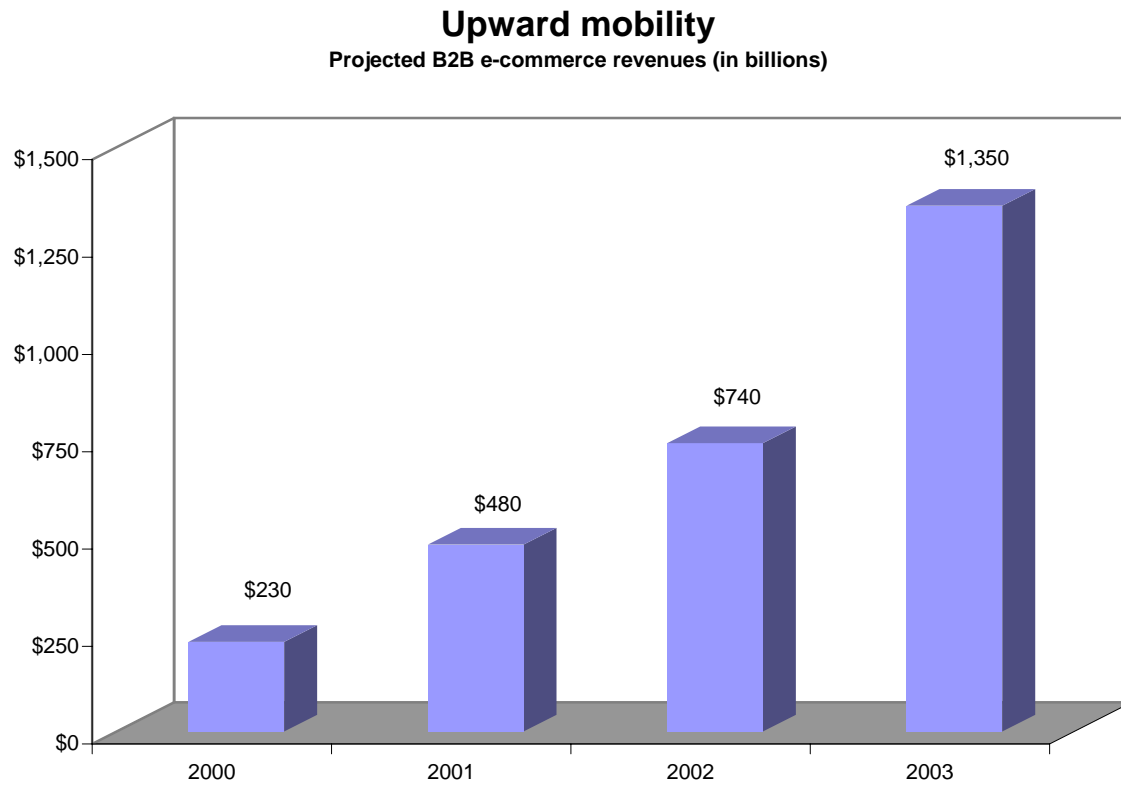
Benefits to Organizations

- Reduces the time between the outlay of capital and the receipt of products and services
- Supports business processes reengineering (BPR) efforts
- Lowers telecommunications cost - the Internet is much cheaper than value added networks (VANs)

Benefits to Customers

- Enables customers to shop or do other transactions 24 hours a day, all year round from almost any location
- Provides customers with more choices
- Provides customers with less expensive products and services by allowing them to shop in many places and conduct quick comparisons
- Allows quick delivery of products and services in some cases, especially with digitized products
- Customers can receive relevant and detailed information in seconds, rather than in days or weeks
- Makes it possible to participate in virtual auctions
- Allows customers to interact with other customers in electronic communities and exchange ideas as well as compare experiences

- Electronic commerce facilitates competition, which results in substantial discounts



Source: Forrester Research Inc.

Benefits to Society

- Enables more individuals to work at home and to do less traveling for shopping, resulting in less traffic on the roads and lower air pollution
- Allows some merchandise to be sold at lower prices benefiting the poor ones
- Enables people in Third World countries and rural areas to enjoy products and services which otherwise are not available to them
- Facilitates delivery of public services at a reduced cost, increases effectiveness, and/or improves quality of the future of E-Commerce

The Limitations of Electronic Commerce

Technical limitations:

- Lack of sufficient system's security, reliability, standards, and communication protocols
- Insufficient telecommunication bandwidth
- The software development tools are still evolving and changing rapidly
- Difficulties in integrating the Internet and electronic commerce software with some existing applications and databases
- The need for special Web servers and other infrastructures, in addition to the network servers (additional cost)
- Possible problems of interoperability, meaning that some EC software does not fit with some hardware, or is incompatible with some operating systems or other components

Non-Technical Limitations

Cost and justification (35% of the respondents)

- The cost of developing an EC in house can be very high, and mistakes due to lack of experience, may result in delays. There are many opportunities for outsourcing, but where and how to do it is not a simple issue. Furthermore, to justify the system one needs to deal with some intangible benefits which are difficult to quantify.

Security and Privacy (17% of the respondents)

- These issues are especially important in the B2C area, and security concerns are not truly so serious from a technical standpoint. Privacy measures are constantly improving too. Yet, the customers perceive these issues as very important and therefore the EC industry has a very long and difficult task of convincing customers that online transactions and privacy are, in fact, fairly secure.
- Lack of trust and user resistance (4%).
- Customers do not trust an unknown faceless seller, paperless transactions, and electronic money. So switching from a physical to a virtual store may be difficult.

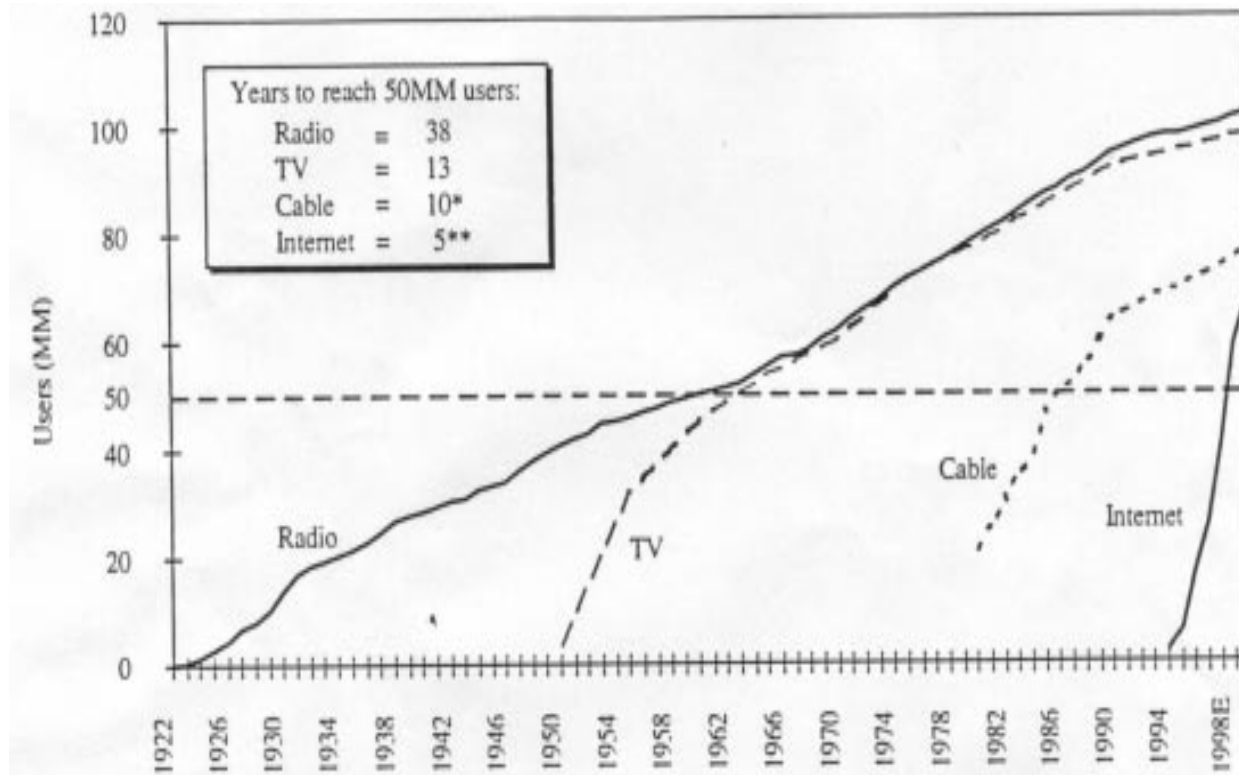
Other limiting factors

- Lack of touch and feel online
- Many unresolved legal issues
- Rapidly evolving and changing EC
- Lack of support services
- Insufficient large enough number of sellers and buyers
- Breakdown of human relationships
- Expensive and/or inconvenient access to the Internet

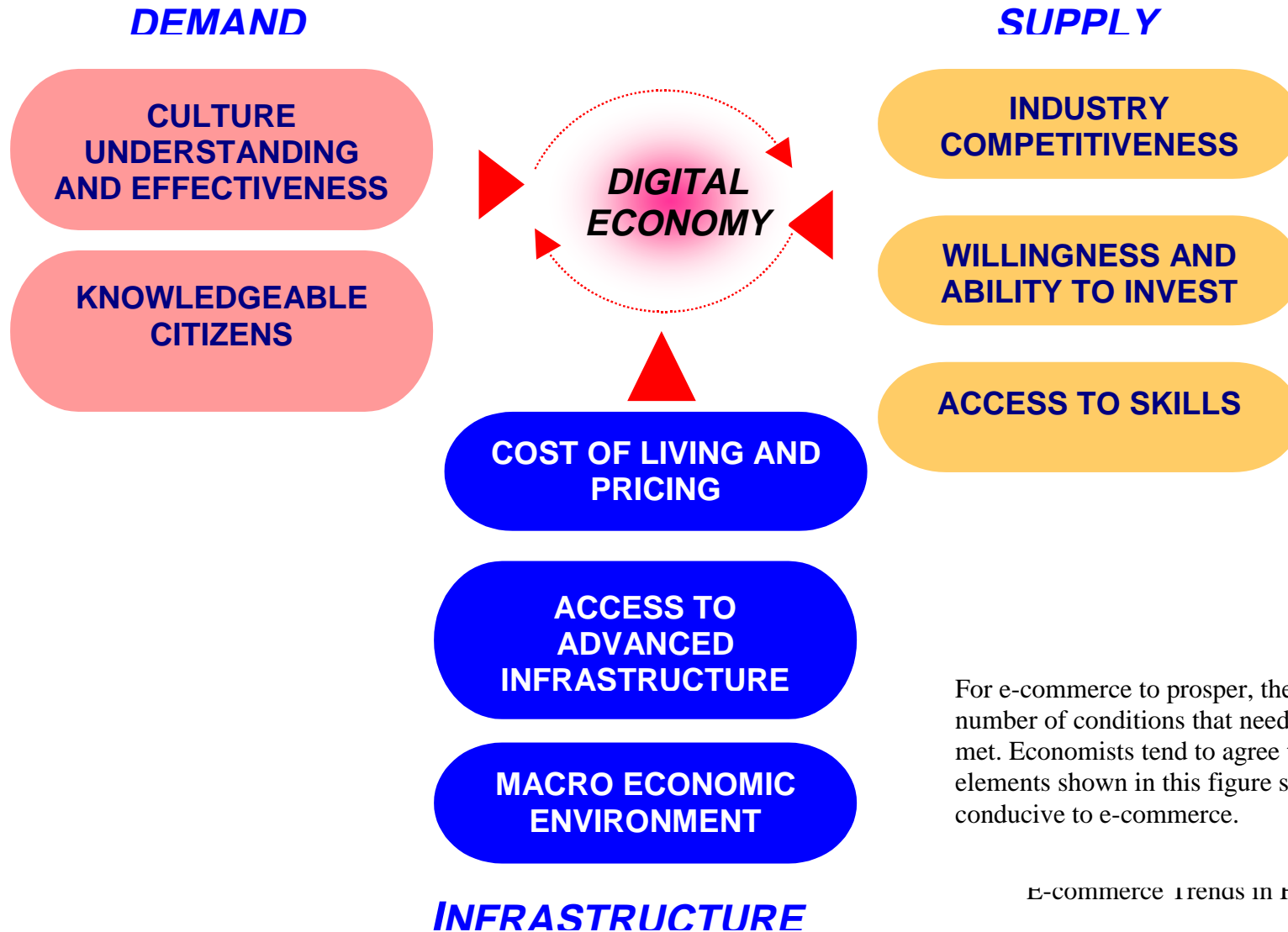
The figure below shows that it took 38 years for the Radio to reach 50 million listeners. The Internet took less than five years to reach the same number of people.

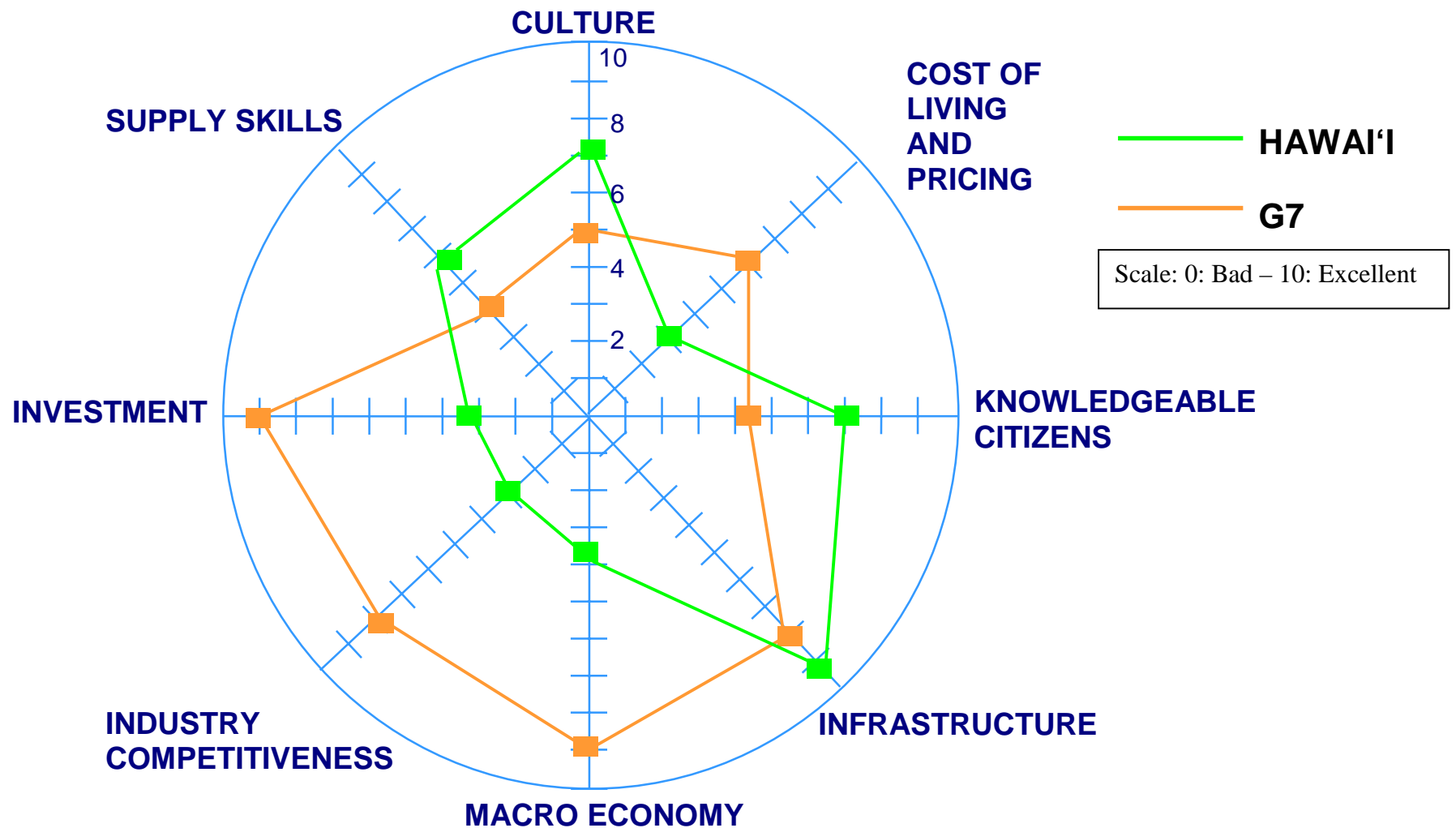
But the World Wide Web is still a small Web world after all. Internet sales still account for less than 1 percent of total retail sales in the U.S. economy. According to a joint National Retail Federation and Forrester Research Inc. study, online sales in 1999 were \$20.3 billion compared with \$3 trillion for all retail sales. By 2003, online sales are expected to reach \$144 billion, still about 6 percent of retail sales.

