



## **A review on measuring digital trade & e-commerce as new economic statistics products**

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**ABSTRACT**

The Internet and digitalization are fundamentally changing the way people, businesses and governments interact. This has led to a new phase of globalization underpinned by the movement of data across national borders, changing the nature, patterns and actors in international trade in goods and services.

However, despite the growing importance of what is commonly referred to as digital trade, little empirical and internationally comparable information currently exists, inhibiting a full understanding of the scale and policy challenges of digital Trade, which has in turn raised concerns about the capacity of current statistics to fully capture and separate identify this phenomenon. In the other word, in digital trade economy there is a remarkable gaps and many of its statistics are not enough to fulfil the demands. It has been growing in importance, and with it, demands for detailed statistics from a number of policy areas including market access, trade facilitation, opportunities for SME<sup>1</sup>s, regulation, competition, digital data flows and privacy has remained yet.

Providing an overall review and making practical examples in case of Iran, this study tries to open other insight toward digital trade statistics as a new product of economic statistics. Beside, in this study some of the challenges like informal or semi-informal sectors toward digital trade will be addressed and an analysis on Organization for Economic Co-operation and Development (OECD) conceptual framework and an inventory of current measurement practices on digital trade will be presented. Finally, a case study on economic account new digital trade activity and startup based on the internet platform in Iran will be illustrated to describe the exponential growth rate of these kind of e-commerce in Iran. Producing reliable and accurate official statistics in this case is highly desirable. On the whole, obtained result show that e-commerce has been placed in top up-warding sector of economic growth in recent years in Iran.

**Keywords:** The Internet, Digitalization, Globalization, E-commerce, Digital Trade, Informal or semi-informal economy

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<sup>1</sup> Small and Medium-sized Enterprises (SMEs)

## **I. Introduction:**

The Internet and digitalization are fundamentally changing the way in which people, businesses and Governments interact. This has led to a new phase of globalization underpinned by the movement of data across national borders, changing the nature and patterns of and the actors in the international trade in goods and services. While digitally related transactions in either goods or services have existed for many years, the current scale of transactions and the emergence of new and disruptive players (online platforms) are transforming production processes and industries, including many that were previously little affected by globalization [1].

However, despite the growing importance of what is commonly referred to as digital trade, little empirical and internationally comparable information currently exists. This has inhibited a full understanding of the scale and policy challenges of digital trade, which in turn has raised concerns about the capacity of current statistics to fully capture and identify this phenomenon [1]. Moreover, the growing importance of enterprises with new business models as online platforms in Iran such as Digikala, Snapp, Tab30 etc. and other social networks like Telegram, Instagram, Facebook etc. gives rise to a number of additional complications, including in relation to the nature of their activities, for services trade and e-commerce policy. Besides, a number of efforts have been made by both governments and other stakeholders to develop definitions and classifications covering ICT-enabled services [11].

In the side of official Statistics, an important impediment to the availability of data on digital trade — and certainly of statistics that are coherent with the current accounting frameworks (the 2008 System of National Accounts (2008 SNA) and the Balance of Payments and International Investment Position Manual, sixth edition (BPM6) and are comparable across countries, is the lack of a common understanding of digital trade and of a comprehensive conceptual measurement framework. Therefore, as part of the collective efforts to address the broader measurement challenges, OECD<sup>2</sup> has developed a draft conceptual and measurement framework for digital trade, which provides a proposed typology of all digital trade flows that are considered “digital” [1].

Following to introduction, section ii presents an overview of the conceptual measurement framework for digital trade based on OECD model and then an overview of the Iran’s digital economy and existing data is provided in section iii. With considering conceptual framework, an analysis will be provided in the case of Iran in section iv. Finally, results can be presented.

## **II. Conceptual framework for measuring digital trade**

The focus on digital trade, brings to the fore new dimensions related to important characteristics of digitization, namely: the ordering and delivery processes (both of which can be digital), the nature of products (which products should be considered digital?) and the new actors involved, including not only digital intermediaries, but also households, given the increasing role played by consumers as unincorporated enterprises through the “sharing economy” [1].

