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Adel M. Aladwani

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Key Internet characteristics and e-commerce issues in Arab countries

Adel M. Aladwani

College of Administrative Sciences, Kuwait University, Edailiyah, Kuwait

Abstract *This study describes the state of the Internet in Arab countries. It reports certain Internet characteristics and e-commerce issues in the region and brings some of the critical challenges facing the diffusion of the Internet and its applications in Arab countries to the attention of policy makers in these nations. Overall, the review reveals that most Arab countries still have a long way to cover before being able to fully realize the benefits of the Internet.*

Introduction and background

It is no exaggeration to assert that we, as an information technology community of researchers and practitioners, know very little about the state of the Internet in the Arab world and more so in some parts of it. Probably some of us are partially informed about some aspects of the Internet in some Arab countries like Egypt, Saudi Arabia, and United Arab Emirates, but certainly almost all of us are unaware of how many other Arab countries like Mauritania and Djibouti are doing in this regard. This fact suggests bad news for those CEOs who are eager to exploit the Internet to enter into the Arabian market, which is equal in size to that of the USA and in purchasing power to that of China and many other middle income countries. The purpose of this paper is two-fold. First, it seeks to shed more light on Internet statistics in Arab countries (see Table I for basic statistics) including: Arab North-African countries (Algeria, Egypt, Libya, Morocco, Mauritania, and Tunisia), Arab East-African countries and Yemen (Comoro Islands, Djibouti, Somalia, Sudan, and Yemen), Arab heartland (Jordan, Lebanon, Palestine, Syria, and Iraq), and Arab Gulf countries (Kuwait, Saudi Arabia, United Arab Emirates, Bahrain, Qatar, and Oman). Second, it tries to suggest some guidelines to Arab decision makers as to how to build an environment conducive to Internet operations in their countries.

Arab countries are similar in many ways including religion, customs and values, history, and language. However, without indulging into a debate over the differences and similarities between Arab countries, we contend that the above-named four sub-regions of the Arab world differ mainly in terms of wealth and size. Wealth-wise, most Arab countries, with the exception of the Arab Gulf countries, do not have access to sufficient wealth and resources. For

example, while the average GDP per capita of Arab Gulf countries exceeds that of the world average and some advanced countries, the average GDP per capita of Arab East-African and Yemen countries equals that of least developed countries in the world; the per capita incomes in the other two Arab sub-regions fall somewhere in between and approximately equal the world's average. In terms of area size, the Arab region covers a vast geographic area spanning two continents, Asia and Africa. The Arab North-African sub-region covers a larger geographic area and is inhabited by more people than any other sub-region in the Arab world, while the Gulf sub-region (excluding Saudi Arabia) covers the smallest area and is inhabited by the least number of people. Wealth and size limitations impose some serious development challenges upon some Arab countries. For example, economies of Arab East-African countries and Yemen (with less money to spend and a larger area to develop) have a tendency to invest less in nation-wide projects requiring high government spending such as building an advanced telecommunication infrastructure.

The above brief discussion highlights some of the basic characteristics of Arab countries and provides us with important knowledge required to understand the state of the Internet in these developing societies.

Basic Internet statistics

The main sources of data used in this paper include UN *Human Development Report* (2001), Network Wizards (n.d.), and ITU (2001). Table II lists the basic Internet indicators in Arab countries as it appears at the beginning of the year 2001. Iraq, Palestine, and Somalia are excluded from our analysis owing to missing data. It shows that the six Arab Gulf countries dominate the top connectivity rankings in the region as reflected by the mainline and mobile phones per 1,000 measure. On average, about 30 percent of the inhabitants of these six countries subscribe to some sort of phone service compared to an average of only 9 percent of the inhabitants of the remaining countries. Arab East-African countries and Yemen, however, dominate the bottom of the same list of rankings with only 1.6 percent of the inhabitants of this sub-region having access to phone services.