According to Bloomberg Research, 35 percent of small business owners maintain a Web site. The most common barrier for small businesses in the adoption of e-commerce is the cost.



Macroeconomic Study: A Framework for EC Readiness





Compared with the seven most industrialized nations, Hawai'i seems to fare well on four dimensions: infrastructure, knowledgeable citizens, supply skills and culture. There are four recognized areas where Hawai'i needs to catch up with the leading nations: industry competitiveness, investment, macro-economic factors and the cost of living. It appears from the survey that there was some correlation between industry competitiveness and macro-economic factors. Interview and survey subjects tend to relate the lack of economic diversification with the ability to compete within selected economic sectors (including tourism).

The following summarizes some of the main findings regarding the eight “pillars” of the new economy:

Industry Competitiveness

With the few noted successes – such as Digital Island and Worldpoint Inc. – “digital” industries have yet to be developed. The economy is still heavily driven by tourism. To an extent, the technology sector is related to the military presence in the State. Interviewees recognized recent efforts to link tourism to science and technology and to use the education system as a major economic catalyst not only to provide skilled workers to the State, but also to attract education related visitors.

Products that have shown signs of online success in Hawai‘i include, but not limited to, vacations packages, well-recognized agricultural products and flowers, and research materials. The search for a “killer product” to be sold in cybermarket is a theme repeated by many respondents.

Supply Skills

Creating and nurturing a trained workforce is essential for expanding enterprises and governments seeking to attract high-technology and information technology companies. Computer literacy and knowledge of business basics are often recognized as two of the most important required skills.

A general perception about the labor market place in Hawai‘i is that we do not have enough skilled labor to support the new economy. This statement is, however, not shared by a few key individuals who are recognized by the business community as pioneers in e-business. Twenty eight percent argue that the institutions of higher education – in particular the UH system with the Manoa campus as a Carnegie 1 research university – in the State have generated sufficient qualified workers for the 21st century economy.

If given favorable conditions (working environment, challenging responsibilities, and favorable compensation packages), workers would excel more. What is probably missing is a critical mass of “new economy” opportunities (i.e., when the number of new businesses, new dot-com workers) to foster an ambiance of innovation and entrepreneurship.

Willingness and Ability to Invest

Venture capital constitutes a critical resource that must be in place. Experiences from the success of established enterprises, as well as lessons recently learned from the rise and fall of dot.com companies, indicate that e-commerce will not flourish unless venture capital is available.

Recently, venture capital funding has shown signs of growth. However, more capital is needed to promote new businesses. The majority of the interviewees indicated that finding venture capitalists is difficult. Yet, finding sufficient funding is even more difficult.

Collaboration between companies – in any legally conceivable form – will be paramount in the future. Rigidly hierarchical organizations, large and small, will not be able to adapt to change at the pace being set by the new economy. The successful enterprise in the new economy needs to understand this shift to dynamic cross-border relationships.

Culture Understanding and Effectiveness

Most respondents are proud of the inter-cultural heritage of the State. They praise the opportunity to gain exposure to international business and politics. But, when asked about the impact of the Hawai'i culture on doing e-business, more than 50 percent refer to the "island" mentality that prevents certain business people from looking beyond the local economy.

Knowledgeable Citizens

Three fourths of the interviewees consider the local citizens educated. Four-fifths of the population are high school graduates, ranking Hawai'i 11th in the U.S. One fourth of all civilian workers are in professional or managerial positions. Twenty percent of English-speaking residents in Hawai'i speak at least one additional language.

This high level of education is translated to a higher usage of information technology. As seen later in this report, there are more adults in Hawai'i that use the Internet than in any other state.

According to a study conducted in November 1998 by Qmark Research & Polling, 42 percent of adults in Hawai'i have access to the Internet. The percentage is higher than the national average (28-35 percent). Furthermore, Internet access increases with individual income.

With a high telephone penetration rate of 93.2 percent similar to that of the country (U.S. national average is 94 percent in 1998), Hawai'i scores better in computer and Internet penetration:

	U.S.* (%)	Hawai'i ** (%)
1997	36.6	63
1998	42.1	65

Table. Percent of Households with a Computer – U.S. versus Hawai'i (Source NTIA (*) and SMS (**))

	U.S. * (%)	Hawai'i ** (%)
Income < \$50K	24.6	31
Income < \$75K	43.9	54
Income > \$75%	60.3	67

Table. Percent of Households Using the Internet by Household Income – U.S. versus Hawai'i (Source NTIA (*) and Qmark Research & Polling (**)) – 1998

Costs of Living and Pricing

As reported elsewhere in this study, Honolulu's cost of living is lower than major Asian cities. But, when compared to the Mainland U.S. where most dot-com companies are created, the Hawai'i cost of living index is 156.2, ranking 290th among the top 300 American cities (1999). High cost of housing, schooling and State taxes are among the factors cited.

The surge in the cost of living in other parts of the U.S. due to the booming economy has, however, reduced the gap between Hawai'i and other centers of economic excellence that the Aloha State wants to compete with. 15 percent of the experts interviewed did notice that the globalization of the market – in particular, e-tailing – has helped keep the costs of certain products in Hawai'i lower.

Access to Advanced Infrastructure

Perhaps this is the brightest achievement. 95 percent of the respondents acknowledge the quality of the information structure in the State. As reported elsewhere in this study, Hawai'i has the greatest telecommunication capacity available for business use of any U.S. state. Hawai'i has strong computing resources and the current State administration is committed to supporting the creation of a knowledge-based economy. Two business leaders also point out that the available technology has yet to be fully exploited.

Information infrastructure is the foundation for a digital economy. All business entities – public and private alike – are electronically connected via a network of local, national and international Internet access providers using very high speed computer networks. With a little more than 5,900 sq. miles, the State of Hawai'i is equipped with an advanced telecommunication infrastructure:

- 100% digital switching matrix support by fiber optic trunks (since 1998)
- Two inter-island fiber systems
- Cable modem and DSL available statewide
- Wireless ISP services available in selected areas.
- Content distribution capabilities through Digital Island and connectivity through PIXC
- High performance computing and data archiving capabilities
- Multiple satellite access
- Two advanced networks to be added to the current telecommunication infrastructure
- Southern Cross and Japan//U.S. Cable Network (JUSCN) with broadband connectivity up to 160 and 400 gigabits by the second quarter of 2001
- Japan/US Cable via the Aleutian and Hawaiian islands with a capacity of 5.12 terabits by the second quarter of 2002

A unique strength of the communications infrastructure in Hawai'i is its strategic position between the Asia-Pacific region and the continental U.S. Hawai'i resides well in the footprints of the U.S., Asian and Tonga satellite systems. There are more than 30 telecommunication satellites providing high data rate links. With 29 thousands miles of undersea fiber optic cables, 140,000 voice-equivalent circuits can simultaneously transport voice, data and image transmissions to North America and Asia. Hawai'i also has 30 dedicated T-1 links to every major business center in Asia and Europe.

A strong telecommunication infrastructure must be provided in order to attract businesses that aim at the global market. Once the infrastructure is in place, it has to be sustained in the face of constant technology development.

Macro-economic Environment

Without exception, all respondents understand well the economic environment they are dealing with: unique geographical location to maintain tourism, military presence, and certain specific spots of excellence (e.g., tropical agriculture, ocean research, astronomy, education). Respondents (52%) also acknowledge the government efforts to make the business environment more favorable. These include the legislative initiatives in providing tax incentives, technology investment programs, e-commerce measures (e.g., electronic records and signatures, e-government).

The eight-dimension scores given to Hawai'i on page 15 are weighted averages from the experts' assessment of the readiness of Hawai'i to embark on e-commerce.

Computer Usage in Hawai'i

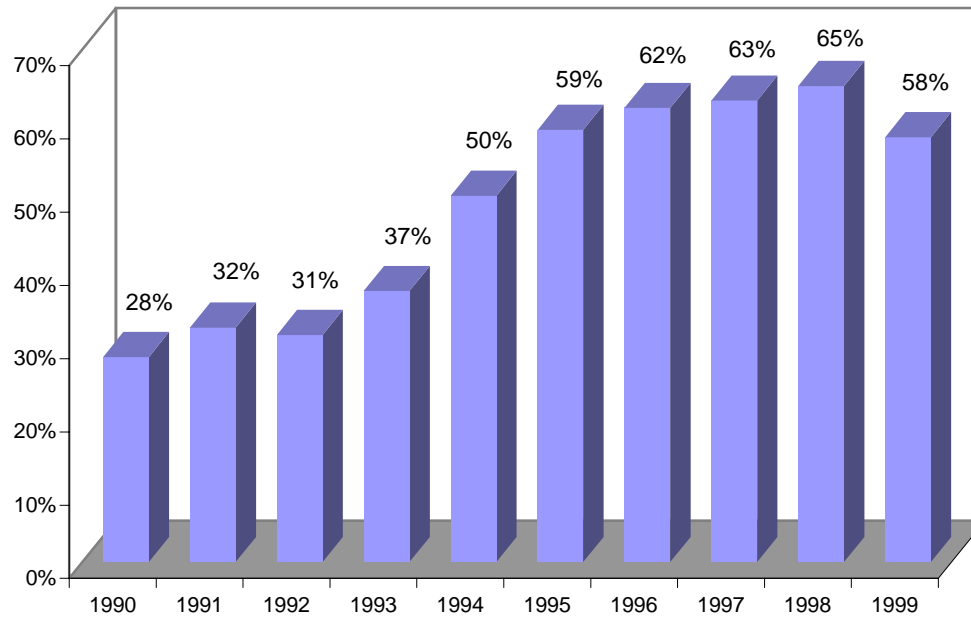


Figure . Percentage of Hawaii Homes with a PC (Source: 1999 SMS Hawaii Market Study)

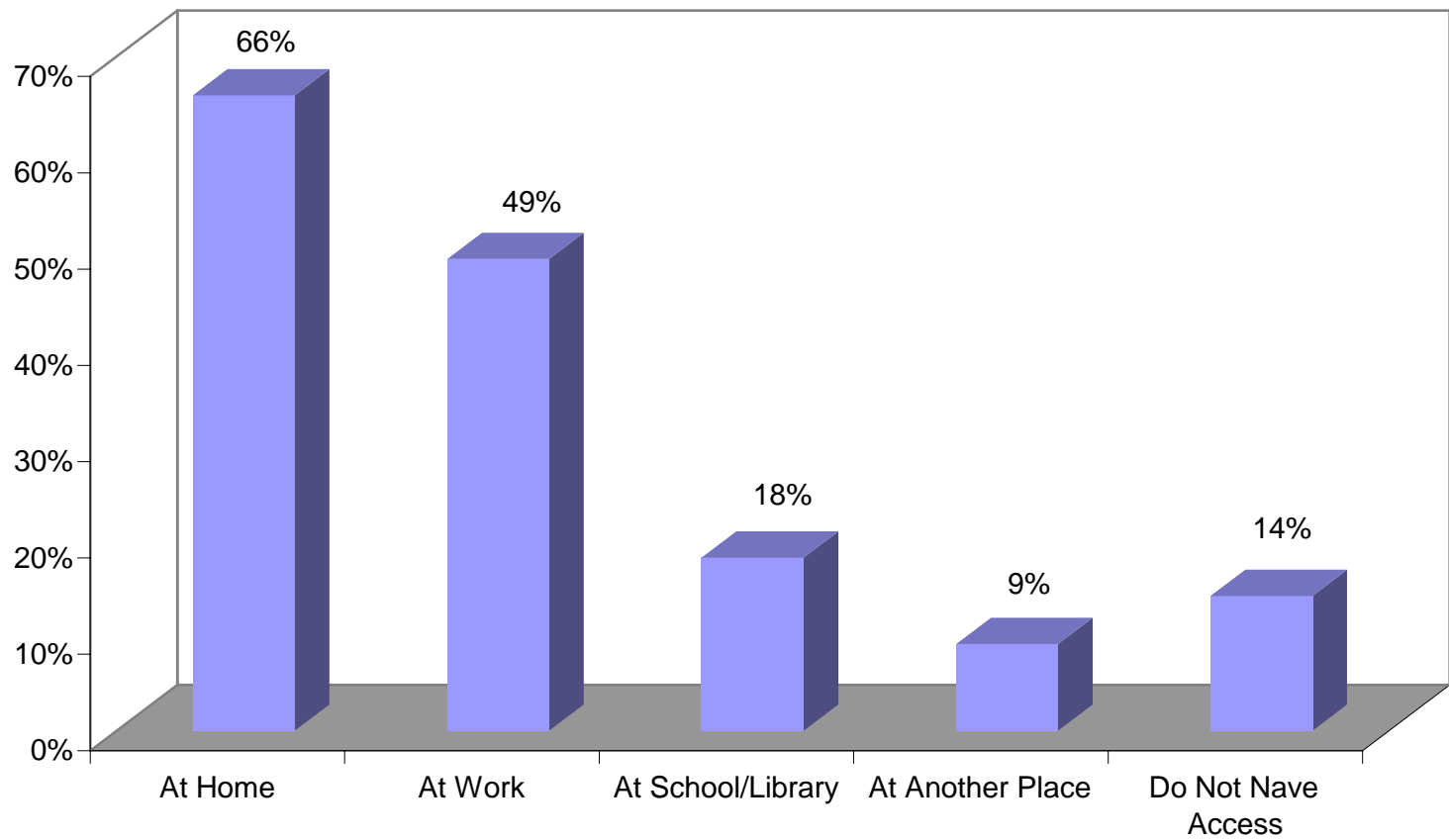
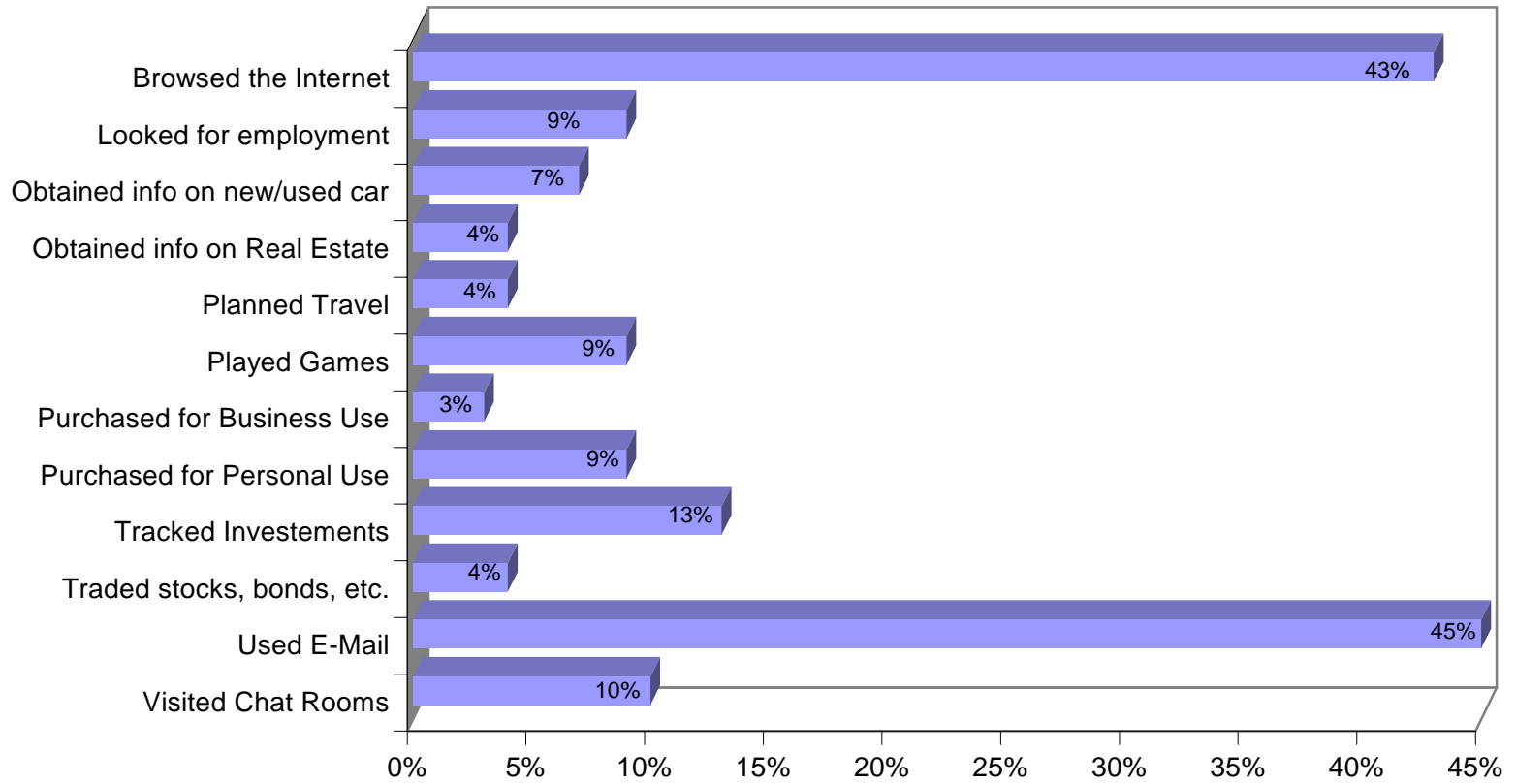