The conceptual framework (see the figure below) identifies those three key characteristics, or dimensions, as the nature of the transaction (“how”), the product (“what”) and the partners involved (“who”). Central to the framework is the nature of the transaction, which builds on the common understanding that digital trade should encompass all digital trade transactions that are either digitally ordered, digitally facilitated (referred to as “platform-enabled”) or digitally delivered (note that these are not necessarily mutually exclusive categories) [2]:

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<sup>2</sup> Organization for Economic Co-operation and Development (OECD)

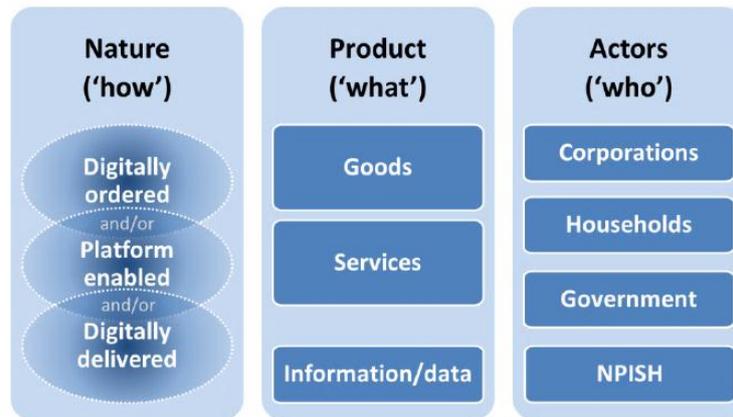


Fig1. Dimensions of Digital Trade<sup>3</sup>

Table1. Different dimension of digital nature in conceptual model

	<b>Digitally ordered transactions (E-commerce)</b>	<b>Digitally facilitated transactions (Digital trade flows)</b>	<b>Digitally delivered transactions</b>
<b>Definition</b>	Sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders	Cross-border trade flows facilitated by online platforms such as Facebook, Master Card, Visa etc.	Services and data flows that are delivered digitally as downloadable products
<b>Challenge in Iran</b>	Due to foreign currency exchange rate, online prices fluctuate and its getting hard to provide official statistics down by product and their average prices.	-Uncertainties about whether underlying transactions are recorded as cross-border trade or as income flows.  -Cross-border transactions should be recorded as “gross” (including the value of underlying services provided between residents) or as “net” (i.e., including only the value of the intermediation fee as cross-border)	-Nonobserve economy is significantly bigger than observant economy  - transactions’ data do not have a monetary flow

As a magnificent challenge, there is no classifications of goods and services that aim to identify ‘digital’ products (e.g. ICT goods and services, ICT enabled services, trade in ideas etc.) that hopefully will be proposed in near future by OECD. It is widely acknowledged that measuring trade in services is more difficult than measuring trade in goods. Services are intangible, hard to define and unlike goods they leave little or no administrative trail when crossing the border. As a result, data on trade in services lack the product and geographical detail available for trade in goods, a problem that creates significant and well-known knowledge gaps [11]<sup>4</sup>.

The second dimension identified in the framework ties into the first by identifying whether the products being traded relate to goods or to services, and also introduces a separate category referred to as information, or data [1,3]. The last dimension concerns the actors involved. It’s worth mentioning that the nature of transaction in digital process may be digital, the product either be digital (e.g. music files, article, etc.) or it

<sup>3</sup> NPISH, Non-Profit Institutions Serving Households.

<sup>4</sup> See examples in [12].

may not be (e.g. clothes ordered online). A comprehensive overview on the conceptual framework in the case of Iran will be provided in next parts.