The figures in Table II also show that the Arab Gulf sub-region again dominates the top PC ownership rankings in the whole Arab region. The relatively high penetration of PCs in Gulf countries may be because they are

Statistic	Value
Population	277,560,700[a]
GDP per capita (USD)	4,550
Life expectancy in years	66.4
Adult literacy rate (%)	61.3
Note: [a] Including Iraq, Somalia and Palestine (estimated)	

Table I.
Arab countries' basic statistics (1999)

	Estimated mainline and mobile phones per 1,000 people	Estimated number of personal computers per 1,000 people	Estimated number of Internet hosts per 1,000 people	Estimated number of Internet users per 1,000 people
Algeria	59.829	6.477	0.001	1.619
Bahrain	550.162	138.744	1.637	58.419
Comoro Islands	10.026	4.323	0.058	2.161
Djibouti	15.571	10.188	0.002	2.194
Egypt	107.814	22.056	0.035	7.089
Jordan	151.260	22.488	0.136	19.087
Kuwait	492.617	130.589	1.755	78.353
Lebanon	407.409	50.050	1.605	85.800
Libya	115.076	NA	0.005	1.784
Mauritania	9.850	9.434	0.045	1.887
Morocco	132.870	12.345	0.066	7.054
Oman	153.569	31.519	0.281	35.459
Qatar	469.621	150.387	0.052	50.129
Saudi Arabia	200.889	60.166	0.173	9.256
Sudan	13.178	3.216	0.024	0.965
Syria	105.334	15.443	0.001	1.853
Tunisia	110.000 (est.)	22.856	0.003	10.432
United Arab Emirates	939.467	153.494	13.177	282.046
Yemen	20.640	1.907	0.003	0.817

Table II.
Basic Internet
indicators in
Arab countries
(January 2001)

seen as luxury goods. On average, about 7.4 percent of the inhabitants of these
six countries own a PC compared to an average of 1.3 percent of the inhabitants
of the remaining countries. The Arab East-African sub-region, once again,
dominates the bottom of the same list of rankings with less than 0.3 percent of
the inhabitants of this sub-region owning a PC. In terms of the number of PCs,
Egypt comes first with 1,400,000 computers and the Comoro Islands come last
with approximately 3,000 computers.

Table II further shows that the Arab Gulf sub-region tops Internet use
rankings in the region. On average, about 4.1 percent of the inhabitants of these
six countries use the Internet compared to an average of 0.6 percent of the
people in the remaining countries. The Arab East-African sub-region
dominates the bottom of Internet use rankings with less than 0.1 percent of
the people of this sub-region using the Internet. In terms of the number of
Internet users, United Arab Emirates come first with 735,000 users and
Djibouti comes last with 1,400 users.

In terms of number of hosts per 1,000 people, Table II shows that the Arab
Gulf sub-region once more dominates the top rankings. On average, there are
approximately 1.5 hosts per 1,000 people in the six countries compared to an
average of 0.05 hosts per 1,000 people in the remaining Arab countries. Not

surprisingly, the Sudan, Djibouti, and Yemen sub-regions have the least number of hosts among all sub-regions of the Arab world with 0.02 hosts per 1,000 inhabitants. In terms of the absolute number of Internet hosts, United Arab Emirates comes first with more than 34,000 hosts and Djibouti comes last with only one Internet host.

After delineating the basic Internet indicators in Arab countries, it would be a worthy attempt to put these figures into perspective and to discuss how Arab sub-regions perform along basic Internet indicators compared to some other countries and regions of the world. Table III provides a summary of this comparison.

Table III shows that, on average, Arab countries are in a better shape along all basic Internet indicators than least developed countries of the world. Nonetheless, on average, Arab countries are performing worse than the world's average in terms of the existence of a connectivity via phones, number of hosts, and number of Internet users, but they are doing better than the world's average in terms of the number of PCs. The worst performance for Arab countries along the examined Internet metrics is evident in the number of hosts per 1,000 people, approximately 30 percent of the Arab countries score less than the average of least developed countries. The score of United Arab Emirates of 13.2 hosts per 1,000 inhabitants is the closest to the world's average. On a sub-region level, the Arab Gulf is the only sub-region outperforming the world's average in two indicators, phones per 1,000 and computers per 1,000. Moreover, if we take off Saudi Arabia's Internet usage data, the average of the Gulf sub-region in Internet usage will also outperform the world's average.