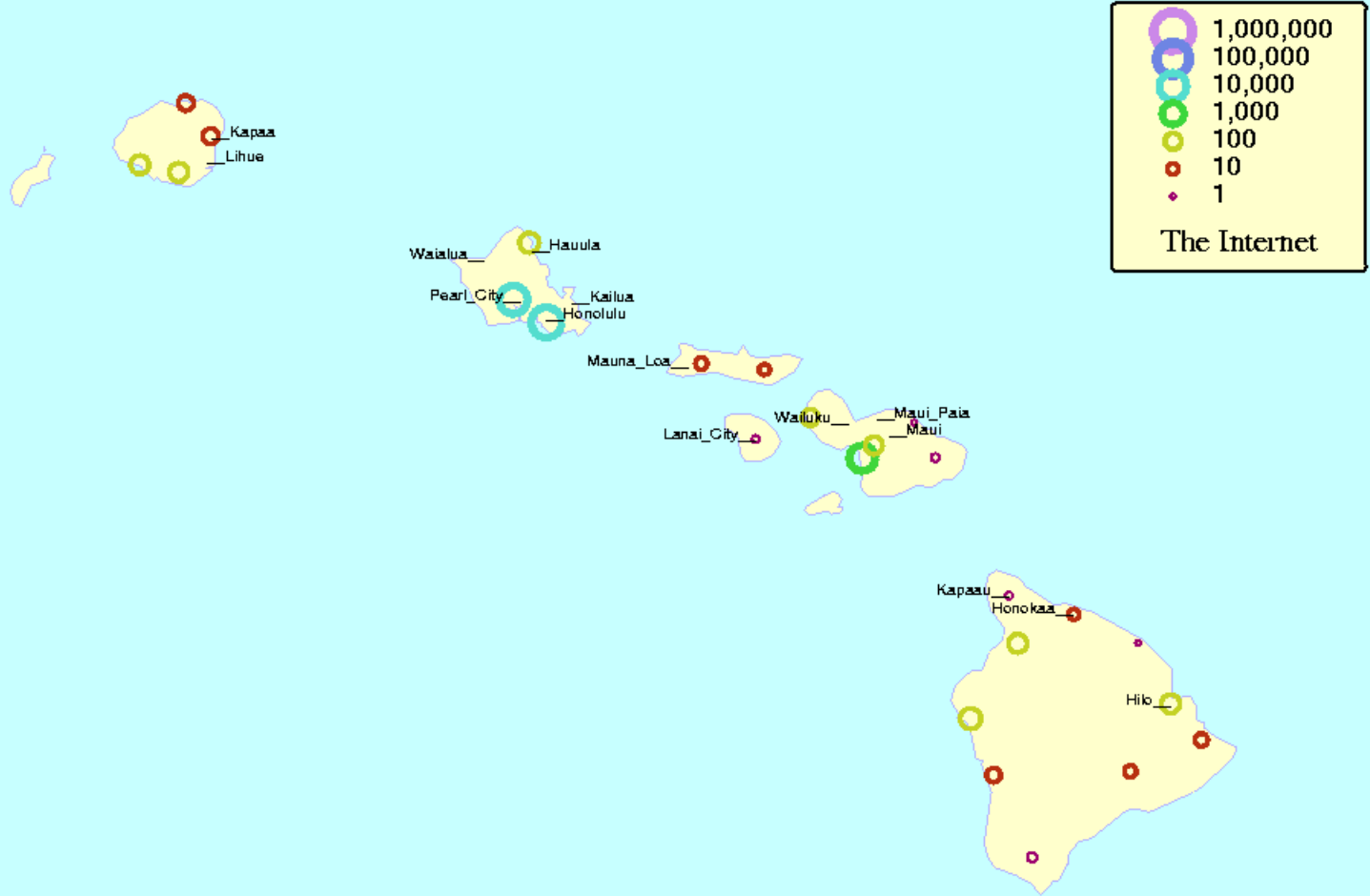
Figure . Where Hawai'i Adults Access the Internet (Source: SMS Hawai'i Market Study, 1999)

Hawai'i Adult Internet Surfer Usage
(Source:SMS Hawaii Market Study, 1999)



The Internet Jan 1999

Hawaii



+1-512-451-7602 fax +1-512-452-0127

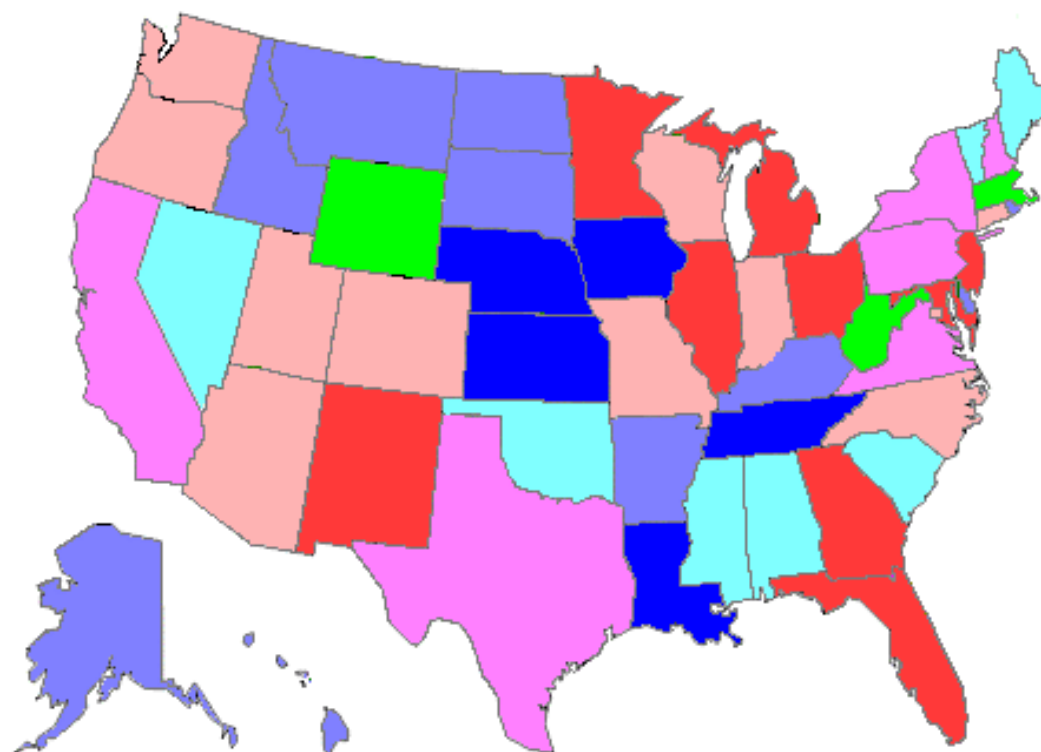
Copyright (c) 1999 MIDS Austin, Texas, USA

<http://www.mids.org> mids@mids.org

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Hawai'i and the Internet in the United States

January 1999 (Source: www.mids.org)

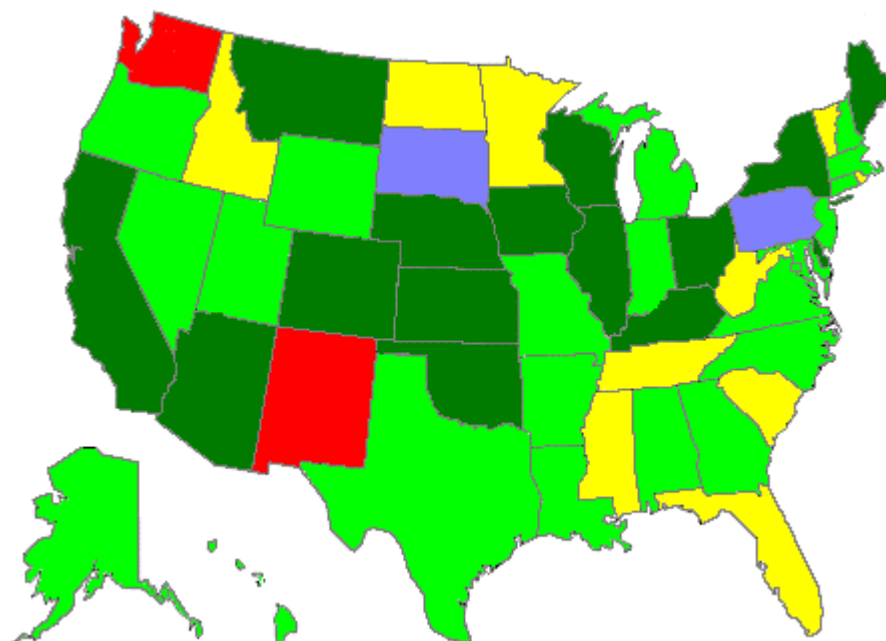


Number	8,001-16,000	16,001-32,000	32,001-64,000	64,001-128,000
Of Hosts	128,001-256,000	256,001-512,000	512,001-1,024,000	Over 1,024,000

The Figure above depicts the number of Internet hosts in the U.S.A. in January 1999. Hawai'i belongs to the third category with a number of Internet hosts between 32,000-64,000. This estimate is actually rather encouraging given the small population of the Aloha State.

Growth Rates of The Internet in the United States

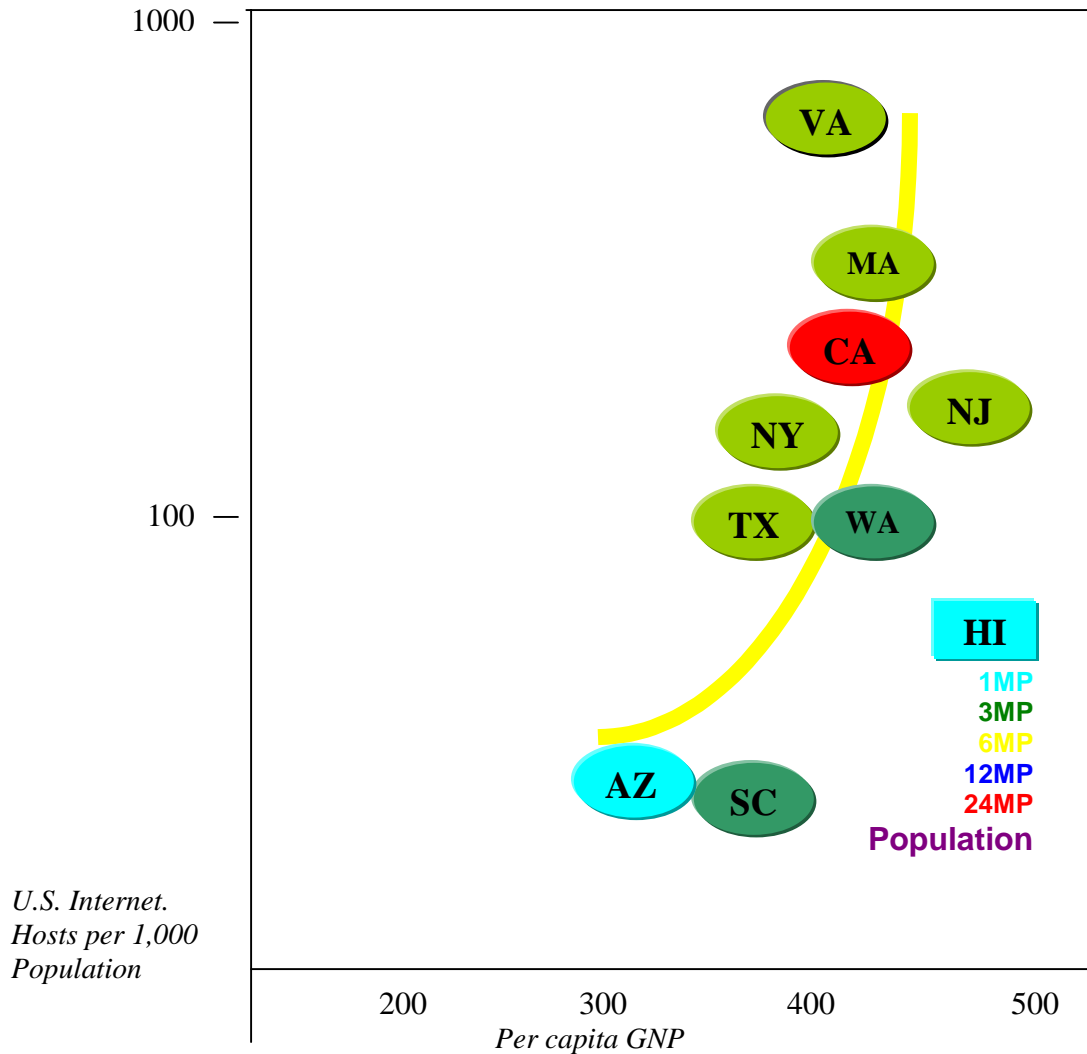
January 1988 -- January 1999 (Source: Martrix.Net Inc.)



As an indication of how early and how responsive is Hawai'i in adopting the Internet, the Figure above provides the growth rates by state in 1998. With a growth rate in the green category, Hawai'i is ahead of 14 states to align with Alaska, Oregon and Texas.

Hosts per Capita (1000): Hawai'i Compared With Other High-Tech States in the USA

(Adapted from Matrix.Net Inc.)

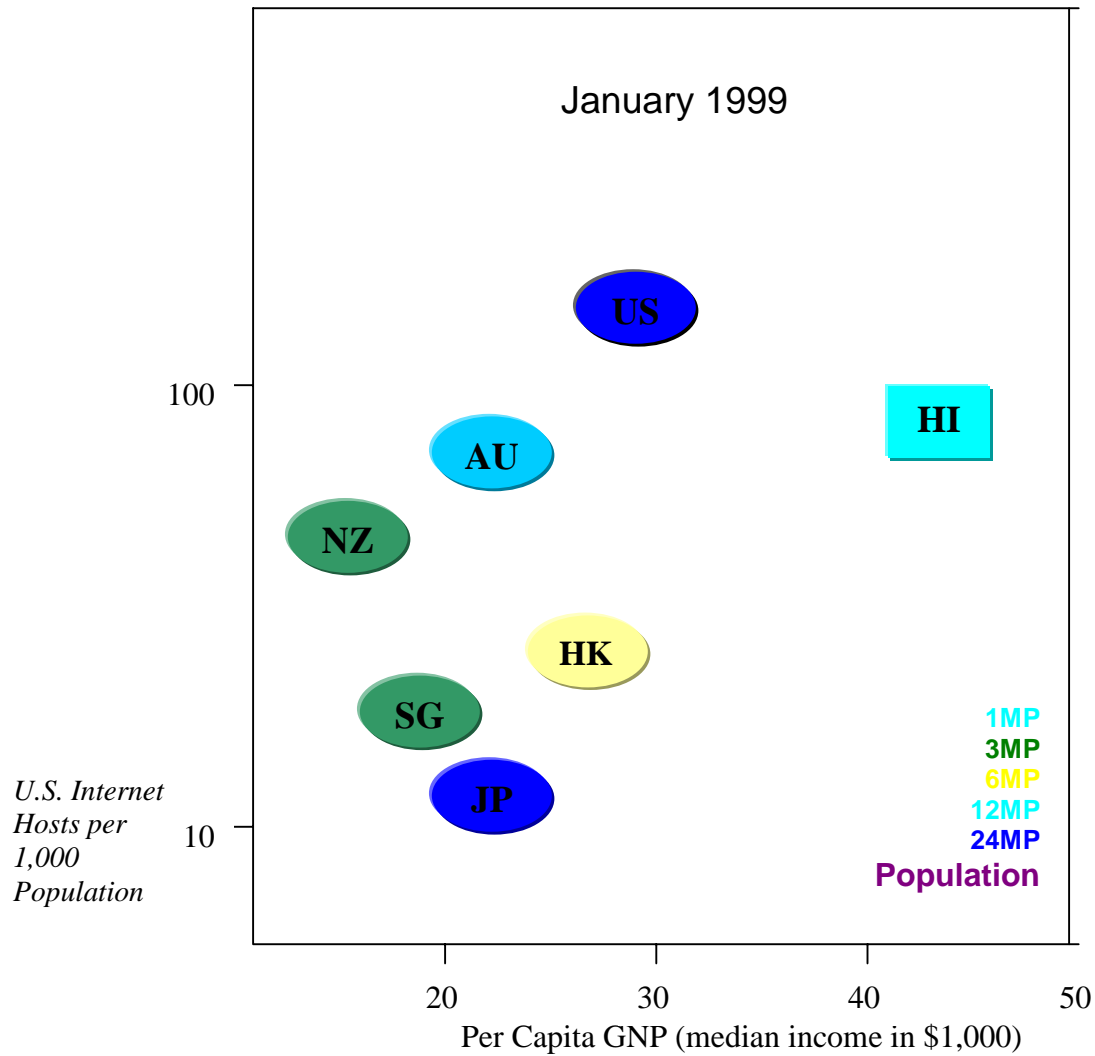


In terms of the number of Internet hosts per capita, Hawai'i scores relatively well. It trails behind the high-technology states. But, it is significantly ahead of Arizona, Arkansas and South Carolina.

