

# A Methodical Plan Towards Smart Economy in New Egyptian Cities

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## Abstract

**INTRODUCTION:** Initial patterns of urbanization world demonstrate differing scenarios in different continents, requiring diverse methodologies, policies, and strategies. The information & communication technology (ICT) leads to the development of the city management and smart economy which does not adhere to borders and nationalities. The Egyptian economy passed through various stages of development in the last few years, the government policy has National Egyptian initiatives towards the Smart Economy.

**OBJECTIVES:** Stand on the structure of the smart economy to draw the path for Egypt's local economy to evaluate the existing economic state and conclude to a guiding methodology towards the smart economy in new Egyptian cities.

**METHODS:** Analytical approach to investigate "concepts, the smart economy as a pillar of smart city, urban entities, examples of smart economy projects around the world". Cross-analysis between national governmental initiatives in Egypt to support the smart economy and some development indicators in the new cities.

**RESULTS:** The difference in the locations, inhabitants' nature of new cities, requires various and varied approaches to process towards the smart economy.

**CONCLUSION:** The research proposes an adaptation methodical plan for developing the smart economy concept in New Egyptian cities, this plan depends on the constants, variables, policies on both national & local levels.

**Keywords:** Smart Cities – Smart economy – Egyptian governmental initiatives – New cities

Received on 05 December 2019, accepted on 14 May 2020, published on 21 May 2020

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doi: 10.4108/eai.13-7-2018.164661

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## 1. Introduction

It is the time of a global urban transition; cities are reflected as the main forms of achievements in human civilization over the ancient and modern history, and the location of economic activities. At present, cities are the source of goods production and services for both internal and external consumption. Cities embody a sense of innovation—all aided by the incessant technological progress that man develops every day. Today's city is a high-speed communication hub with a complicated

system of information and communication technologies' (ICTs) infrastructure [1].

Cities become an engine of economic growth due to fast communication devices; laptops and mobile [2]. Cities also act as 'magnets of hub and 'centre of well-being' for a vast array of skilled and unskilled people who are looking for a better quality of life. Cities can perform these miscellaneous functions as they proclaim to have better infrastructure and services (compared to their rural counterparts), which aid their economies and related creative and technology-driven production procedures. [3]

The concept of the smart city is based on a municipality that uses information and communication technologies to improve the quality of government services, increase operational efficiency, and share information with the public. The UK Department for Business, Innovation, and Skills (BIS) defines the term smart cities as: "a management process, in which increased citizen engagement, infrastructure, social capital, and digital technologies make cities more livable, resilient and rise its ability to face challenges" [4]. The British Standards Institute (BSI) defines the smart city as "the active integration of physical, digital and human systems in the built environment to realize the better future for its residents [5]. The smart economy is one of the main pillars of the smart city.

## 2. Research Methodology

- The study depends on an analytical approach to investigate the concept & aspects of the smart economy focusing on its applied projects and urban utility.
- Related reviews of the literature of the smart economy (definition & structure) were collected. An Inductive analysis approach of plans and projects was reported from the smart cities around the world in an attempt to draw the path in which how the city's economics can be transformed into smart.
- Cross-Analysis between the Egyptian national initiatives towards the smart economy and the local development in new cities to evaluate the current situation.
- A Methodical Plan Towards Smart Economy in New Egyptian Cities is suggested as a result of the evaluation of the current situation.