### **III. Description of digital trade and e-commerce in Iran**

ICT and digital trade provide potential opportunities for economic growth not only in developed countries as an origins of ICT developers but in developing countries as comparable as Iran by facilitating online purchasing/sale. Iran with approximately 80 million populations, is one of the biggest developing countries in the middle east which has been mounting both fix and mobile the broadband internet connection. Significant infrastructure investment has developed widespread nationwide coverage of mobile networks and a national fiber-optic backbone. There is a high level of basic mobile access and mobile broadband has been growing rapidly since its recent deployment. Due to the fast and rapid improvement in ICT technology, the fix and mobile broad band internet connections has changed the way of communication and business in Iran. The internet penetration rate has risen dramatically during recent years and reach from 22.73% on 2012 to 61.03 on 2017 and it is estimated that it drives to 69% at the end of 2018. Rapid increase in the internet penetration rate, which obtain from proportion of internet users on population with six and more, shows the significant growth in the number of internet users and as a result considerable growth in the number of monetary transactions. As a supplementary index, the ICT development index(IDI), also was calculated on three criteria include access, skill and use of the internet, similarly confirm the growth of internet users in Iran the IDI index went up from 4.97 on 2015 to 5.85 On 2017.

Regarding to the ICT users, there are different types of enterprises which indirectly affect the digital market and e-commerce activities. These enterprises produce and serve ICT goods and services and composite the ICT share in Iran's GDP and play enabler roles for the other sectors as well. Based on 2017 survey, the distribution of ICT enterprises in Iran describe in table3. In these classification, some sectors wholly are digital like Electronic disseminations and others have indirect correlation and provide infrastructures for digital trade. In Electronic disseminations part, both state own and private organizations were placed for example IRANDOC<sup>5</sup> is a governmental organization which sales thesis, papers, articles, magazines online. It registers all identifications data of their customers and use special gateway for online transitions. All goods and services are available just online.

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<sup>5</sup> [www.Irandoc.ac.ir](http://www.Irandoc.ac.ir)

Table3. Different types of ICT enterprises in Iran based on 2017 surveys [13]

Type	Number	Value added (Rial)	Activity / service type
CT services providers	5834	$\sim 34 \times 10^{12}$	Cafe net, ISP <sup>6</sup> , ISDP <sup>7</sup> , FCP <sup>8</sup> , FWA <sup>9</sup> , Serveco <sup>1</sup> , SAP <sup>1</sup> , MVNO <sup>1</sup> , mobile roaming <sup>1</sup>
IT services providers	1949	$\sim 7 \times 10^{12}$	Software programming, computer consultancy, data ware house, web hosting, computer services
Post and communications	14393	$\sim 8 \times 10^{12}$	Mobile, Fixed telephone, Post, Delivery
Computer and telecommunications equipment installation and repair	4561	$\sim 11 \times 10^{12}$	Mainframe computer, telecommunications equipment, personal computers
produce ICT equipment	257	$\sim 16 \times 10^{12}$	Electronic equipment and devices, computers, telecommunication equipment, magnetic media, fiber optic cable, telecommunication cable, USP
Wholesale ICT goods	1145	$\sim 1 \times 10^{12}$	Computers, telecommunication equipment
<b>Electronic disseminations</b>	<b>410</b>	<b><math>\sim 2 \times 10^{12}</math></b>	<b>Online files, books, magazine etc.</b>
<b>Sum</b>	<b>28549</b>	<b><math>\sim 79 \times 10^{12}</math></b>	<b>ICT's goods and services</b>

In recent years, the dramatic growth of internet users and as a result online businesses and digital trade has drawn the national attention to this prominent sector in Iran as far as Iran placed in top 10 developing economies in UNCTAD<sup>1</sup> E-commerce Index, 2017.<sup>3</sup> Any indicator that is a proxy for online payment affects the index for economies where there is a high incidence of cash used to pay for e-commerce purchases (cash on delivery accounted for 7 per cent of global payments in 2015). In the Impact of new payment indicator, Iran with score +19 was placed in rank two after Mongolia with +24 endorsing the progress of new payment methods in Iran as shown below [5] while the proportion of ICT sector from Iran's GDP<sup>1</sup> on 2016 was approximately close to 10% (there a gigantic non-observe economy in this part).