In 1997, the median annual household income in Hawai'i was \$41,832, ranked 7th highest of the 50 states and the District of Columbia)

Discounting the high cost of living – estimated to be 27% for a family of four – for a comparable standard of living, Hawai'i positions itself well in the company of well connected states.

The Internet Hosts per Capita (1000): Hawaii Compared with Asian Pacific Countries, (Adapted from Matrix.Net Inc.)



As the Aloha State positions itself as a bridge between East and West, Hawai'i is leading the major economies in the Asia-Pacific region in terms of the number of Internet hosts per capita.

Honolulu is an expensive place to live. Still, it enjoys the lowest cost of living when compared to its Asian counterparts. The capital of Hawai'i is poised to become a cost-effective international gateway.

Honolulu	100
Sydney	113
Hong Kong	150
Singapore	133
Tokyo	183
New Zealand	n/a

Cost of living in 1996
(Source: Economist Intelligence Unit)

Findings

There are certain factors that contribute to what we call an e-business climate. Silicon Valley is undoubtedly the most cited example for an “e-business friendly” environment. In such an environment, people, money, technology and ideas meet and interact to promote new patterns of change or growth in the new technology-based economy.

Although not impossible, it would be difficult to duplicate the uniqueness of Silicon Valley and its unprecedented success. However, with the new global information infrastructure and the globalization of the world economy, it is yet possible to become a center of excellence as a part of the global silicon network.

Some General Perceptions about Hawai'i's E-business

The Table on page 31 quotes some of the most frequently stated opinions of the 31 key business leaders interviewed about the e-business climate in Hawai'i. These quotes exemplify the current perceptions about e-commerce in Hawai'i. The state of e-commerce in Hawai'i is at worst puzzling and at best in a shifting mood.

Actual situation of e-commerce:

Thirty percent of the interviewed leaders said that e-commerce in Hawai'i is in a high growth mode. One third think that e-commerce in Hawai'i is still in its infancy. Interestingly, 30% think differently. They claim that e-commerce in the State has passed the initial stage of technology awareness and experimentation with e-technology. And indeed, they contend that Hawai'i is now in the growing stage. The opinions are widespread, showing that the business community does not completely agree about how far Hawai'i really is into e-commerce.

Sixty two percent of the interviewees find that Hawai'i is behind the Mainland in terms of e-commerce. The rest cannot see any difference between Hawai'i and the Mainland. Actually, when asked “What first comes to mind when we refer to the Mainland?”, respondents tend to look at California as a point of reference.

Forty five percent of the interviewed people think that large businesses are ahead of their smaller counterparts. Two reasons were cited: It is harder for small businesses to have the infrastructure and funding. Another reason is that most of Hawai'i businesses are not publicly traded, and therefore do not feel public pressure to go into e-business.

Thirty five percent think that top businesses in Hawai'i have yet to catch up with the latest e-commerce technology. Ten percent of the interviewees respond that small and big businesses are in the same stage, and ten percent find that company size has not much to do with how well the company is moving in the digital economy. Rather, it is an issue of company strategy. This perception corroborates with the online survey. The correlation between the size of the company and the number of years that they have their own Web business is low ($R=0.24$).

E-commerce Outlook

To successfully launch an e-business, the company needs the infrastructure, funding and a skilled workforce. Most importantly, the company needs to have a forward-looking and flexible decision making framework that allows it to quickly act and react to market changes. In this regard, most respondents agree that small businesses, with their structural flexibility, should have a distinct advantage in a new economy.

All but one interviewee (95%) think that the target market should be local, national and international. The decision depends on the type of e-business and the targeted customers. Perhaps the most compelling business reason to go online with a local market is efficiency. New technology could help reach the (local) customers more conveniently and reduce operational costs. However, if the potential of e-commerce is to be fully exploited, companies that embark on e-business should explore new markets, those that go beyond the existing markets.

There is a general consensus that Hawai'i businesses are aware about the new economy. Interviewees tend to agree that local businesses have to catch up or they will not prosper. Competition will be increased due to globalization driven by Internet commerce. Companies in Hawai'i that are unable to adjust their business to the reality of the new economy will probably not survive.

Some Perceptions of E-Business Climate in Hawai'i

	Upbeat Perspectives	Critical views
High-Technology Environment	<p>“Current government is very supportive of high-tech industry and business”</p> <p>“It is very convenient for companies to tap into advanced telecommunications and computer infrastructure”</p>	<p>“Businesses have yet to fully understand the real potential of the technology they have”</p> <p>“There is a mental block here. Quite a few people have a “Can’t do” attitude”</p>
Human Capital	<p>“The multicultural nature of people can be an advantage if you know how to leverage its potential”</p> <p>“Salaries are low, thus a crucial savings for companies that hire them”</p> <p>“There is a perception that there might be a shortage of world-class labor to start new e-businesses. But in fact, they are here”</p>	<p>“You can’t find enough technical, marketing and business expertise in Hawai'i”</p> <p>“Labor unions are very strong”</p> <p>“Change process is slow”</p> <p>“Mix of cultures sometime causes communication problems”</p> <p>“Hawai'i is not the very best place to do e-commerce... the nature of the Internet is global.”</p>
Venture Capital	<p>“Hawai'i is a small marketplace, so it is easy to approach the major players”</p> <p>“New high-technology laws and incentives are encouraging.”</p>	<p>“The taxes are high and there are a lot of regulations”</p> <p>“It’s hard to get funding and venture capital if you are not well connected”</p> <p>“If you start something uncommon, you face a lot of skepticism whether it is from the law or the banking community”</p>
Technology and Business Alliances	<p>“Because Hawai'i is ... isolated, you can try new “things” here without making lots of noise until the project takes off.”</p>	<p>“There are not many alliances or partnership between companies in Hawai'i”</p>

Micro-Economic Study: Current Practices of E-business in Hawai'i

In order to better understand the e-performance of Hawai'i businesses, we have devised a number of evaluation dimensions at the enterprise level. In particular, we propose various concepts to test the level of sophistication of the firms from the point of view of their presence on the Internet, their business strategies and their marketing approaches.

- Some profiles of current E-commerce in Hawai'i
- Hawaiian Internet Access Providers
- Web-Presence metrics
- The practice of e-commerce – sales and investment
- E-competitiveness
- E-marketing
- Experts' recommendations for starting an e-business in Hawai'i

We believe this is a first attempt known to date to provide a comprehensive framework to study the performance of e-businesses. As such, we have no data to compare with other non-Hawaiian firms.

Hawai'i Internet Access Providers

There is no shortage of Internet Access Providers (IAP) in Hawai'i. Since November 1997, Oceanic Cable has offered a high-speed Internet access called Road Runner, which is up to 100 times faster than a dial-up line using its own broadband fiber-optic coaxial network. The number of subscribers doubled in 1999 and has reached 26,000 in April 2000. Ninety seven percent of the subscribers are residential customers.

CNET Hawaii	www.cnethi.net
Commercial Data Systems, Inc.	www.oahu.net
Cyber City Honolulu, Inc., Honolulu	www.cchono.com
Data Plus Systems	www.dps.net
Digital Island	www.digisle.net
FlexNet Inc.	www.flex.com
GST Hawaii Online, Honolulu, Wailuku, Hilo, Kaunakakai, Lanai, Wailuku,	www.aloha.net
GTE Internet	www.gte.net
Hawaii Aloha InterNet, Inc, Kona	www.hialoha.com
Hawaii Internet Systems, Kahaluu	www.hi.net
Hawaii Internet Technology Solutions	www.hits.net
Hinet Homepage	www.teamunlimited.com
HulaNet, Inc	www.hula.net

Internet@vantage Inc, Honolulu	www.iav.com
Inter-Pacific Network Services	www.interpac.net
Kauai Internet, Waimea, Kihue	www.hawaiian.net
Keystroke Communications, Inc	www.keystroke.net
LavaNet, Inc., Honolulu, Lihua, Hilo, Kahului	www.lava.net
Maui Gateway, Kihei	www.mauigateway.com
Maui Net, Inc., Kihei, Wailuku, Kahului	www.maui.net
Oceanic Cable	www.oceanic.com
Pacific Area Networks, Inc.	www.panworld.net
Pacific Global Communications, LLC, Honolulu, Hilo, Lihue, Waimea, Kihei, Wailuku, Kahului,	www.pacificgolbal.net
Pacific Information Exchange, Inc., Honolulu	www.pixi.com
Pacific Onramp, Inc.	www.poi.net
Road Runner	www.hawaii.rr.com
SliderNET, Honolulu	www.slider.net
StarrTech Interactive	www.starrtech.com
Vision Imaging, Inc.	www.viis.net

E-Business Performance Framework

Evaluation Sample

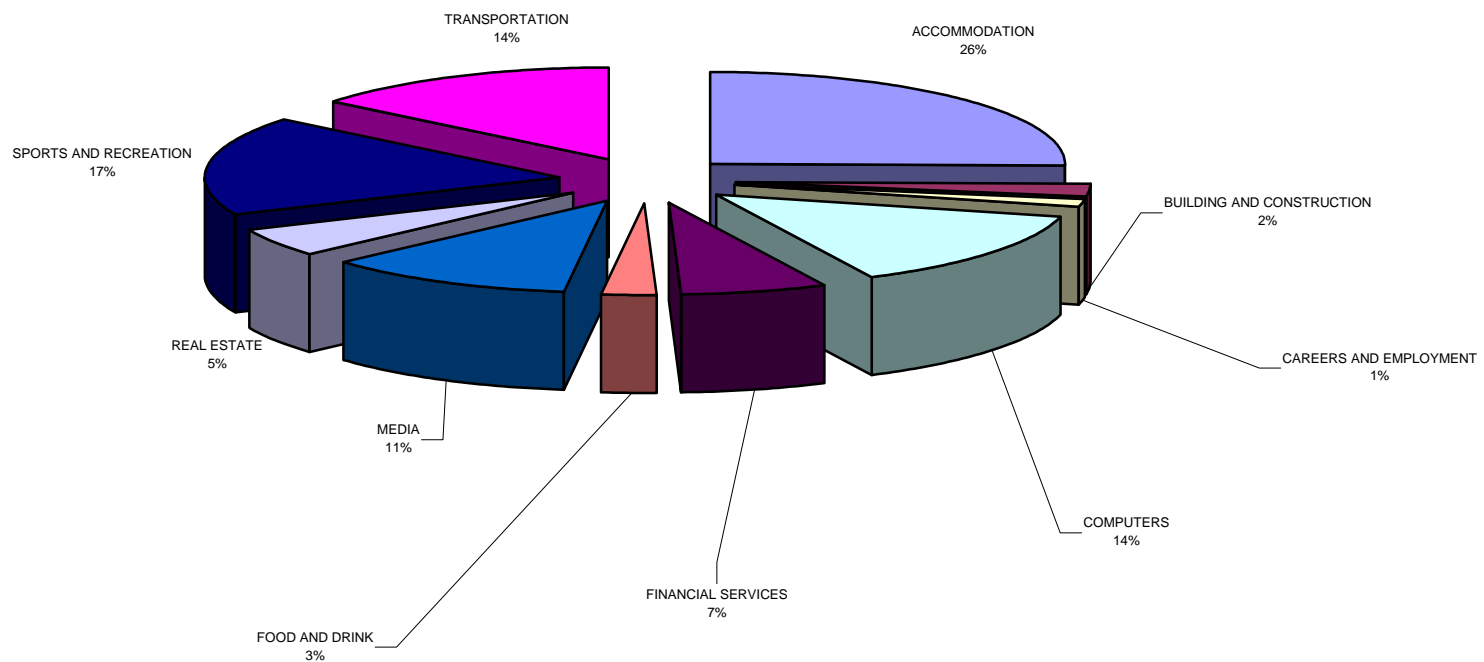


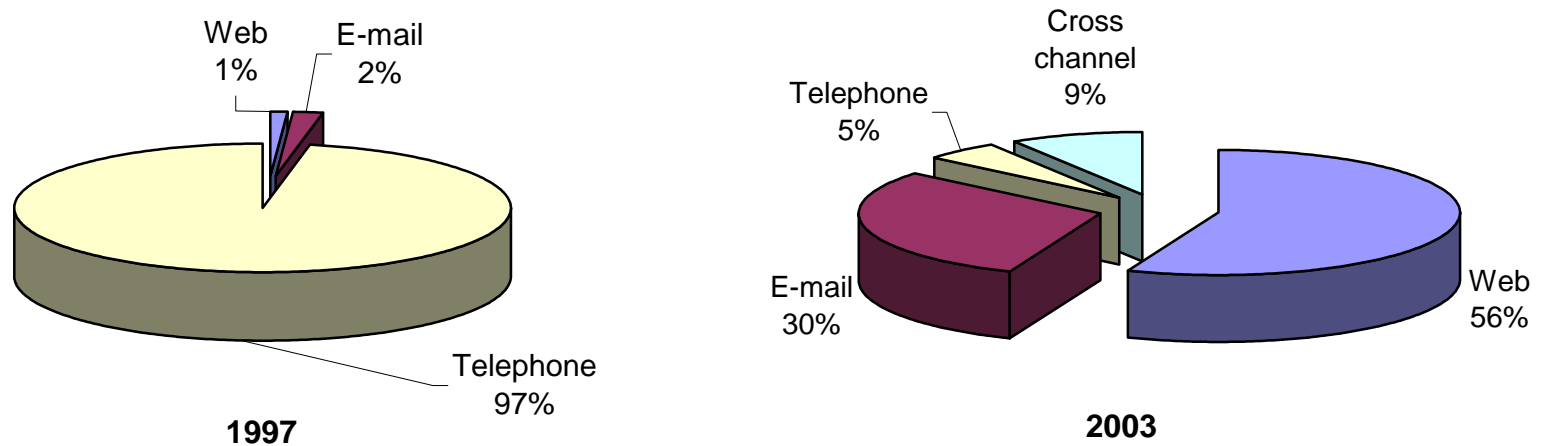
Figure . Types and Number of Business Surveyed (n=409)

The distribution of the sectors shows the importance of tourism in Hawai'i. More importantly, it also confirms the findings elsewhere in this report that most Hawai'i businesses view e-business as a further extension of their traditional business.

Web-Presence

Web-presence is the first step in reaching cyber market.

The simplest and least expensive form of Web-presence is to contact customers via e-mail. The most sophisticated form is to achieve full integration electronically with all business partners - from suppliers to customers.



The figure above indicates the change of communication mode between businesses and their clients. By 2003, e-mail and the Web will be the primary means of interaction with future customers.

We surveyed Hawai'i's businesses along the following Web-presence spectrum:

- E-mail
- Product and Company Information
- Online catalog
- Customer feedback from
- Online ordering
- Online payment
- Links to other business-partners

E-mail Address

Compared to the other sectors Transportation has the lowest percentage (87.93 percent) of Web sites that provide the customer an E-mail address. Food and Drink, and Computers follow with 90.91percent and 91.23percent. Building and Construction, Careers and Employment, and Real Estate have the highest percentage (all 100 percent) of Web sites containing an E-mail address.

Product and Company Information

Computers, Media, and Transportation are the only sectors that have less than 100 percent of Web sites containing product and company information. The numbers are 94.74 percent, 95.65 percent, and 96.55 percent, respectively.

Online Catalog

Accommodation, and Building and Construction are the leaders in terms of percentages of Web sites (88.35 percent and 88.89 percent) with an online catalog. Financial Services and Media have the lowest percentage: 59.26 percent and 56.52 percent.

Customer Feedback Form

The percentage of Web Sites providing a Customer Feedback Form is generally low with an average of 33.89 percent. However, the leading sectors, Accommodation, Financial Services, and Real Estate, reach percentages high above the average: 51.46 percent, 44.44 percent, and 47.62 percent, respectively.