## 3. The Smart Economy

### 3.1 The smart economy concepts, definitions.

The smart economy, in general, is the concept which concerns with the knowledge economy, where innovation

and technologies are well-thought-out as the main sources of powerful force [6]. There are many approaches to illustrate the structure of the smart economy such as:

- Smart Economy is a concept of how to realize the best for the existing and future generations at the same time, through policies that encourage innovation and creativity combined with scientific research, higher technology, and care for the environment. [7]
- It is a multidimensional concept, described by three unified dimensions: economic, social and physical.
  - Economic:** as there are innumerable opportunities and economic resources, allowing all groups in society to obtain a good income to achieve a good standard of living. [8]
  - Social:** the smart economy provides the best health and education standards that enable an individual to build his capabilities intelligently and effectively
  - Physical:** where the smart economy enables the individual to take advantage of his capabilities in achieving self and community development.
- The Smart economy uses networks to organize the innovation clusters and shared cooperation between enterprises, research centers, and the citizens to sustainable development. [9]
- Smart economy supports the enterprise through the expenditure of human resources (knowledge, skills, and creativeness), changing thoughts into valuable practices, products, and services [10]

### 3.2 The smart economy as the main pillar of smart city

Smart City System consists of six pillars: (i) smart people, (ii) smart city economy, (iii) smart mobility, (iv) smart environment, (v) smart living, and (vi) smart governance. Each one of these pillars has its characteristics to contribute to the smart city system and closely interlinked with the others. The research illustrates it in the following table. [1]

Table 1. pillars of smart city system

Smart people	Smart economy	Smart mobility
(1) People should be E- learners. (2) Open-minded (3) Have a good healthy life. (4) Work professionally. (5) have a high human development index (6) Flexible, resilient to changes. (7) Participate in public life.	(1) Understands its modern economy. (2) Is driven by technology & innovation and supported by universities, (3) Has enlightened entrepreneurial leadership. (4) Economic opportunities for all people categories.	(1) It focuses on people's mobility, to reduce the vehicle's movement. (2) Supports & encourages walkability and cycling. (3) It has vibrant streets (at no additional cost). (4) Good management of traffic congestion.

<p>(8) A smart city maintains a high Graduate Enrolment Ratio and has people with a high level of qualifications and expertise. (9) Its inhabitants aware of lifelong learning and use e-learning models.</p> <p><b>Smart environment</b></p>	<p>(5) Uses local material, develop national production. (6) Accepts globalization challenges. (7) Promotes a sharing economy. (8) Thinks locally, acts regionally, and competes globally.</p> <p><b>Smart living</b></p>	<p>(5) Sustainable transport system. (6) Has balanced &amp; innovative transportation options. (7) Will has integrated mass rapid transit systems, such as metro rail, light metro, monorail, or ‘sky train’ for high-speed mobility. (8) high-speed mobility in density areas.</p> <p><b>Smart governance</b></p>
<p>(1) Protects and values the natural heritage, unique natural resources, biodiversity, and environment. (2) Is attractive and has a strong sense of place that is rooted in its natural setting. (3) Conserves the ecological system in the city region. (4) Embraces and sustains biodiversity in the city region. (5) Efficiently and effectively manages its natural resource base. (6) Has recreational places for people of all ages.</p>	<p>(1) Respects the local history, culture facilities, and nature. (2) Active downtown, 24 h and 7 days a week. (3) Provides women, and children, senior citizens with safety, security and Ideal place. (4) It improves the urban way of life. (5) Uses natural and cultural assets to build a good quality of life. (6) Deals and concerns with all small details of citizens. (7) Has high-quality houses and open public spaces.</p>	<p>(1) Has practices of transparent decision (2) uses &amp; operates through intelligent technologies and spatial data to make the decisions. (3) Constantly innovates e-governance for the benefit of all its residents. (4) Has the ability to deliver public services in an efficient and effective way. (5) Has a participatory vision from the society in, planning, budgeting, Implementation. (6) Works in the aim of sustainable urban development strategy</p>

### 3.3 The linkage between the smart city pillars.

From these main pillars, we can summarize the main keywords for a smart city in the opposite Fig. 1, we can determine what the smart city should offer to its citizens:

An adaptable, accessible, reliable, scalable, and resilient way for living, such as:

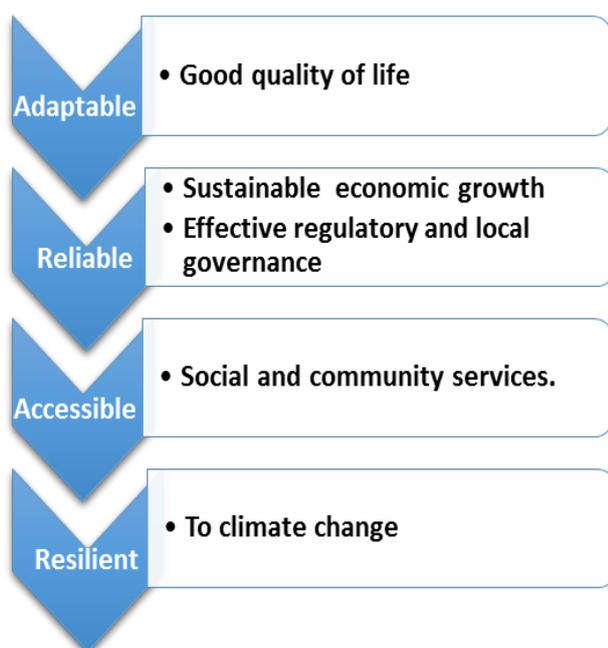


Fig. 1. The linkage between the smart city pillars

- Good quality of life for its residents.

- Sustainable economic growth with different job opportunities.

- The easy life of access to social and community services.

- Create a sustainable environmental approach to development.

- Ensure efficient service and infrastructure such as water supply, public transportation, drainage, communication support, and other utilities;

- Resilient to climate change and environmental matters.

- Provide effective controlling and local governance tools ensuring impartial policies.

So the smart economy is the main core of the smart city. It drivers the city initiatives, determining the degree of economic competitiveness through innovation, entrepreneurship, brands, productivity, labour market flexibility, as well as integration between the local and global markets.

### 3.4 Urban basis entities & projects for the smart economy

The urban society illustrates the structure of the smart economy as a developed urban area that creates a better quality of life through sustainable economic development, using human resources, social capital. Many Urban entities can support the smart economy; the research will list examples in this field in the following lines:

#### 1. Smart creative industry

The smart creative industry reconnoitres smart solutions using intellectual technologies, to optimize the industrial operations towards an optimal value chain. It has: technologies and

communications support, access to international & National trade, Market competition, Internet services, and free flow of ideas.

Therefore, the Smart City ideas are the capitalization of ideas and skills of city development. And it is built by governance in different degrees and also by different associations and technological interpretation.

**2.Clean and green industries**

Green Industries is an economic activity that aims to minimize its effect on our environment, so it ropes the green economy to decrease giving out to air, water, and soil from the industry. The Green Industries endorses the globular economy, resource efficiency and the conservation of natural resources. [11]

**3.Free trade zone – special economic zone**

FTZs are established to speed up development by creating a highly business environment and encourage foreign investment. The idea of a free trade zone is a custom of the hubs countries which invest their outstanding location to attract businesses through cost advantages and preferential treatment. They, thus, contribute to the change of the national economy as a whole. It moves on from being a labour-intensive economy to skills and technology-intensive one.

**4.Smart E-commerce and shopping**

Electronic commerce is the transaction of goods or services over computer networks, mostly social media channels and the internet. E-commerce stages provide people with e-commerce software and services, through different technological devices such as funds transfer, digital marketing, mobile banking, mobile commerce, internet marketing, supply chain management, electronic data exchange, record management systems, and automated data collection systems. These services help to reduce the time of delivery after automatic

payment is made, which ranges from a few hours to many working days.

**5.Smart real estate**

A smart real estate is a platform for managing the process of real estate trading and dealings with numerous solutions anywhere and anytime. The new platform allows complete operations of displaying and sale of real estate utilities using internet browsers and smart devices, so it's comprehensive numerical management of real estate dealing, excluding paper documents and decreasing brokerage procedures.