It is obvious from Table III that Arab countries need to make many improvements in their basic Internet capabilities before reaching at least the current level of Internet performance in advanced countries such as the USA,

	Estimated mainline and mobile phones per 1,000 people	Estimated personal computers per 1,000 people	Estimated internet hosts per 1,000 people	Estimated internet users per 1,000 people
Arab countries:	112.698	20.711	0.222	10.353
East-Africa and Yemen region	15.861	2.846	0.016	0.914
Gulf region	293.149	73.960	1.446	41.571
Heartland region	157.032	21.817	0.248	17.352
North-Africa region	100.918	15.611	0.031	5.799
Least developed countries	7.796	1.975	0.025	1.131
World	280.414	0.773	17.518	59.941
Japan	1,111.953	315.162	36.566	370.945
United Kingdom	1,315.614	337.817	28.075	257.672
USA	1,097.651	585.178	292.832	346.578

Table III.
Basic Internet indicators – Arab sub-regions and the world (January 2001)

UK, and Japan. The performance gap between these three countries and the Arab region is unlikely to close in the near future. One Arab Gulf country, United Arab Emirates, is doing exceptionally well in this regard, however. With phones available to almost every person in the country, and an estimated number of Internet users per 1,000 people that exceeds the same metric in the UK, United Arab Emirates is the only Arab country that has the potential to be among the leaders of the world in Internet preparedness. Experts from the Arab region should be aware of the latest technological initiatives that have taken place in the United Arab Emirates, and especially Dubai, the playground of the first Arab Internet city and e-government. This is partly due to:

- leadership with a clear modernization vision;
- sufficient financial resources; and
- an attractive place to work in for highly skilled expatriates from South Asia, Western Europe, and the USA.

Internet business applications in Arab countries

It is not possible to discuss the state of the Internet in Arab countries without considering the state of its applications, and most notably electronic commerce (e-commerce). Thus, in this section, we will shed light on certain of the basic dimensions of e-commerce in the region including:

- Internet service providers;
- Internet access prices;
- the market size of e-commerce,
- perceived e-commerce benefits,
- perceived e-commerce issues; and
- consumers' attitudes towards e-commerce in Arab countries.

There are more than 100 Internet service providers in operation in Arab countries providing several services such as dial-up (the most common mode of connection), ISDN, leased, ADSL, Web hosting, and e-mail services, and representing approximately 0.02 percent of the number of Internet providers in the USA. Egypt has the largest number of Internet service providers, while a notable number of Arab countries have only one Internet service provider in operation. The monopoly in the Internet market raises the cost of an Internet connection in most Arab countries and to some extent helps in the deterioration of the service. In most cases, Arab governments, and for political reasons, try to create a monopoly in the ISP market by preventing new firms from entering the market (e.g. through controlling licences). Another reason why Internet costs are high and connection speeds are low in Arab countries is because Internet service providers are not allowed to provide their own international gateways. Table IV lists the number of Internet service providers in Arab countries.

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Country	Number	Example Internet service provider
Egypt	38	Link Egypt (www.link.com.eg)
Saudi Arabia	25	Naseej (www.naseej.com.sa)
Lebanon	16	Cyberia (www.cyberia.net.lb)
Algeria	11	Cerist (www.cerist.dz)
Morocco	11	Maghrebnet (www.maghrebnet.net.ma)
Jordan	10	Firstnet (www.firstnet.com.jo)
Tunisia	5	Global Net (www.gnet.tn)
Bahrain	3	Batelco (www.batelco.com.bh)
Kuwait	2	QualityNet (www.qualitynet.net)
Syria	2	Syrian Telecom. Est. (www.syriatel.net)
Djibouti	1	STID (www.intnet.dj)
Libya	1	LibyaNet (www.libyanet.net)
Oman	1	GTO (www.gto.net.om)
Qatar	1	Q-Tel (www.qatar.net.qa)
Sudan	1	Sudanet (www.sudanet.net)
United Arab Emirates	1	Emirates Internet (www.emirates.net.ae)
Yemen	1	Y.net (www.y.net.ye)

Source: ISPs in the Arab world (n.d.); ISPs services and prices (2001)