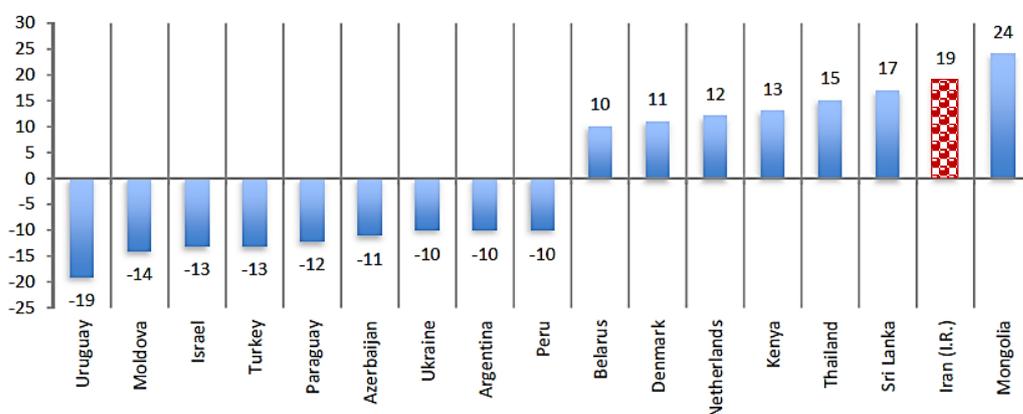


Fig 2. Impact of new payment indicator by UNCTAD

<sup>6</sup> Internet Service Provider (ISP)

<sup>7</sup> Internet Service Distribution Provider (ISDP)

<sup>8</sup> Fixed Communication Provider (FCP)

<sup>9</sup> Fixed Wireless Access (FWA)

<sup>1</sup> Service communication (Serveco)

<sup>1</sup> Satellite Access Provider (SAP)

<sup>1</sup> Mobile Virtual Network Operator (MVNO)

<sup>1</sup> United Nation Conference on Trade and Development (UNCTAD)

<sup>1</sup> Gross Domestic Product (GDP)

Table 2. UNCTAD B2C E-commerce Index for Iran's data, 2016 [5]

2016 Rank	Share of individuals using Internet (2014 or latest)	Share of individuals with credit card (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2014)	UPU postal reliability score (2013-14)	UNCTAD B2C e-commerce Index value 2015	2014 Rank
<b>77</b>	39	11	38	82	42.6	<b>69</b>

Table 3. Iran Placed in top 10 developing economies in the UNCTAD B2C E-commerce Index, 2017

2017 Rank	Share of individuals using Internet (2016)	Share of Individuals with an account (15+, 2014 or latest)	Secure Internet servers per 1 million people (normalized, 2016)	UPU postal reliability score (2016)	Index Value (2016 data)	Index Value (2015 data)	Index Rank (2015, data)
<b>48</b>	53	92	45	86	<b>69</b>	65	52

For more details, all legitimate websites whether are created or managed by individuals or enterprises have been tagged with E-NAMAD sign in their websites which shows its legal permission. Besides, all of the both governmental and private banks in Iran receive their activity permission and authorizations from Iran Central Bank (ICB). These Banks have their identifiable gateways for online payments which is recognized as unique getaway. All banking transactions' true copy will send to central database (SHAPARAK Co. on the behalf of ICB directly. Up to now, there are 12 legalized Banking payment service provider (PSP) for online payments under the support of different banking system. Clearly, SHAPRAK is responsible for saving, managing and maintaining a true copy of the all monetary transactions in the both banking system and all online transactions under the supervision of ICB whether they have done in website, mobile applications and points of sale (POS) devices.