**6.A Smart Work Centre (SWC)**

It is an office centre within the closeness sites of a residential community, which provides space to citizens in an individual or a group work setting, through the use of IT technologies and multiple applications. The local community can get daily needs as child daycare, high-end catering services, financial services, supplemented by good access to highways and public transport. So the benefits of a smart work center are :

- (1)Provide the citizens with a physical workspace close to their residence, resulting in minimize transportation demands and achieve good productivity.
- (2)Support and help local citizens in the local community.
- (3) Gathering employers can provide their workers with flexible working space options.

**3.5 Examples of different economic projects in smart cities around the world**

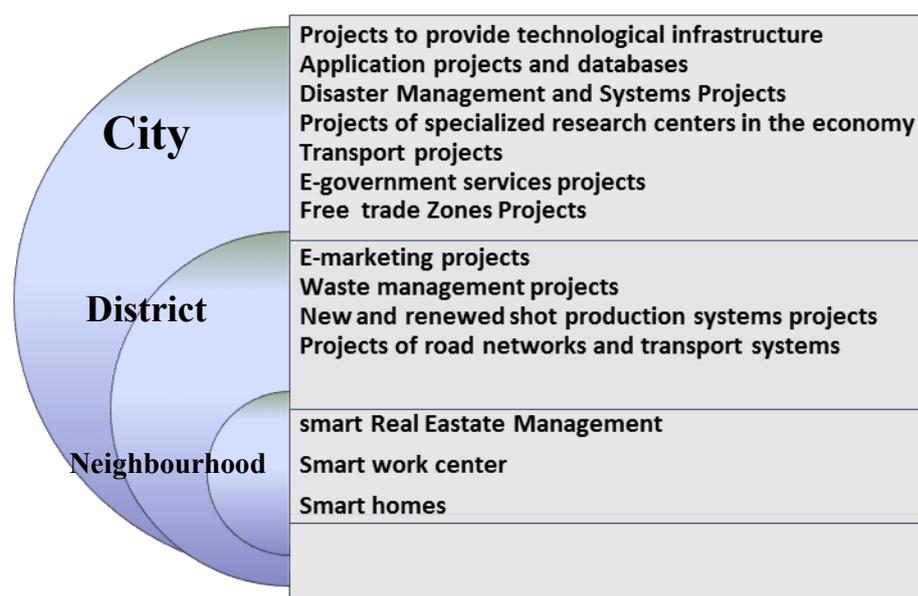
According to the previous Urban basis entities, the research has collected examples of different economic projects that have been applied in smart cities around the world as illustrated in Table 2.

Table 2. Examples of different economic projects in smart cities around the world

City	projects
London	<p><b>(1) Creating new technology jobs:</b> Smart London Export programmer using citizen's initiatives.</p> <p><b>(2) Create new district heating networks.</b></p> <p><b>(3) Implementation of congestion charging, ‘Oyster’:</b> smart ticketing, announcement information of real-time travel for buses.</p> <p><b>(4) Talk London:</b> a collaborating website aims to comprise citizens in policy discussions,</p> <p><b>(5) London Data Store:</b> gives citizens access to the city data from different public departments.</p> <p><b>(6) London Boroughs:</b> online services of saving money by moving to and joining with neighbouring on transporting them</p>