Table IV.
Number of Internet service providers in Arab countries

Figure 1 summarizes Internet access prices in Arab countries. It shows that in all but two countries the cost of a month's Internet access exceeds that of the USA (AOL to be specific). Only individuals living in Kuwait and United Arab Emirates can have access to the Internet for less than US$20 per month. In most Arab countries, the total cost of Internet access is way beyond the purchasing power of average citizens, especially when adding the high cost of making local calls to the cost of an ISP connection. For example, in Saudi Arabia, local calls cost three times as much as the cost of an ISP connection. The good news, however, is that Internet access prices in Arab countries are decreasing. In Kuwait, for example, ISP connection costs five years ago were seven times higher than current Internet access prices (local calls are free in Kuwait).
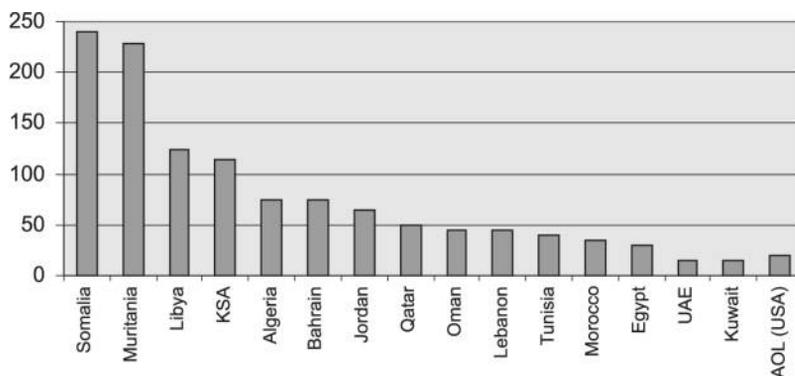
Figure 1.
Internet access prices US$ for 30h/month – ISP and local calls costs

Note: US$ for 30h/month – ISP + Local Calls Costs

Growth trend of e-commerce worldwide is remarkable. The monetary value of e-commerce is predicted to approximate US $7 trillion in the next few years (Sanders and Temkin, 2000). Similarly, potentialities of e-commerce in Arab countries are noteworthy. Internet shoppers in Arab countries have spent an estimated US$95 million on goods and services purchased on the Internet in 1998, a staggering market growth of 900 percent since 1997 (Jarrah, 1999). Our own estimates suggest that Arab consumers are expected to spend more than US$1 billion on products and services purchased over the Internet and that B2B monetary transactions are expected to reach more than US$3 billion in 2005. Half of the spending on e-commerce is expected to come from individuals and organizations operating in Arab Gulf countries.

The overall evidence suggests that Arab businesses realize the potential of the Internet and agree that it is a worthwhile strategy to take advantage of the Internet's many benefits and its booming applications. Table V summarizes the rankings of e-commerce benefits in Arab countries from the perspective of top management.

From Table V, one can see that providing faster and easier service to customers came top as the most important benefit of e-commerce in Arab countries. Providing more reliable service to customers also was ranked high among the benefits. Among the top benefits also came creating new markets, improving the competitive position of the bank, and to a lesser extent enhancing bank's image of the bank. These benefits reflect market motivators. Arab businesses are probably aware of the impact of financial globalization on their market positions and are therefore taking precautions by placing greater emphasis on product features and service excellence, using e-commerce as a source of competitive advantage. Finally, participating managers ranked reducing administrative costs and cutting the number of workers as the least important benefits of e-commerce. Overall, these benefits are in some way comparable to those benefits reported for other parts of the world, see for example, Auger and Gallaugher (1997).

E-commerce benefit	Rank
Providing a faster service to customers	1
Providing an easier service to customers	2
Providing a more reliable service to customers	3
Creating new markets	4
Improving the competitive position	5
Reducing operational costs	6
Improving the image	7
Reducing administrative costs	8
Meeting customers' demand for the service	9
Reducing the workforce	10
Source: Aladwani (2001)	

Table V.
Management's rankings of e-commerce benefits in Arab businesses

Arab businesses also realize that there are certain strings attached to the adoption of the Internet. Table VI and Table VII summarize e-commerce issues in Arab countries from the perspectives of business managers (IT and general management) as well as potential e-commerce adopters.