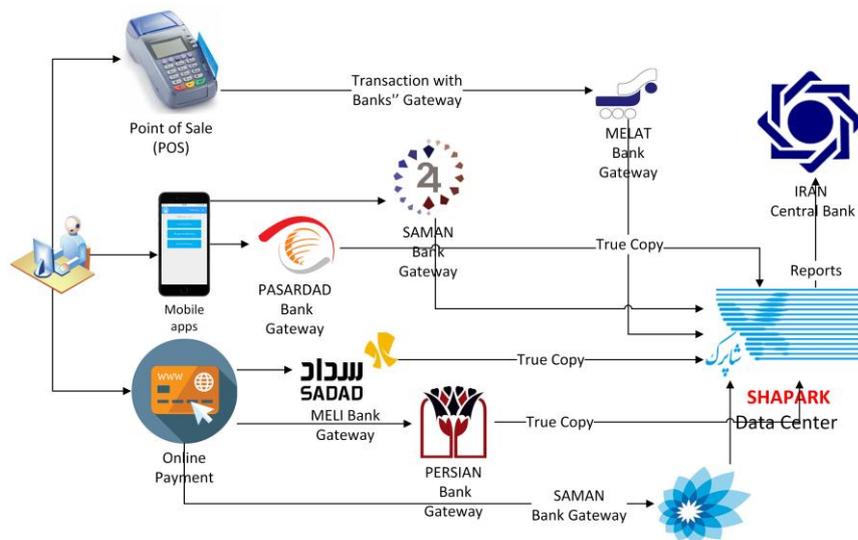


Fig9. Process description of different payment methods in Iran

In 2017 B2C E-commerce target there are 4 indicators: Internet users (ITU<sup>1</sup>), Secure servers (World Bank), Account penetration (World Bank Global FINDEX Database) and Postal reliability score (UPU<sup>1</sup>). In order to measure the digital trade and e-commerce in Iran, a survey for enterprises conducted on 2012 which include sample size 3834 from 5854 enterprises and it covered four ISIC code 7910, 5811, 6612 and 5510 (ISIC<sup>1</sup> Rev.3). This survey focused on measuring digital trade in mentioned codes though it was not fully covered the whole enterprises. Regarding to obtained results, 60% of enterprises had internet based purchase and sale (equal to 3,048) [6].

<sup>1</sup> International Telecommunication Union (ITU)

<sup>1</sup> Universal Postal Union (UPU)

<sup>1</sup> International Standard for Industrial Classification (ISIC)

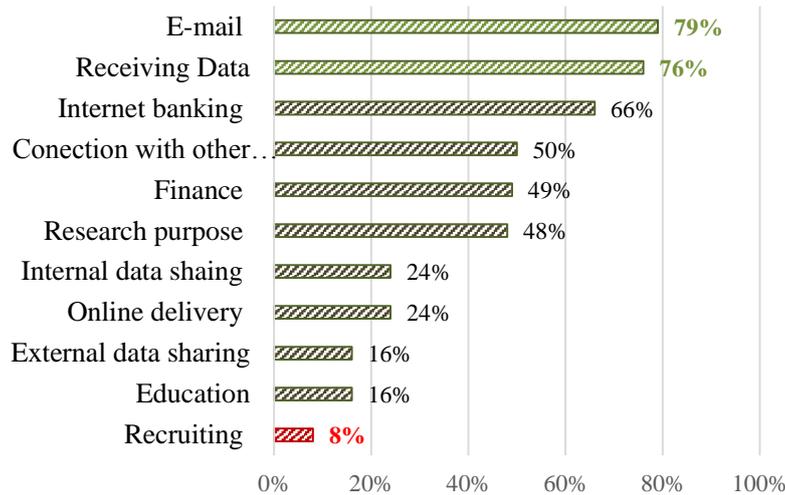


Fig 3. Activity type by using the internet in Iran's enterprises on 2012

Besides, digital- trade can be gone through both formal and informal divisions in tables 4 and 5.

Table4. Different dimensions of digital trade and e-commerce in formal sector of Iran

	Method	Description	Data source
<b>Formal sector</b>	Business-to-Business (B to B)	In case of online ordering or purchasing of other businesses' good and services either raw material or final products, the transaction can be tracked in both enterprises' accounting systems or in the SHAPARK database if they always use identifiable unique gateways.	1. ICT and e-commerce enterprise surveys 2. Financial Statement (Registration data)
	Business-to-Consumer (B to C)	The data of those enterprises receive ordering or sale good or services online can be gathered from different surveys as well as their registered accounting systems.	1. ICT and e-commerce enterprise surveys 2. Household surveys on internet use 3. Financial Statement (Registration data)
	Government-to-Business (B to G) Government-to-Consumer (C to G)	<b>E-Government:</b> now many of government's services are accessible online. Businesses or individuals who are looking for online services, also can pay online. All the online payments have done in one of the banking gateways with a true copy sending to the Central database in SHAPARK Co. Thus, all these transaction can achievable by registered data.	Administrative registers: e.g. trade statistics in custom clearance register, financial statement by Supreme Audit Court

Contrary to digital trade in formal and legitimate situation, there are an unlimited number of digital trade and e-commerce activities in informal and casual conditions.