<b>Amsterdam</b>	<p>(1)<b>City-Zen</b>: virtual Power Plant: Storage and trade of surplus solar energy through home batteries</p> <p>(2) <b>Smart Flow</b>: optimize traffic through smart data and different applications, enhance parking efficiency, and promote eco-friendly.</p> <p>(3) <b>Smart Energy Playground For the Whole Family</b> : reinventing the first gaming platform by transforming the generated energy into lights,</p> <p>(4) <b>Thousands of businesses, households, and Job opportunities through</b> (1) pick up garbage, along with solar panels powering bus stops (2) Energy-efficient roofing insulation, automatically lowering light switches, smart meters, and ultra-low energy LED lights.</p>
<b>Tokyo</b>	<p>(1) <b>Combined solar panels</b>: Tokyo’s corporate collaborations have generated homes with storage batteries, and energy-efficient applications connected to a smart grid.</p> <p>(2) control of over <b>100 train lines</b> and transporting upwards of 14 billion passengers per year</p>
<b>Dubai</b>	<p>(1) <b>The Investment Map</b>: It’s a combined application that can be used by businessmen, developers, Citizens, Visitors can do real estate best practices through clever real estate market applications :</p> <p>Enable the investors to access many investment project opportunities through their smart devices.</p> <ul style="list-style-type: none"> <li>▪ Allows complete process of displaying and sale of real estate from start to finish using Internet browsers and smart devices (Android, IOS). Allows developers to propose their projects to concerned investors from all over the world.</li> <li>▪ The investment Map project was implemented by Google Inc. performs</li> </ul>

Based on the previous section, the needed essential projects for the smart economy in cities distributed according to City –District – Neighbourhood were concluded as shown in Fig. 2.



**Fig. 2.** The needed essential projects for (City –District - Neighbourhood)

#### 4. Steps towards a smart economy in Egyptian cities.

#### 4.1 Egypt sustainable development strategy

Egypt has economic growth, averaging 3%–5% from 2016 to 2019 [12]. Egypt has adopted an

investment policy as the main key to economic growth. The investment policy depends on reducing obstacles to how international companies invest and run in Egypt, which enhance employment opportunities and increase Egypt's competitive power across the region. Main challenges faced Egypt throughout the past few years as follow:

### 1.The increase in population growth rate.

Egypt is one of the most overcrowded countries in Africa and the Middle East. The assessed population of 2019 is 100.39 million instead of 72.7 million in 2006. Egypt takes the place of 14 ranks in the world. The population of the capital, Cairo, around 10.902 million (estimations, 2019) [13]. The density of Egypt as a whole is 84 people / square kilometers. Cairo has a heavy density of 46,349 per kilometer square. Overall, Egypt ranks 126th in the world in terms of population density [14]. A majority of the population survives on the sides of the Nile River, in an area of 40,000 square kilometers. Cairo, Alexandria, and Giza are the three largest cities in the country.

### 2.Lack of clear sustainable policy to allow utilizing human resources in a way that would contribute to human development.

These vital problems were the incentive to do this research, where Egypt needs to make changes to systems, infrastructure, and economic progress to achieve the benefits of the development. Citizens need a decent quality of life; this includes main keywords sufficient freshwater; worldwide access to domestic energy, the ability to mobile efficiently from one point to another; a sense of safety and security.

Egypt economics had faced what may seem to be conflicting objectives. Due to the instability of political conditions through the 30 years ago, so there's a vital need to restore economic permanence to achieve better standards of living with more job opportunities, less poverty, well health and education systems. These are the main reasons why people ran to the streets in 2011. At the same time, there's a long-standing need to reduce budget deficits, public obligation and inflation, and adequate foreign exchange funds.

Egypt launched in 2016 the country's sustainable development strategy for the next 15 years intending to raise Gross Domestic Product (GDP) growth to 12 percent in 2030, up from the 4.2 percent attained last fiscal year, while reducing the budget deficit to 2.28 percent from 11.5 percent. The sustainable developing strategy incorporates economic, social, and environmental dimensions in addition to knowledge and innovations,". [15], In conjunction with that Egypt's ICT 2030 Strategy concentrates on the dimensions of sustainable development, with three pillars:

**The economic pillar:** highpoints economic development, transparency and efficiency of governmental organizations, energy, and investment. There are pilot programs (business setup – boost a business –market access- skills development – support services – invest in Egypt).