If Table VI is divided into three groups, one can see that technical and customers' issues, e.g. Internet security, speed of service, and customers trust and awareness, dominate the top tier, indicating their importance. Business managers perceive Internet security as a very important future e-commerce barrier. Almost equally important to technical issues are customers' issues,

Issue	Rank
Internet security	1
Customers' trust	2
Speed of the service	3
Information privacy	4
Consumers' awareness	5
Continuity of the service	6
Spread of computer use	7
Spread of Internet use	8
Difficulty of using the service	9
Pricing of the Internet service	10
Internet infrastructure in the country	11
Cost of maintaining the site	12
Lack of legal regulations	13
ISP monopoly	14
Difficulty of maintaining the site	15
Source: Aladwani (2001)	

Table VI.
Business managers'
perception of
e-commerce issues
in Arab countries

Issue	Rank
Internet security	1
Legal regulations	2
Information privacy	3
Business reputation	4
Reliability of the service	5
Business trustworthiness	6
Speed of the service	7
Easiness of the service	8
Diversity of the service	9
Literacy in Internet usage	10
Continuity of the service	11
Cost of the service	12
Literacy in computer usage	13
Arabized Web content	14
Source: Aladwani (2001)	

Table VII.
Consumers'
perception of
e-commerce issues
in Arab countries

which dominated the second tier of Table VI. Business managers rated customers' awareness, knowledge of how to use the service, and spread of Internet and computer use as highly important. Regulatory issues dominated the last tier of our table. Unfortunately, the organizations studied did not see the importance of such issues. Lack of legal regulations, ISP monopoly, Internet infrastructure, and pricing of Internet services were perceived by business managers as the least important e-commerce issues.

Table VII summarizes potential customers' rating of e-commerce issues. From the table it is clear that consumers agree with business managers on the importance of such issues as Internet security, consumers' privacy, trust, and service quality. The most noteworthy disagreement between the managers (Table VI) and consumers (Table VII) is over the importance of legal regulations supporting e-commerce, service reliability, and the consumers' knowledge of computers and the Internet. The consumers believe that the issue of laws supporting e-commerce is critically important. However, business officials believe that the issue of legal regulations is not as important as other issues. This finding indicates that a necessary condition for promoting the use of e-commerce is to have Internet-related legal regulations. Moreover, business officials believe that providing faster and easier service is more important than providing a reliable service (Table VI). Consumers, however, believe the opposite. They prefer a more reliable service to a faster and easier one. This result shows once again that trust-related issues are important determinants of e-commerce diffusion in Arab countries. It is also interesting to note that "Arabized Web content" is ranked last. This finding may be due to the nature of the participants in our sample, which consists of university students, who usually have adequate knowledge of the English language.

Finally, it is evident from the issues highlighted that consumers' attitudes towards e-commerce could play an important role in determining its diffusion. But, unfortunately, no systematic attention has been paid so far to exploring the nature of Arab consumers' perceptions and feelings towards e-commerce. A notable exception, however, is a recent study by Aladwani (2002) that provides the following characterization of Arab consumers' attitudes towards e-commerce:

- Approximately 80 percent of the surveyed Arab consumers have favorable intentions to e-shop sometime in the near future.
- Approximately 67 percent of the same pool of consumers view e-shopping as an easy way to use/carry out tasks, and approximately 65 percent of them are fully satisfied with the idea of using the Internet to purchase products and services.

Concluding thoughts

The aim of this study was to shed light on the state of the Internet in Arab countries. The present paper has shown that the Internet performance gap

between advanced countries such as the USA and the Arab region is far too large to close in the near future. Furthermore, the study has shown that the Internet service providers market in most Arab countries suffers from monopoly, a major obstacle of Internet take-off in this part of the world. The study also has shown that principal benefits of e-commerce in Arab countries include customer-oriented and market-oriented elements. Primary issues foreseen by Arab business managers include technical obstacles and the attitudes and behaviors of e-commerce consumers. Internet shoppers mentioned security, legal regulations, consumers' privacy, and business's reputation as the most important e-commerce issues in the Arab region.