Table5. Non-observe digital economy of informal sector of Iran

	Method	Description	Data source
Informal sector (non-observe digital economy)	Business-to-Consumer (B to C)	Many of businesses sale their product both good and services informally in the internet. They offer their products in illegal websites or social network like Instagram, telegram, Facebook etc.  All above transactions have not been navigated and tracked by other administers like tax office, statistical agencies and more although all the monetary transaction happen in banking system. In the other words, it is implausible to distinct those banking transactions in center database (SHAPARAK Co.).	Not Available
	Consumer-to-Consumer (C to C) <sup>1</sup>	According to the astonishing growth of the internet penetration rate in Iran, majority of people use their own privacy for doing business. They use weblogs, social network like <b>telegram</b> groups and channels, <b>Instagram</b> , illegal website etc. to sale their goods and services online.  Informally in most of cases, people give their own bank card number in order to pay/receive the money. Although these kinds of monetary transactions register in banking system and main database, it would be impossible to recognized them.	Generally, NA but Partly:  1. Household surveys on internet use (Partly)  2. enterprise and household expenditure surveys (Partly)

#### IV. Case study: Bazar Café startup as online platform

Bazar Café Startup has nominated as one of the pioneer’s mobile application which provide an online platform for internet user in Iran with focusing on android software. Bazar Café application offer a wide range of very exciting mobile applications comprise games, sport, entertainments, health, ethical, science, economic, social media etc. and it could have had 33 million users (approximately 45% of the total internet users and 1.4 person in each Iranian family) in Iran as shows in fig 4. In 2017, Bazar Café published 21500 developers and 111,600 applications which shows potential capacity to make substantial investment in this part. During 2017, Bazar Café app was used 4.8 billion times and 1.4 billion times installed or updated. Besides, by the end of the year, 1000 billion Rial was the developers’ income. As a biggest app stores for android in Iran, it offers both free and payable apps [7]. In order to measure the digital trade, it is not important haw many online platforms had been produced but the processes that statistical system encounter with them, how they have been registered, tracked, updated and what type of data flow they have will be crucial.

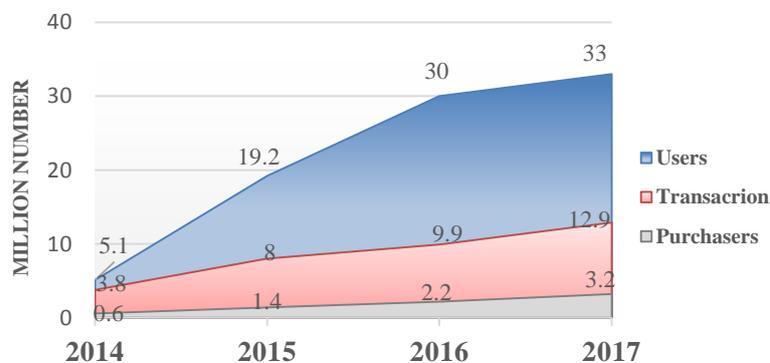


Fig4. The number of Bazar Café Users and transactions between 2014 to 2017

<sup>1</sup> Due to the economic and political imposing sanctions, individuals haven’t been permitted to have foreign exchange account or credits card in Iran.

Meanwhile, this startup could provide 20,700 and 10,350 direct and indirect employees (23% women and 77% are men) respectively by 1900 developer team and 1400 small-scale firms [8].