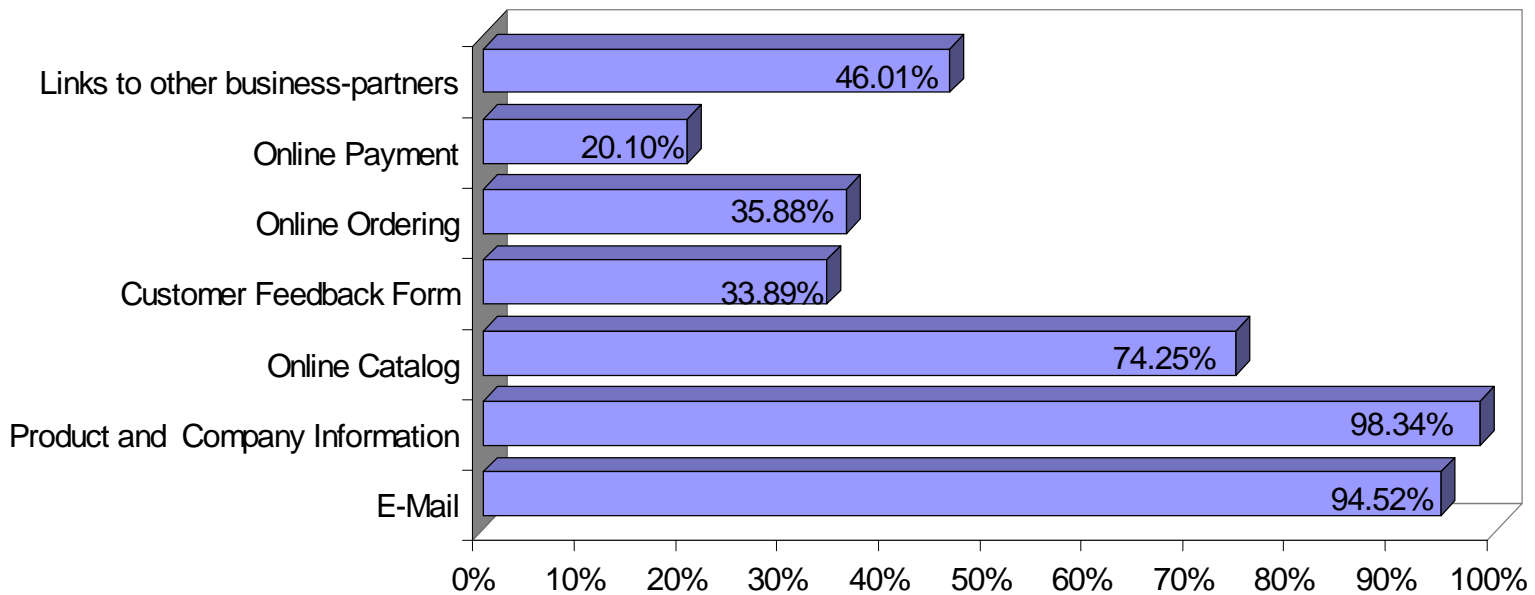
Careers and Employment, Food and Drink, and Sports and Recreation fall far below the average with 16.67 percent, 9.09 percent and 22.54 percent, respectively.

Online Ordering

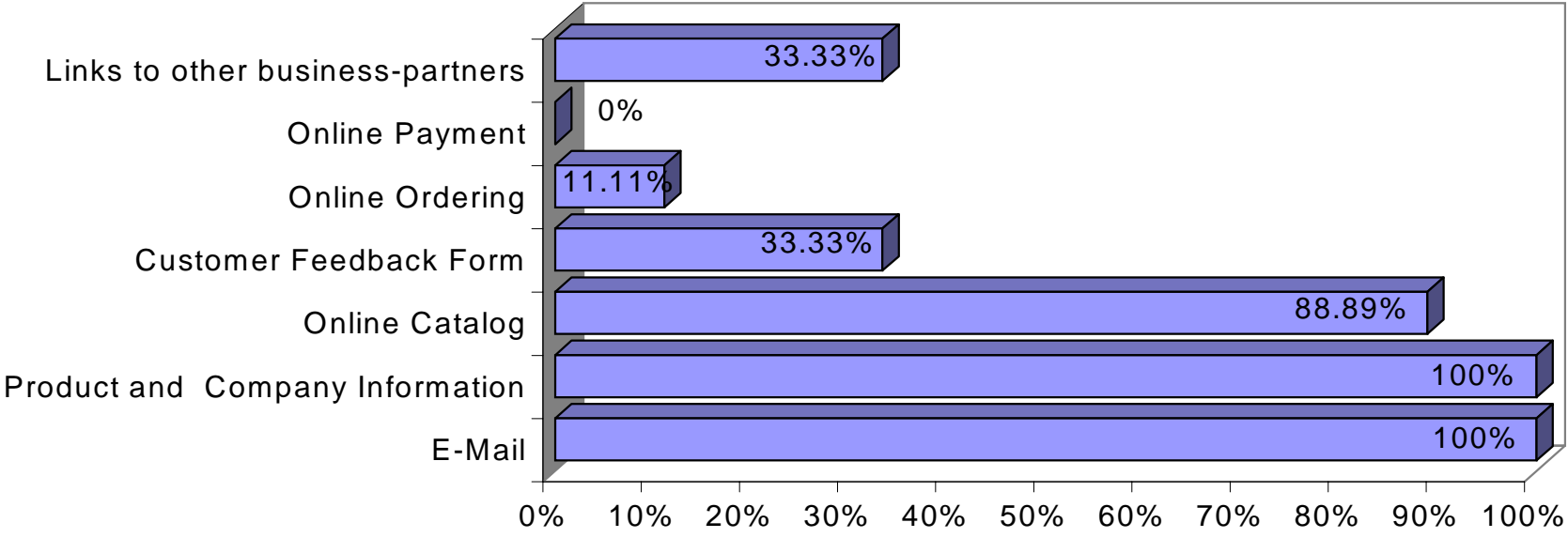
Accommodation, Computers, Media, and Transportation have the highest percentages in terms of Online Ordering. Transportation leads with 56.90 percent. Then comes Media with 45.55 percent, followed by Computers with 43.86 percent and Accommodation at 42.72 percent. These are all industries with a lot of competition from within the state of Hawai'i as well as from outside. The low percentage for Real Estate (9.52 percent) can be explained by the fact that this industry deals with high impact goods which usually wouldn't be "ordered" over the Internet.

The next figures provide a detailed analysis of Hawai'i Web sites according to various economic sectors.

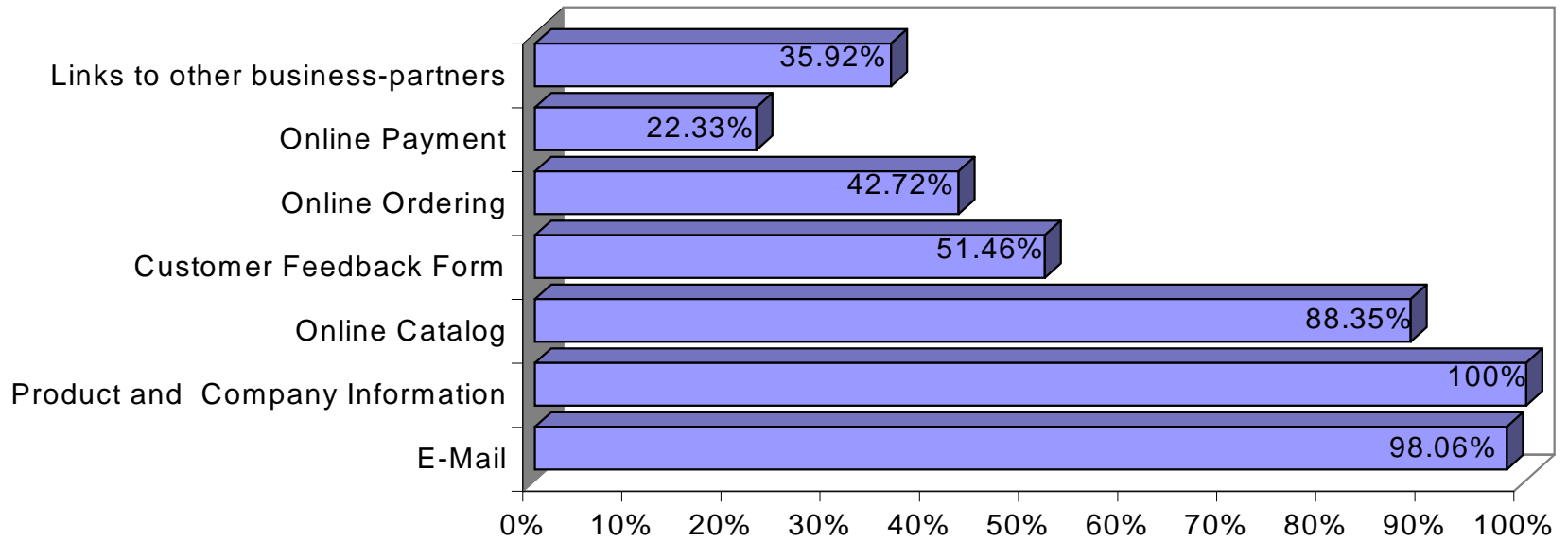
E-BUSINESS IN 10 MAJOR ECONOMIC SECTORS



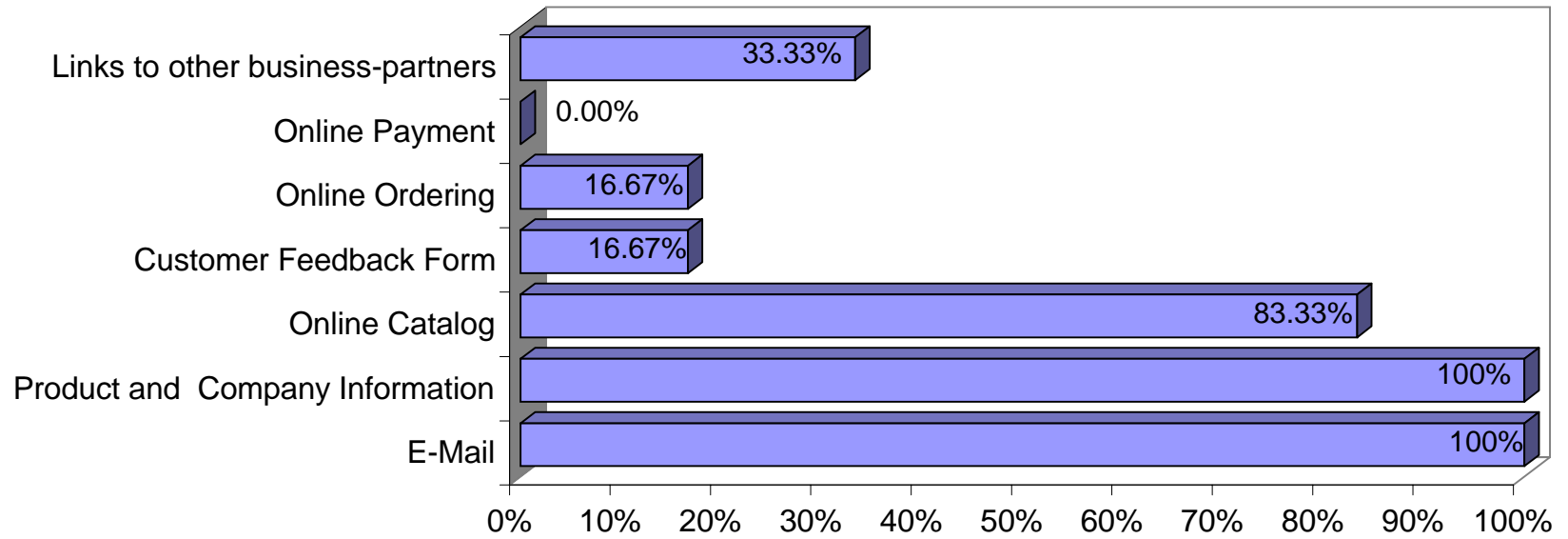
E-BUSINESS IN BUILDING AND CONSTRUCTION SECTOR



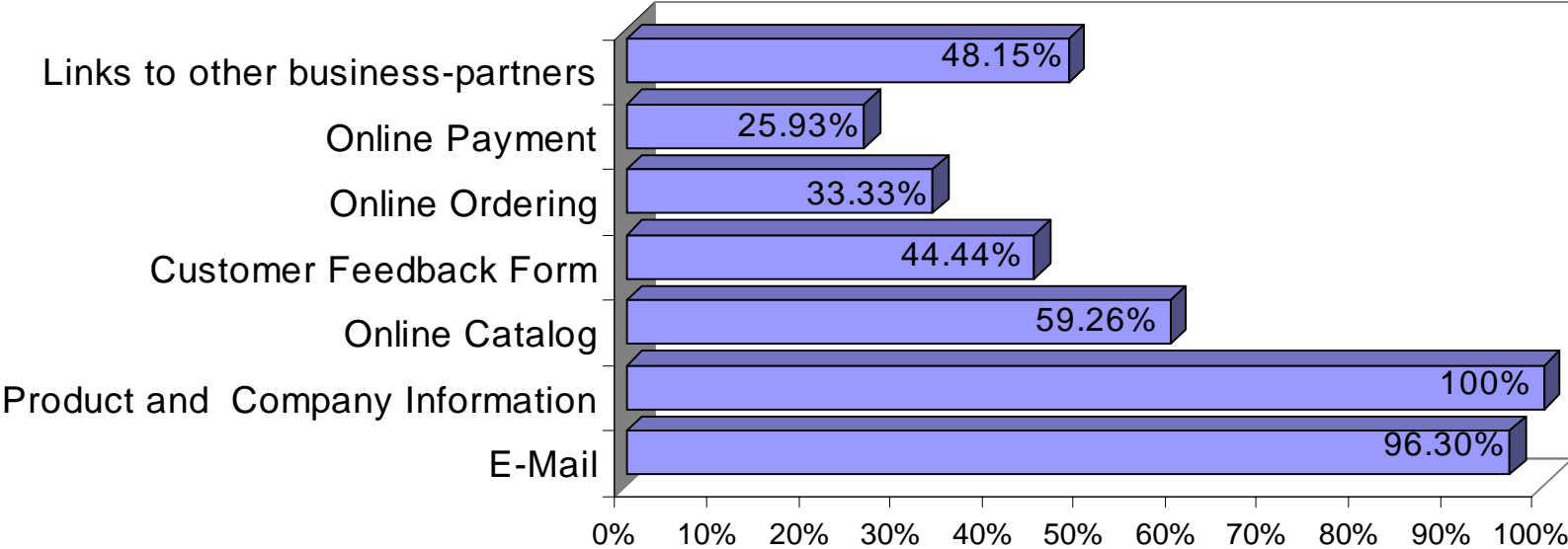
E-BUSINESS IN ACCOMMODATION SECTOR



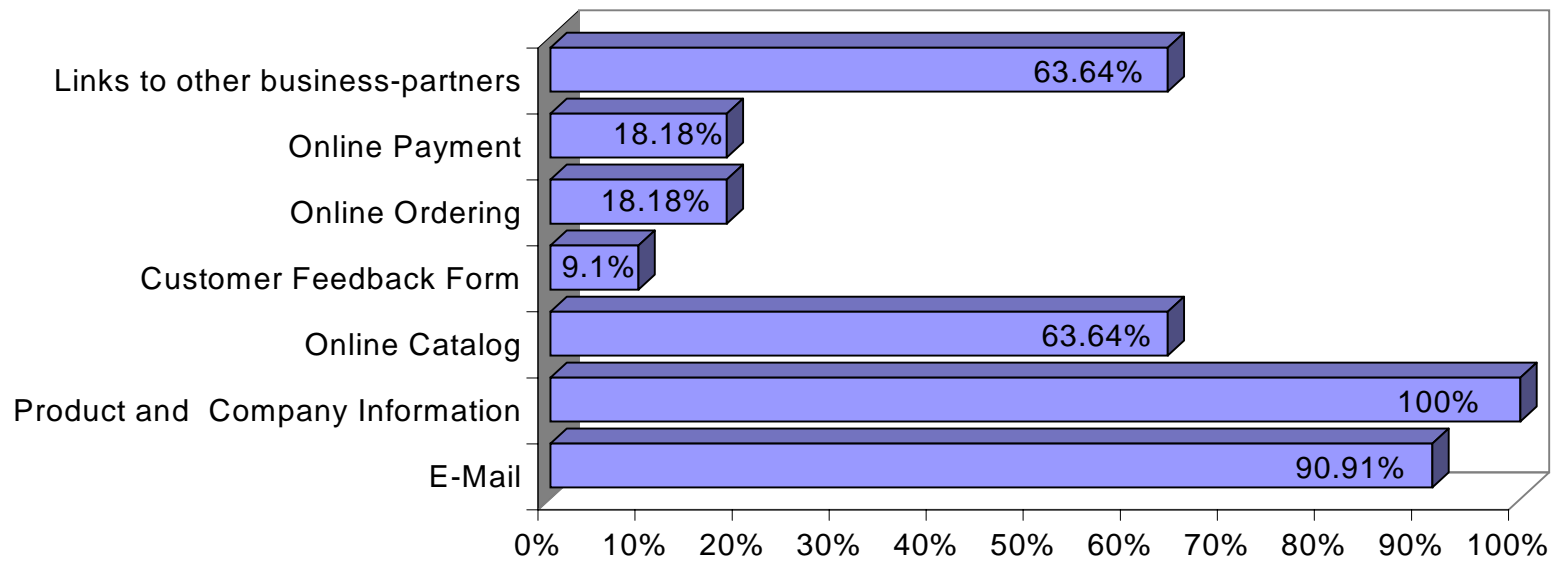
E-BUSINESS IN CAREERS AND EMPLOYMENT SECTOR