Given the current state of the Internet in the region, Arab decision makers must be persuaded by Arab Internet researchers of the macro benefits of the Internet for Arab countries. Thus, a major issue that needs to be addressed in this "concluding thoughts" section is to convince Arab decision-makers that it is important to take the necessary practical steps for their countries to realize the benefits of the Internet. On this specific point, one can confidently say that the Internet can offer several benefits for Arab economies and societies. Figure 2 shows that there is a positive relationship between human development and the state of the Internet in a given country. Economically speaking, no one can overlook the significant relationship between the Internet and the level of development in production systems of organizations, and consequently, improvements in the economic efficiency of countries. The constant decrease in the price of Internet technology gives many Arab organizations the chance to renovate their old production systems. These new systems can, in turn, lead to increases in production efficiency, allowing Arab organizations to maintain low production costs. Moreover, Internet technology can cause not only production costs, but also operations costs to go down through improving, for example, the efficiency and effectiveness of maintaining inventory and controlling the cost
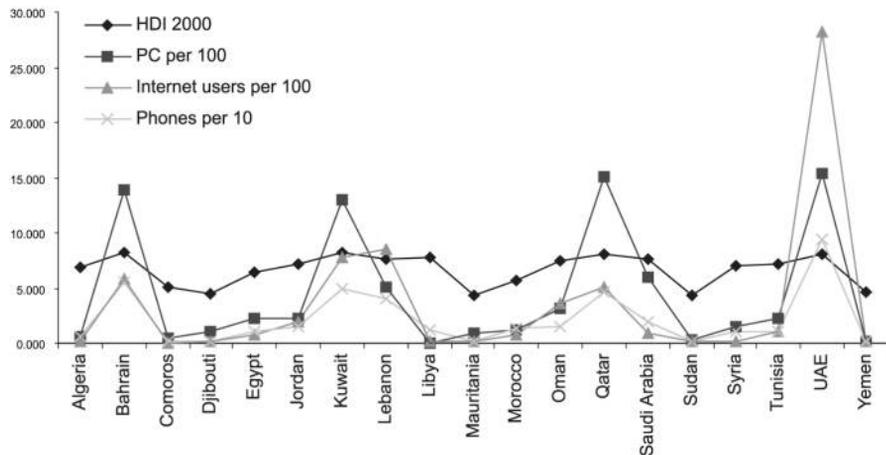
Figure 2.
Human vs Internet development in Arab countries

of conducting commercial transactions. The improvements in production systems and the expected effects on the structure of costs of Arab organizations can lead to decreases in the prices of goods and services sold to their customers.

The Internet can also have important effects on the form and intensity of competition within Arab markets. In the traditional economy, size of the organization plays a role in determining its dominance in the market. In the Internet economy, however, every player starts at the same level. Small as well as large Arab organizations can have a role in the market and can compete effectively against each other to gain their share from the market. This is simply true because the competitive posture of an organization within the Internet market depends on the breadth as well as depth of the knowledge inventory of the organization more than physical size. Higher competition means among other things that initiative and control is moving from the hands of the seller to the hands of the buyer. Therefore, all indicators strongly point to one conclusion: if adequately managed, the Internet can lead to more open and more efficient Arab economies.

Socially, the widespread diffusion of the Internet can bring with it significant social changes to receiving societies, thus, attention is required from Arab decision makers to secure appropriate implementation plans to take full advantage of the potentialities of the Internet. The Internet has the ability to transform these societies in many different ways. It can be exploited to improve the level of human well being and quality of life, especially in less developed Arab countries. It can be used to transfer knowledge and information technology from developed countries such as the USA and the UK to help eliminate poverty in some parts of the region and create jobs for Arab citizens with suitable Internet skills.

Because it is evident that the Internet is projected to have significant impacts on various elements of Arab societies, policy makers, global managers, and researchers interested in this region of the world will value the implications of the present investigation. Some of the critical barriers facing the Internet in Arab countries warrant special consideration from decision makers in the region, these include:

· Developing the basic Internet infrastructure through increasing the quantity and quality of digital mainline and mobile telephones and Internet hosts, and expanding the link between local and international telecommunication networks.

· Implementing appropriate economic measures that increase the level of competition in the Internet service providers market and permit Internet companies to provide their own international gateways.

· Preparing a legal environment dealing with the Internet, including issuing appropriate e-commerce laws such as the digital signature, the digital identity, tax treatment, consumer protection, etc.

- Formulating and implementing integrated educational and training plans that aim to prepare a qualified technical workforce capable of developing and managing Internet applications up to world standards.
- Finding and implementing appropriate public awareness programs that build upon the favorable sentiments towards the Internet among Arabs and shed light on the importance and benefits of the Internet and its applications for the economic future of the Arab region, inducing actual use of e-commerce.

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