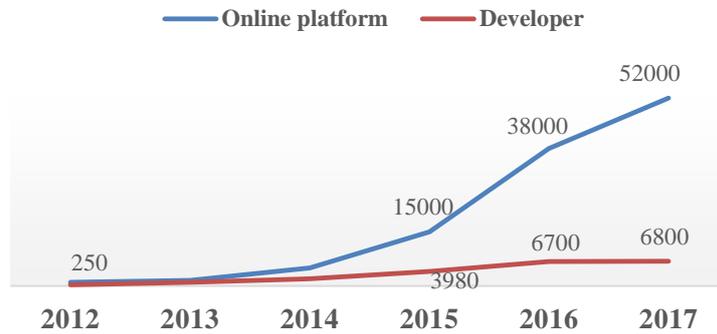


Fig5. The number of Bazar Café apps developers and published online between 2012 to 2017

According the statistical report [9], Bazar Café startup has been used by foreign users in other countries with 2% of all of the users. These foreign users comprise of 10% Turkey, 11% USA, 21% Afghanistan, 24% Iraq and 34% other countries.

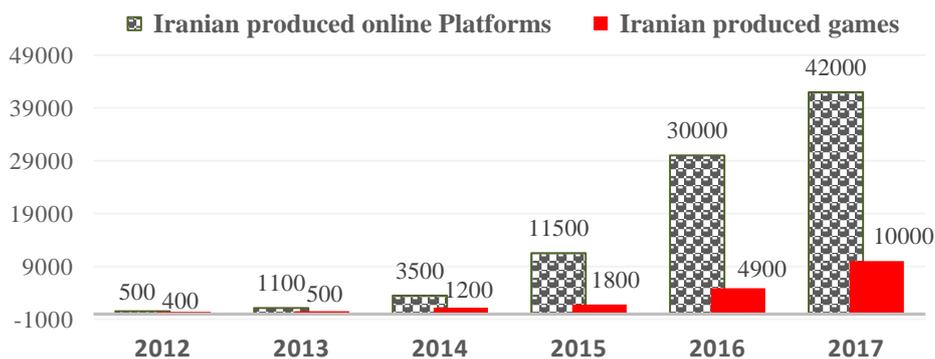


Fig6. The number of Iranian applications and games in Bazar Café app between 2012 to 2017

## V. Case study: Digital transactions report by SHAPARAK Co.

SAPARAK Co. is the last resort in all banking transactions and play as a main datacenter which maintain all transactions records. Meanwhile, based on latest report on 2018 [10], 93.61% of recorded transactions were purchasing and 6.39% related to bills and mobile charge. Totally, proportion of SHAPARAK’s transactions on liquidity was equal to 10.81 while amazingly proportion of these recorded transactions on GDP was 119.02 % (it is impossible in digital transaction to distinct the intermediate and final consumption). These astonishing rate was from 1,647,380,290 transactions with 1,760,068,425 million Rial.

Regarding to variety of digital gateways, all transactions were registered by Point of Sale (POS), Mobile Payment Gateway and the Internet Payment Gateway. The portion of each device from total transactions were 3.82%, 6.85% and 89.34% for the internet platform, Mobiles’ applications and POSs respectively while the transactions’ per capita population with are equal and greater than 18 were 27.62, 24.67, 1.89 and 1.05 for total devices, POSs<sup>1</sup>, Mobiles’ applications and the internet platform respectively.

<sup>1</sup> Points of Sale (POS)



Fig7. Digital transaction methods in Iran [10]

Table 6. description of digital transaction gateways in May 2018 of Iran

Device type	Transactions	Transaction per device	Transaction value (Million Rial)	Transaction value Per device (MR)
Internet platforms	62,868,993	85	185,336,910	250.60
Mobile Payment	112,803,859	117	7,799,551	8.07
POSs	1,471,707,438	212	1,592,931,964	229.42
<b>Sum</b>	<b>1,647,380,290</b>	<b>190</b>	<b>1,786,068,425</b>	<b>206.51</b>

According to the transactions number and physical cash spending for purchasing good and services during the different years, buyer has been continuously replacing digital payment instead of cash which approved in fig.7. Interestingly the amount of transactions falls at the beginning of each year which might be due to the new year's vacation in Iran.