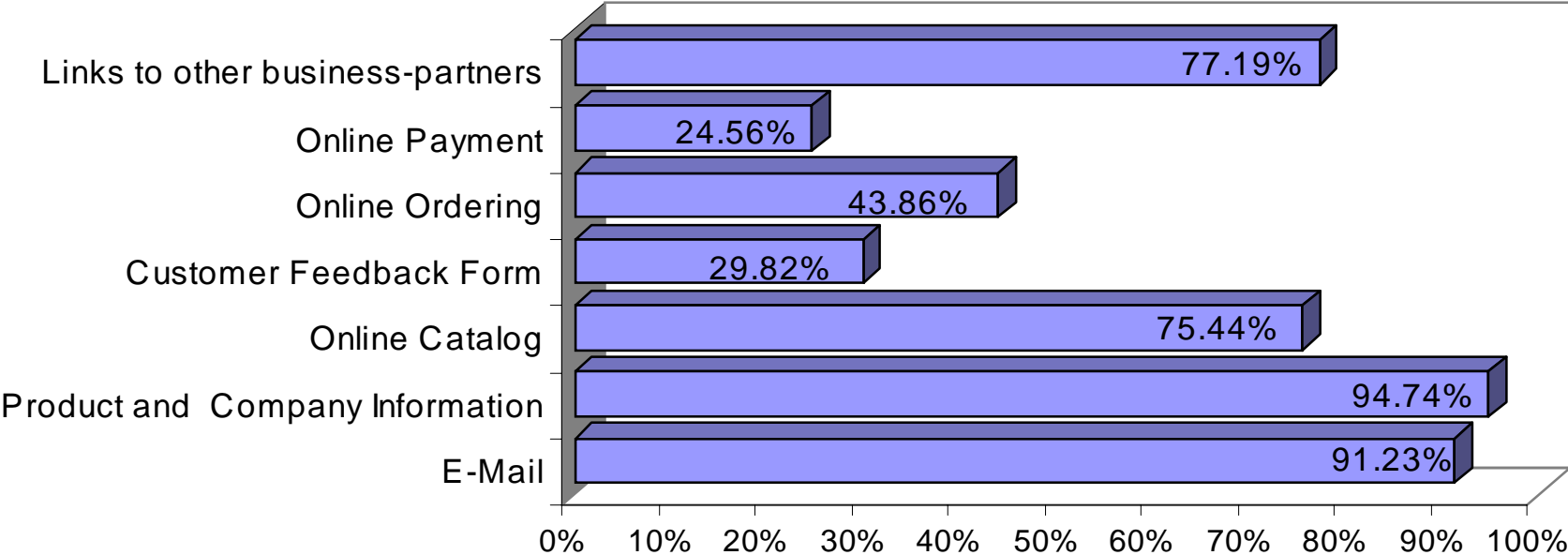
E-BUSINESS IN FINANCIAL SERVICES SECTOR



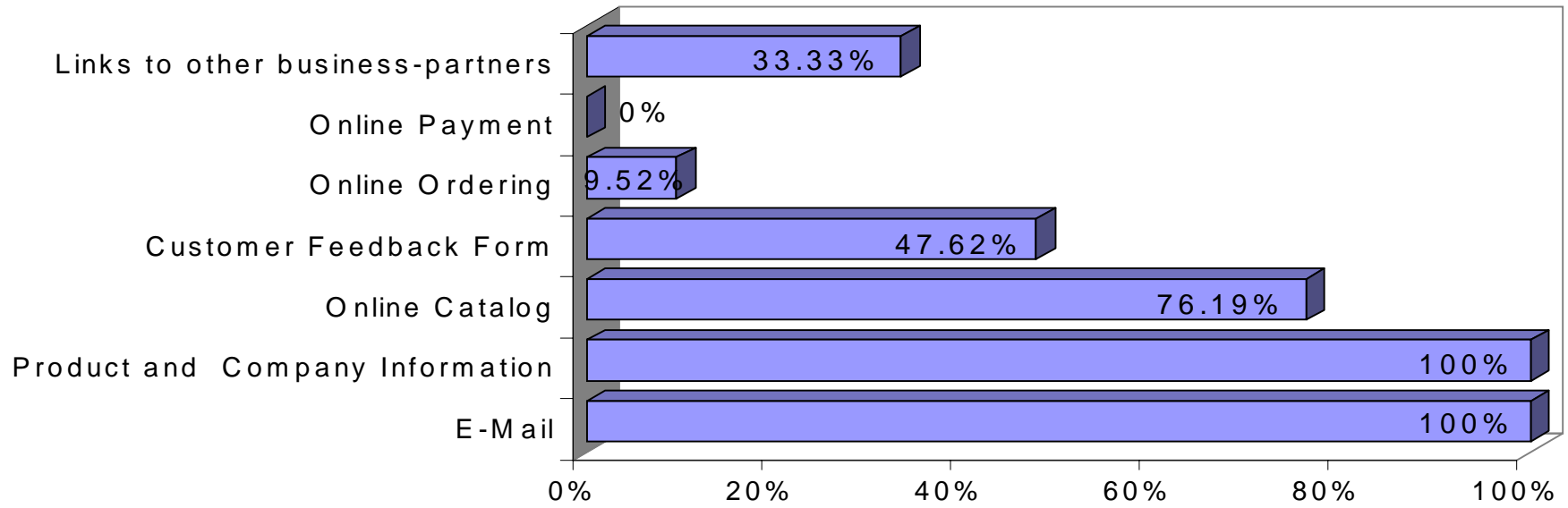
E-BUSINESS IN FOOD AND BEVERAGE SECTOR



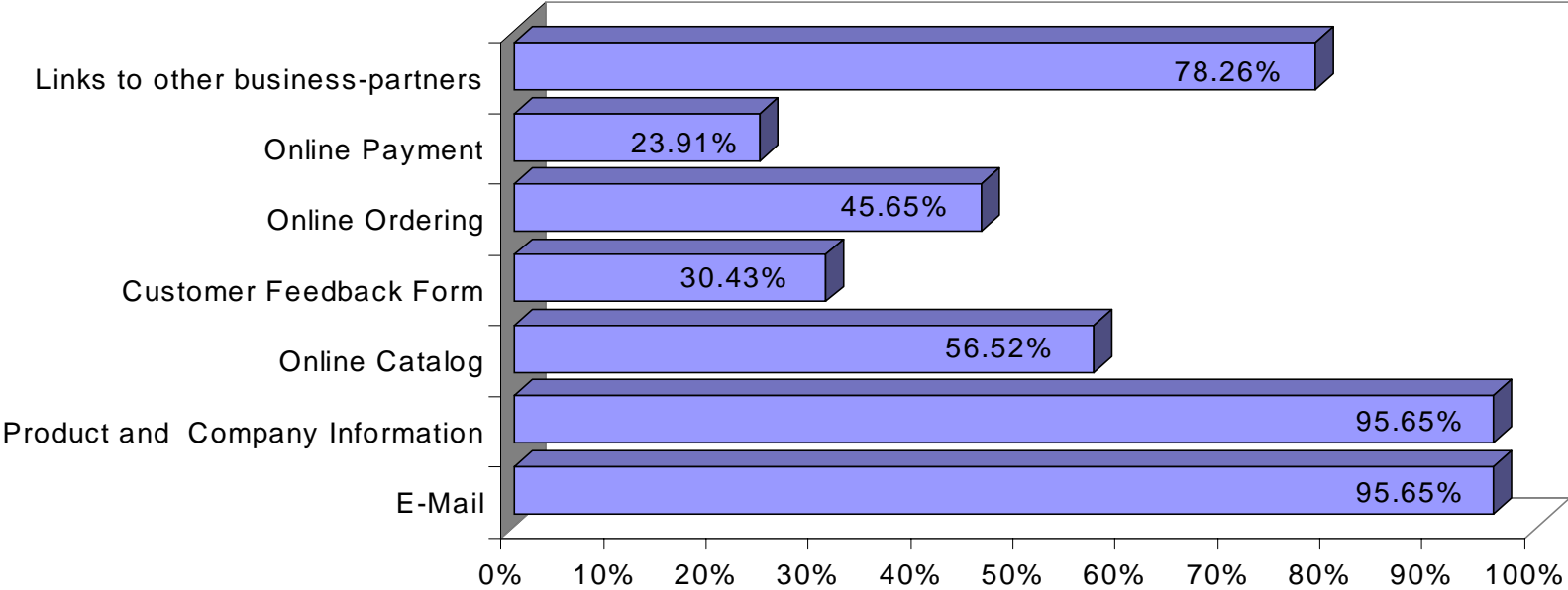
E-BUSINESS IN COMPUTERS SECTOR



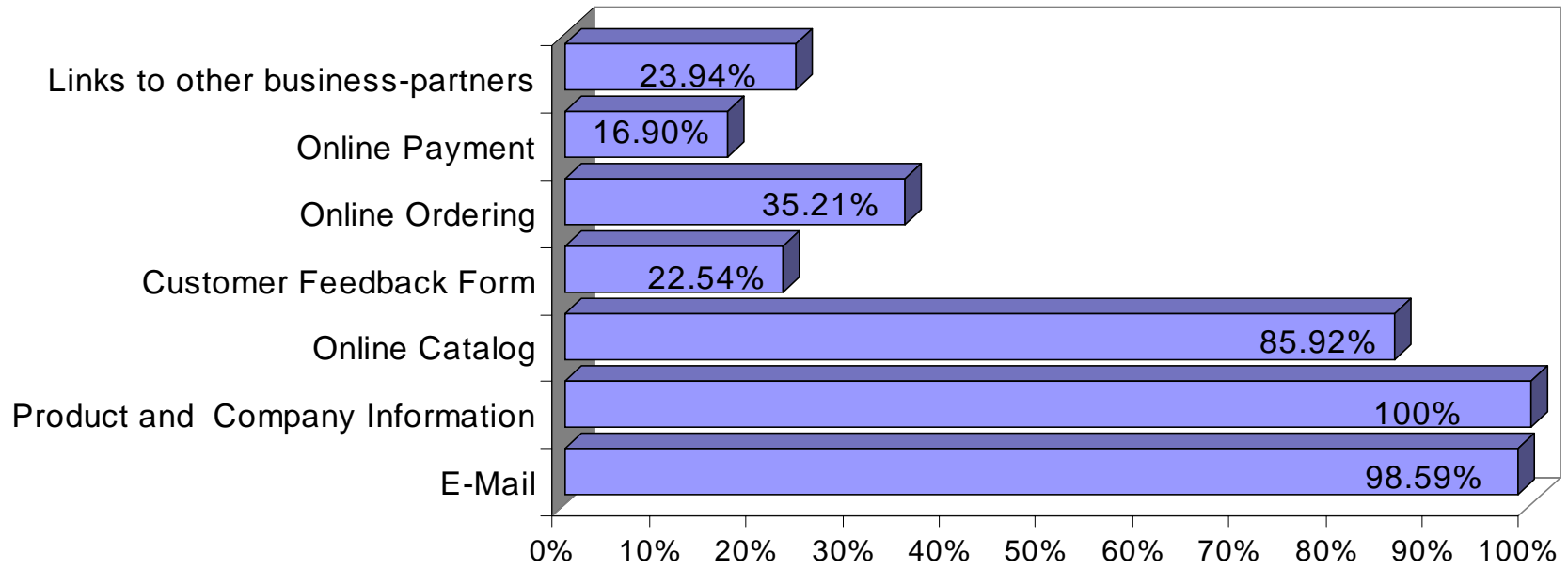
E-BUSINESS IN REAL ESTATE SECTOR



E-BUSINESS IN MEDIA SECTOR



E-BUSINESS IN SPORTS AND RECREATION SECTOR



Online Payment

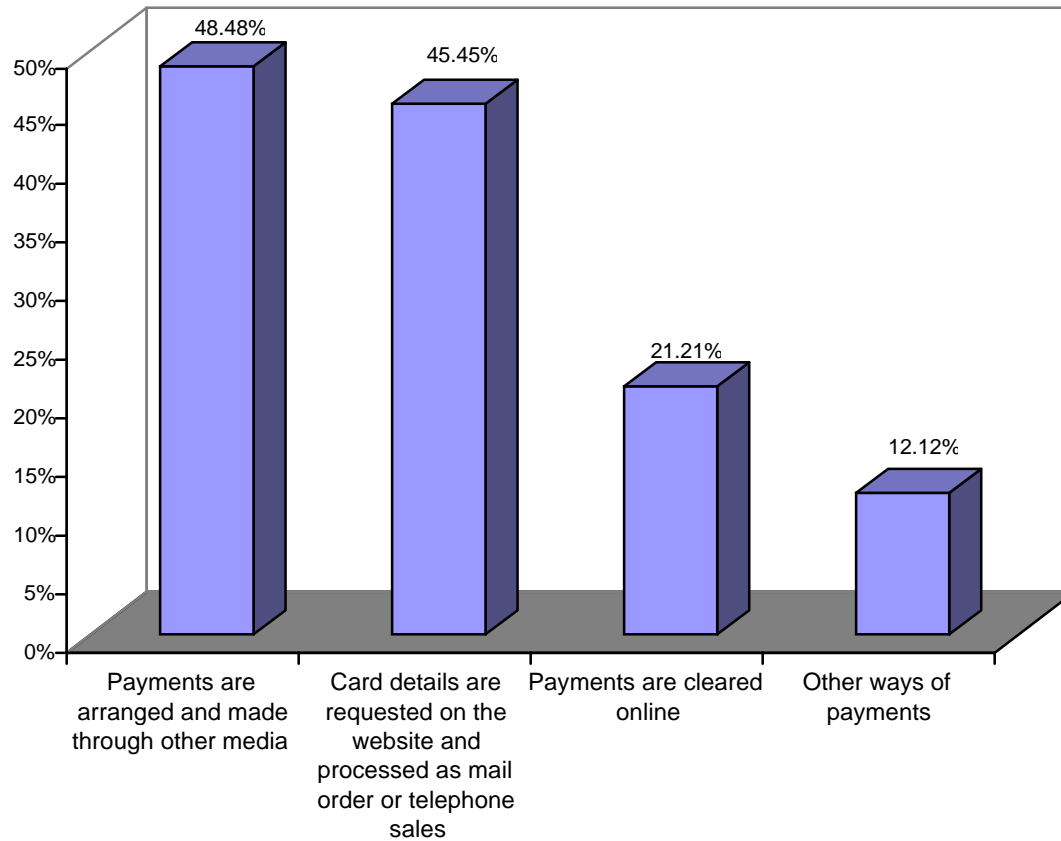
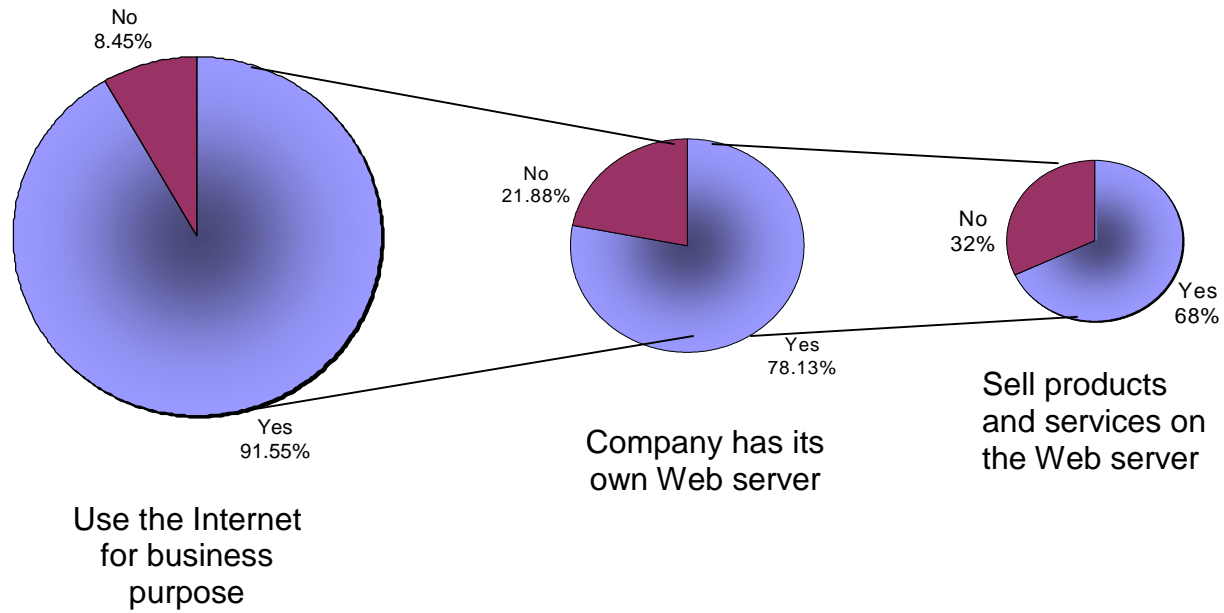