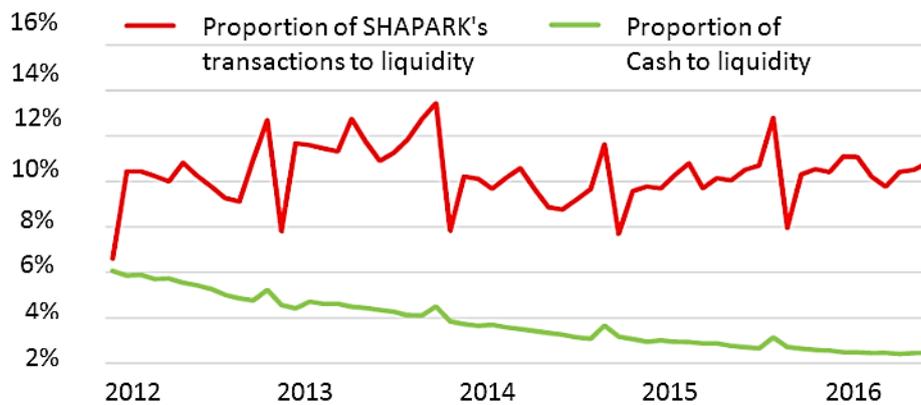


Fig8. Comparison between digital transactions and cash [10]

Digital payment and transactions has been snowballing trend as shows in fig.8 and it has ripple effect on other economic sectors. In the other word ICT and digital trade as role in Iran economic. For more illustration, in May 2018, 1,647 million transactions with value of 1,768 billion Rial has done in comparison with previous month with 1,449 million transitions and value of 1,178 billion Rial has 13.67% and 51.59% growth in the number of transactions and its value correspondingly. Similarly, May 2018 has significant growth in comparison with similar month on 2017 by increasing 28.29% and 34.44% in transactions and its value.

Table 7. problems toward digital trade in Iran

1. Surveys do not yet provide a detailed breakdown of the value of digital transactions.
2. In practice it may be difficult to separate the intermediation fees from the value of the services provided. In the other words, most users of digital services cannot separate the value of digital services from physical goods that they buy.
3. Measuring the non-observe digital economy (e.g. trade in social networks like telegram, Instagram etc.) has turned to the big challenge in Iran. ICT group has been looking for conducting a survey to build an estimation framework of this part.
4. How to separate digital and non-digital goods or services? What kinds of classifications or threshold should be defined?

Table 8. Suggestions toward digital trade in Iran

1. Using the potential of big data produced by the evolving digital economy, in particular by technologies such as the Internet of Things, cloud computing, and artificial intelligence.  
An intuitively straightforward option would be to add questions to surveys regarding the breakdown of online purchases and sales into domestic and international transactions.
2. Online surveys with anonym netizens as the respondents should emphasized to better understand the dynamics of digital transactions as well as profiles of digital transaction actors.
3. Customs clearance or internationals post offices (DHL, TNT etc.) database can be beneficial to separate those goods and services which had been digitally ordered.
4. Iran's NSO conducted "Household access and the internet individual users" (reference year 2017) with supplementary one-page questionnaire to gather online purchasing buy households 'member so as to provide HH19, HH20 and HH21 ITU's Indexes. Next year, the extra questions will be added to separate directly the value of goods and services, intermediate consumption, related costs, payment details, origin, kind of platform, type of products etc. so as to better calculate the added value in this sector.
5. Conducting a survey for online platforms (those active in digitally ordered, enabled and delivered) and legalized and registered websites (those using legal banking gateways) with input-output approach

## VI. Conclusion

Digital trade and e-commerce has turned to an inseparable part of the economy and due to the developing trend, National statistical system and especially NOSs should try to provide official statistics for tracing and preparing adequate internationally comparable data. Regarding to the impediment current capacities to provide related statistics, this is study attempts to provide an outlook of digital trade capacities and infrastructure in Iran with focusing more on gaps and challenges. As a developing country, Iran has faced with remarkable difficulties like non observe digital economy to fully measure the digital trade and ecommerce. The results would be worthwhile for other developing countries.

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