Figure. How Are Payments for E-purchases Managed? (n=33)

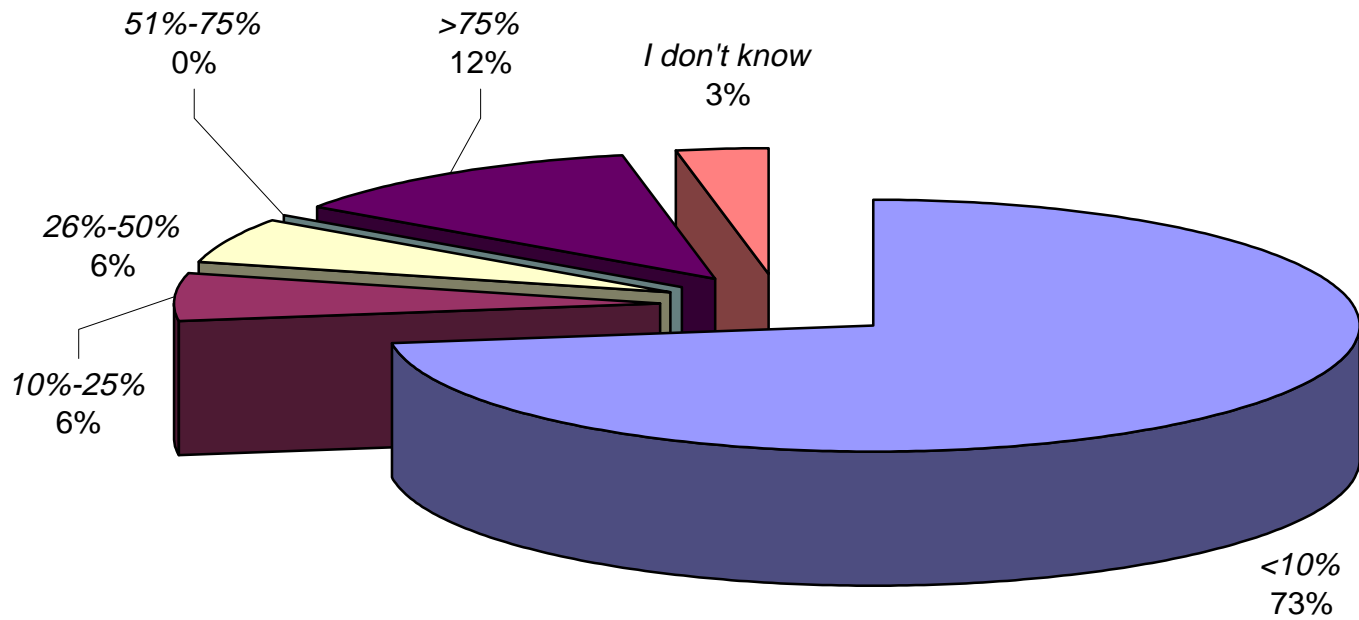
Transportation is the leading sector with 36.21 percent of Web sites providing the possibility of online payment. Other sectors with percentages above the average (20.10 percent) are Accommodation (22.33 percent), Computers (24.56 percent), Financial Services (25.93 percent), and Media (23.91 percent).

The Practice of E-Commerce

The next three figures show the profile of Hawai'i Web sites and their performance.

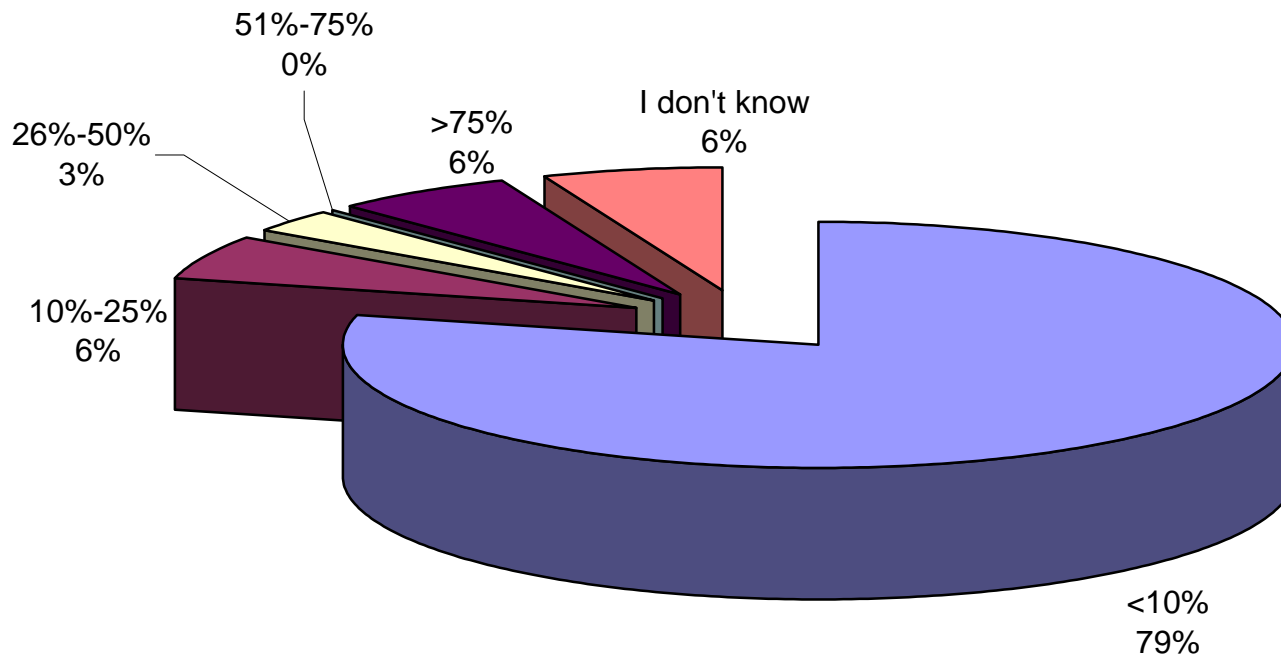


Percentage of Sales That Come As a Result of The Company's Website
(first line: % of sales; second line: % of respondents)



A closer look at the companies that reported a higher sales percentage include those dot-com's or large firms that have been doing e-commerce for more than three years.

Percentage of Sales That Are Invested In The Company's Website



E-Competitiveness

It is understood that the digital market will be extremely competitive due to globalization. Deciding to join the e-market is a major strategic decision. Deciding what form of e-competition is an even more complex one. Most Hawai'i companies in the appropriate sample (85 percent) stated that the move to e-business was a strategic one. There is a significant correlation between the company's strategic move to e-business and the time they entered the digital market place (more than three years in the sample population).

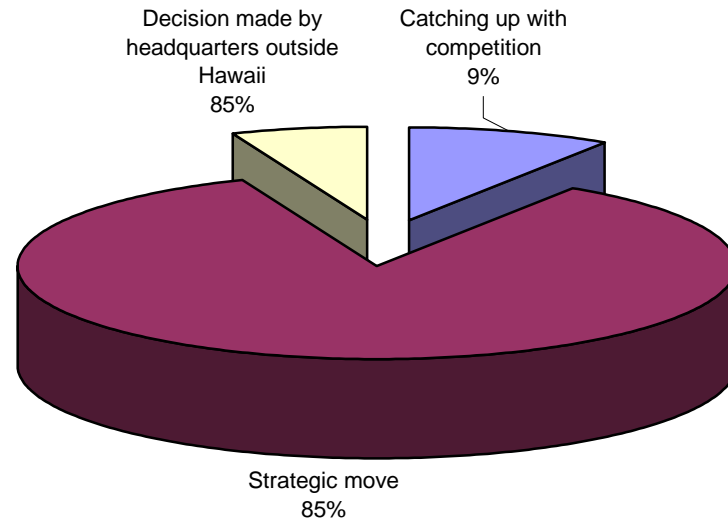


Figure . Reasons for Selling on Website (n=33)

Competitive Strategies

Strategically, the simplest rationale to justify the entry to e-commerce is to improve efficiency – i.e., reducing costs and increasing sales. In a fast changing market, increasing the number of customers requires companies to continuously monitor the market to regularly improve their products and services. In an expanded market, firms are required to capitalize on economies of scale (e.g., minimizing production cost per unit) and to provide their customers with a high level of personalization (e.g., delivering customized products; only flowers that would grow in a specific geographical location). This is typically done by combining advanced production systems with intelligent marketing systems.

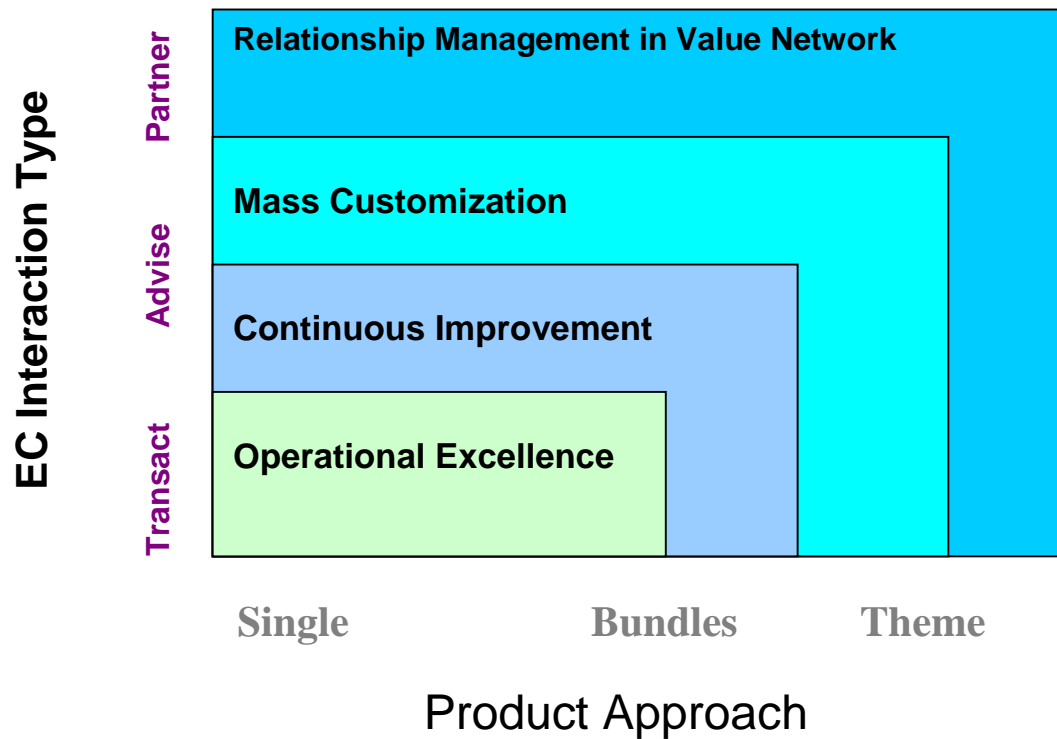
Along this spectrum of Web interaction, theory says there is an evolution in terms of e-business interaction type, from

- Simple transaction
- Advising (e.g., customer support) to
- Partnering (both vertical and horizontal integrations).

Also, for each type of Web interaction, any e-business can choose to offer in the e-market either:

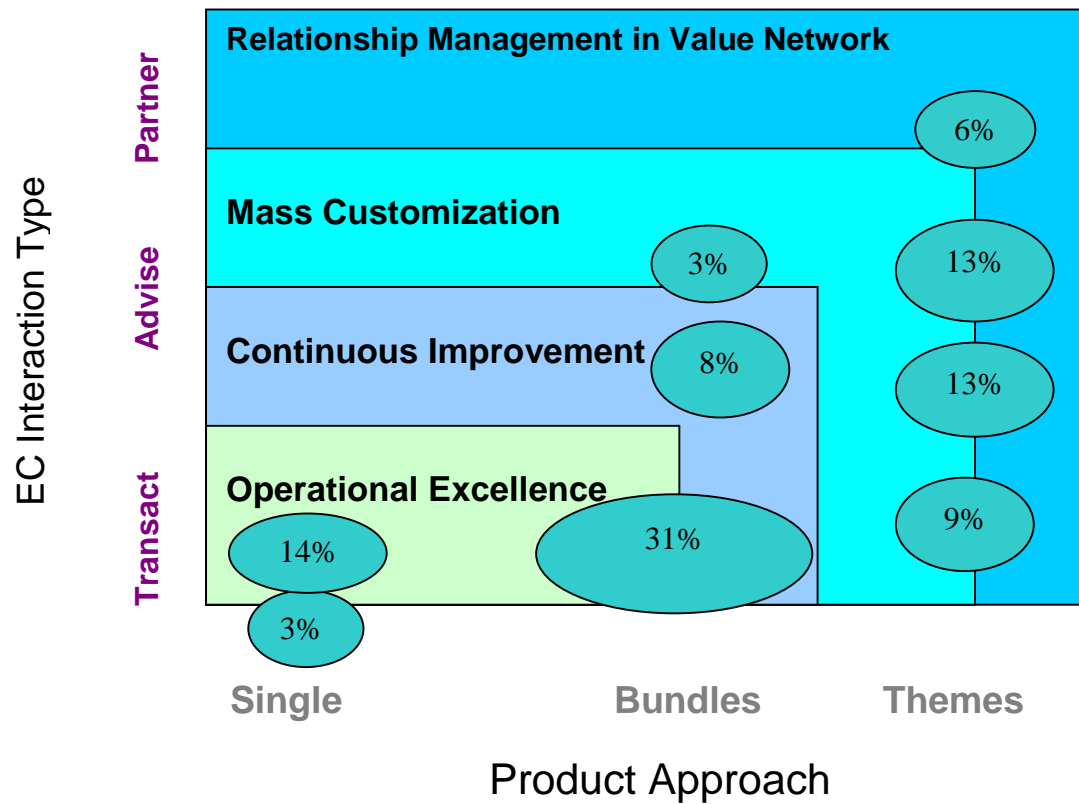
- single products or services (e.g., books, CD's., aloha shirts, or consultation);
- bundles (e.g., vacation packages that include airfare, hotel accommodation and tours); or
- themes (such as a Web site to help a potential customer organize a conference in Maui; or a Web site to help a customer schedule an out-of-state person to have surgery in Honolulu)

The most advanced form of e-business would be to put in place a fully integrated information system capable of interacting with the company's business partners (i.e., value chain integration). The Web-based system should be intelligent enough to fully assist their customers' needs (i.e., set up a line of products and service to satisfy a "theme").



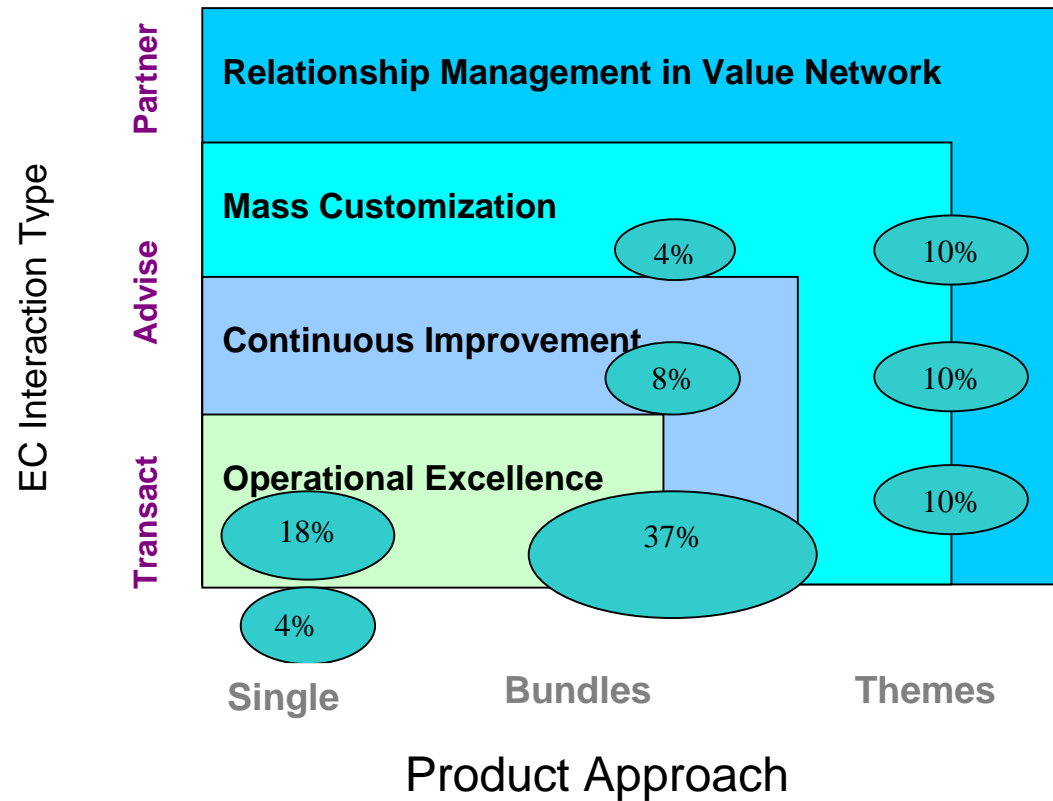
The framework shown in the figure above is used to gauge the competitiveness of the companies engaging in E-commerce. *Ceteris paribus*, an aggressive e-business should position itself in the top-right corner of the figure. In other words, the firm should be able to devise a product approach that satisfies its customers' "theme" needs (e.g., examples of a theme would be "organizing a conference for dentists in Honolulu", "set up an educational youth camp in Maui") and it should also possess state-of-the-art technology to fully integrate its information systems with those of its partners (e.g., linking hotel reservation system with the calendaring system of a convention center, the car rental reservation systems, travel agencies systems, etc.)

The figure below depicts the current abilities of 64 Hawai'i sites according to the framework outlined above. The majority of sites still utilize the strategy "Operational Excellence". It appears that Hawai'i businesses are relatively advanced in packaging their lines of products and services. Note a "3%" bubble at the left bottom of the graph. These companies have Web sites to sell their goods but all the transactions are done using other business means (e.g., fax order and phone confirmation).



Competitive Strategies (n=64)

Some of the sites have company headquarters located outside Hawai'i. The figure below examines the e-competitiveness of the sites with company headquarters in Hawai'i. The overall competitiveness appears to drop slightly. We contend that there is a correlation between a company's size and its level of competitive sophistication. Many large international companies are likely to have an office in Hawai'i. These companies tend to be located more in the upper right corner of the framework.



Competitive Strategies Hawaiian Sites Only (n=51)

The Computers and Media sectors have the highest percentage of Web sites indicating links to their business partners with 77 percent and 78 percent, respectively. Financial Services, and Food and Beverage both have percentages above the average (46 percent), with 48 percent and 63 percent, respectively.

E-marketing

Marketing professionals refer to the four “P’s” to define marketing actions. These are: product, price, place and promotion. A successful company is one that has the right product, sold at the right place, at a right price with a cost-effect promotion plan.

In a physical world, all the four “P’s” take place in the same “medium”. With the information superhighway as a new medium for selling products, researchers in e-marketing advocate four new “P’s” to support one-to-one, real-time customer relationships.

Privacy

Privacy will be an increasing concern. It is imperative for any e-business to ensure their customers’ privacy. However, potential customers would be willing to give up some of their privacy in exchange for some goods or services they receive online. Firm should be able to understand their clients’ attitude with regard to privacy in order to devise a marketing plan.

Push and Pull Strategy

Passive Pull Strategy: The company creates an information library and makes it available on its servers. On a need basis, customers can visit the sites and peruse the information. The pull strategy allows customers to get up-to-date information in attractive formats. It is an effective and economical way to advertise, especially to unidentified potential customers worldwide.

Active Push Strategy: Companies use push technology to set up their own channels to pointcast important information to either their customers and/or their supply chain partners (on extranets). They identify target customers and attempt to do direct marketing using e-mail and/or via other means.

Personalization

To help customers avoid spending hours searching the Web, e-businesses can gather, filter, and arrange information to send to individual customers automatically and periodically via Web technology and the Internet based on their individual needs. To achieve a high level of personalization, Web sites need to be able to pre-specify customers’ profiles, select appropriate content, and deliver information in a customized format.

Promptness

Immediate response and feedback to customers are the norm rather than the exception. Customers expect to get their goods and services anytime, anywhere, at any price, and in any form or content.

Survey findings

When asked about the most important criteria of a good e-commerce Web site, 40 percent of the interviewed people mentioned security. Twenty percent believe that it is most important to make sure that the company's Web site aligns with the company's strategy and business plan. Thirty percent claim that the customer should never have to click the mouse more than three times to get the information he/she desires.

Easy navigation and ease-of-use, as well as keeping the information search process simple, were major concerns for 40 percent of the people interviewed. Another important criteria, according to 30 percent of the interviewees, is the customer's ability to track order status and to make changes on orders up to the very last minute. Twenty percent also state that the Web page must be dynamic and up-to-date. Twenty percent of the interviewees said that they are no longer concerned about the uploading speed of a page. However 10 percent mentioned fast loading time as an important design criterion.

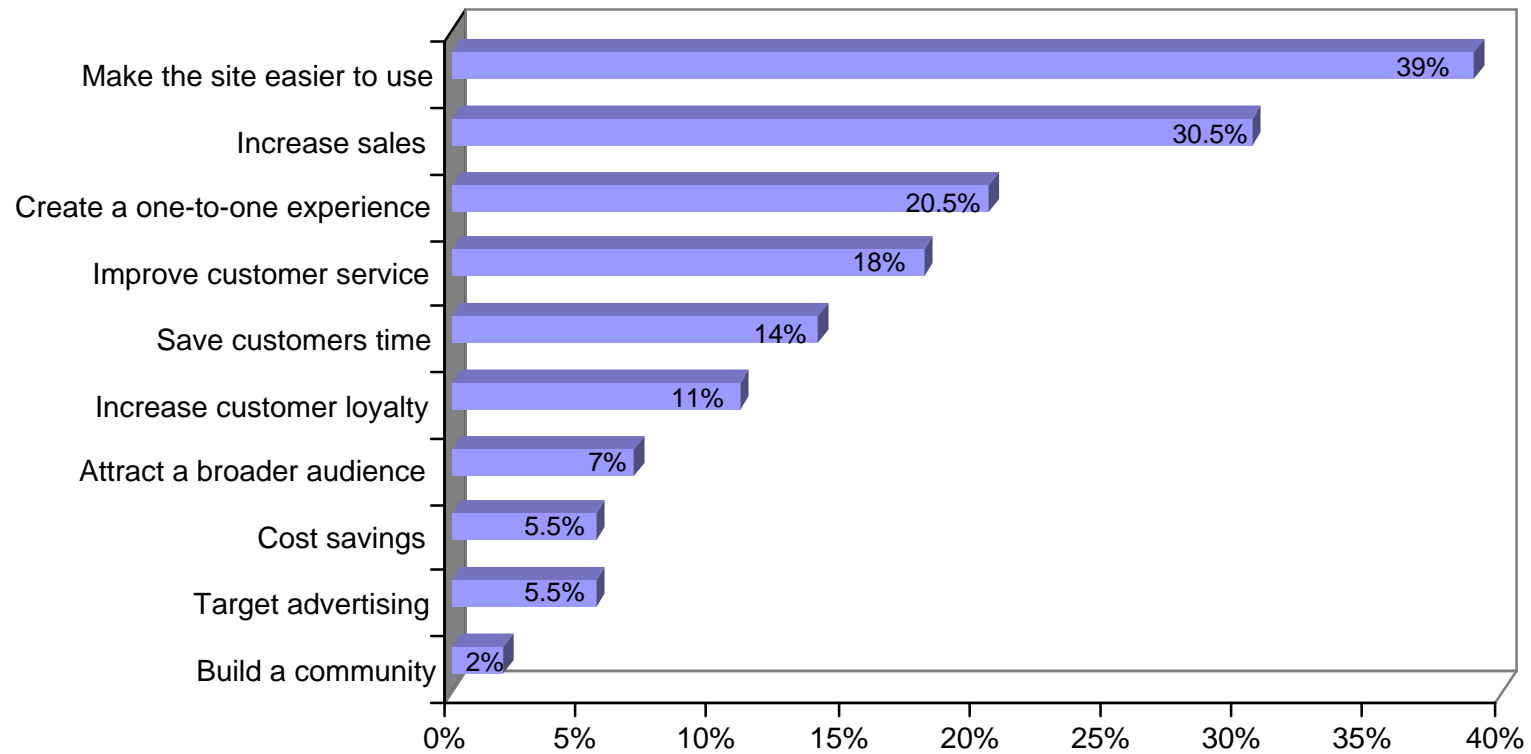
Some other criteria mentioned by the experts are listed below:

- Control of personal information entered by the customer and ensuring the privacy of personal information
- Accurate pricing and accurate inventory
- Online brand and the offline brand have to match
- Automatic e-mail notification
- Independence of the browser and the type of computer
- Ability to interface with the company on a human level (1-800 number)
- Easy return policy
- Lowest common denominator
- Liability

These points of view are generally consistent with the findings by Forrester Research, Inc. on "The Personalized Web."

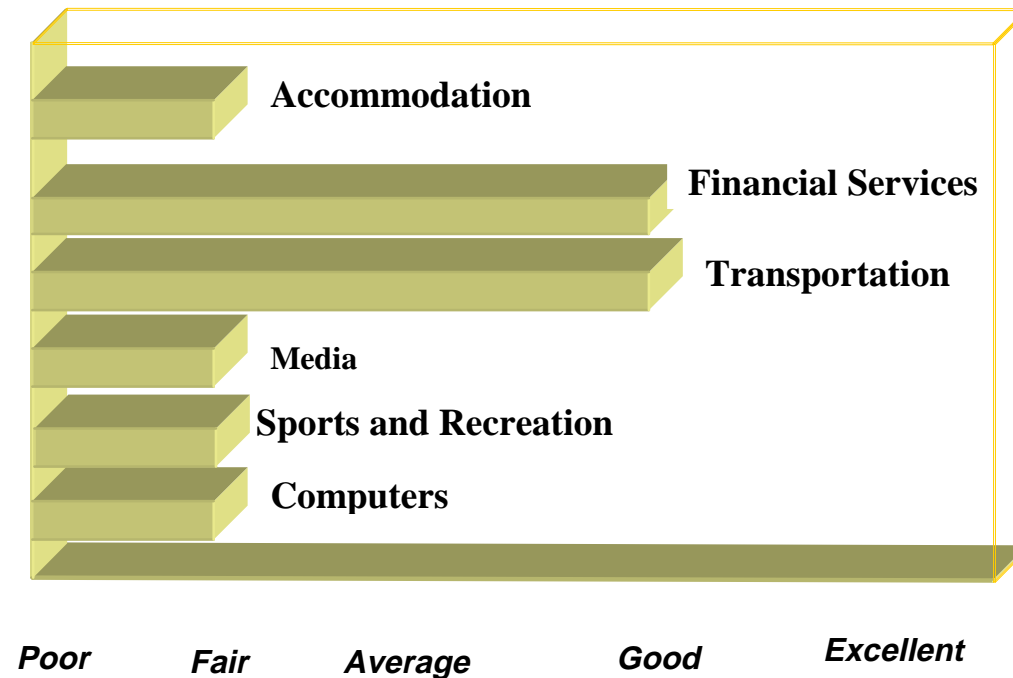
The Personalized Web

"What are you trying to accomplish with personalization?"



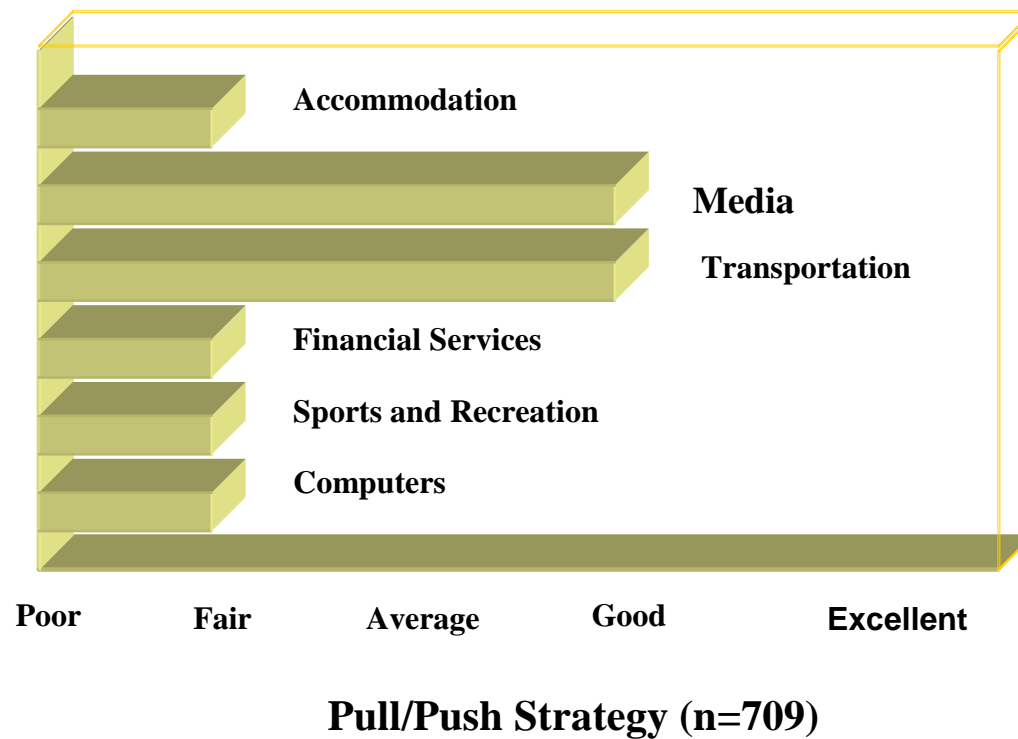
Source: Forrester Research Inc. survey of 44 businesses

Using these criteria, the Hawai'i Web sites were ranked according to a qualitative scale ranging from "Poor personalization" to "Excellent Personalization." It is expected that with experience and recent advances in e-business software, achieving "personalization" will be less labor- and cost-intensive.



Personalization Strategy (n=709)

Hawai'i sites fare relatively low in the "Pull/Push strategy" with the exception of the Media and the Transportation sectors. These two sectors are known nationwide as being aggressive in this marketing approach.



Some Recommendations for Starting a New E-business in Hawai'i

Finally, we asked experts their recommendation to Hawai'i companies who would like to open up an e-business. Here are some of their recommendations in unedited format:

“I recommend businesses not spend too much time on the planning process for an E-Commerce site but to do it and learn and grow it from there. The longer you wait, the further behind you become.”

“Any market analysis, any effort to think strategically about where are you going and why the Internet is significant to you is a step in the right direction.”

“You don't have to make big investments to start an E-Commerce Web site. You can be Web-friendly and Web-able without spending a lot of money.”

“... do the planning but don't spend six months on the planning before you start a Web site. Use the planning and immediately get a Web site so that you can get into the string. It is important to get your toes in the water. Because as soon as you and your company have a Web site, all these articles that you read in the magazines, every time you read this information you personalize it. Customers' needs become more sophisticated, they need more than a static page with flat HTML, they need a dynamic page with a database behind it. Probably less than five years ago, you wouldn't dream of making a Web site without having it fed from a database.”

“Small businesses often have a clear idea in mind that they want to do E-commerce but they don't have a clear idea of what's involved or how much it costs, or whether it is really useful for their business.”

“Part of moving into E-commerce is being as smart about marketing your presence online as you are offline. I think people have spent so much time on focusing on whether their Web site looks good and whether it has the right information on it that they really have forgotten or not spent enough time on the marketing of it. A lot of companies that go into having a Web site early are now saying: We really want to do this right, we want to actually do business online, we are ready to do the next stage. They realize that just having a Web site floating out there is not helping them very much, that they are really moving towards E-business, E-commerce and that brings all of the challenges that any business has plus the fact that it is all new territory.”