**The social pillar:** highlights education and training, health, culture, and social justice.

**The environmental pillar:** focuses on the environment and urban challenges. [16]

## 4.2 National Egyptian initiatives towards the Smart Economy

The government of Egypt has launched the main programs to achieve the strategic targets through three main goals, namely; economic development, the competitiveness of markets and human capital. These programs seek to:

1. Law 15 of the year 2004 - Information Technology Industry Development Agency- is considered the first step of the technological support of governmental entities. This law aims to floor the way for the transmission of the e-business services in Egypt capitalizing on different decrees of the authority as activating the Egyptian e-signature law and supporting an export-oriented IT sector in Egypt.
2. Maximize the use of local energy sources – traditional or renewable – and the development of the productive capacity of the energy sector to be more effective in boosting the economy and adapt to the ever-growing changes in the field of energy.
3. Promote human resources through two main axes; education and health, It also includes fair access to the basic health interventions for all citizens by up to 80 percent and ensuring 100 percent coverage of vaccinations nationwide.
4. Seek to place 10 Egyptian universities on the list of the top 500 universities in the world.
5. Adopt a more effective administrative & transport system by increasing services provided by non-governmental organizations.
6. Stipulates placing Egypt among the top 40 countries in reducing waste in government spending, and to be among the top 20 least corrupt countries in the world.
7. Include major reorganizations in the fields of ITC industry and investment.
8. Establishing some principles of smart cities & smart economics in developing new cities that are being planned, such as

New Administrative Capital and New Allaman.

initiatives and its effects for supporting the pillars of smart economy.

The research presents and evaluates in the following section - Table 3. - various government

Table 3. National initiatives and its effect to support the smart economy

Government Initiatives	smart economy pillars								
	Innovation	Supported by universities	Diverse economic opportunities.	Work locally but think globally.	Make strategic investments	Supports, and promotes sharing economy.	The high flexibility of the labour market.	Welcomes human resources	Sustainable natural resource
Encouraging investment in all fields									
Establish a new administrative capital.									
Development of the Suez Canal region as a logistics hub.									
Restructure of governmental agencies.									
Digital transformation and automation of government systems.									
Issuing the Law of the Incentives of Science, Technology, and Innovation, issued No. 23 of 2018.									
Establish a science valley, technology incubators, and technology companies.									
The exploitation of Egypt's geographic location as a hub for aviation and transit tourism.									
Adopt a program to enhance the competitiveness of the Egyptian product in local and international markets.									
The trend to rely on the local product in the industry.									
The national project of grid-connected small scale solar systems.									
Programs to support small and medium enterprises.									
Establish technology universities.									

<b>Transforming cultural institutions into centres for the development of creativity</b>								
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From the table we can conclude the following:

- (1) There are many government initiatives and attempts to go towards the ICT system in Egypt, which supports most pillars of the smart economy.
- (2) The government is focusing mainly on the policy of supporting domestic and foreign investment in economic development, which helps the exchange of expertise in various fields.
- (3) The linkage between the universities and the researches centres is missing especially on the local economy level.

### 4.3 New Egyptian cities as a key for economic development

Egypt has 249 existing populated cities in 27 governorates and 42 new cities distributed in all governorates [17]. Recently, most of the foreign &

national investments are headed to the new cities in addition to its current economic base. The industry is considered one of the main economic bases of Egyptian cities, in addition to services, and trade.

The new cities have urban plans and specific infrastructure that can be developed and transformed into smart if they are Compared with existing cities.

Numbers of different new Egyptian cities in different regions were chosen, belonging to the urban and Agricultural governorates to show some indicators about the economic base and the percentage of investments shown in table (4) as follow:

- East Cairo: El-Shorouk - El-Obour –Badr – New Cairo.
- West Cairo: 6th of October - Sheikh Zayed.
- Delta Region: 10 Ramadan - New Damietta.
- Alexandria Region: Borg El arab.
- North Upper Egypt Region: New Fayoum.
- South Upper Egypt Region: New Assiut.

Table 4. Indicators about the economic base and the percentage of investments in some new cities in Egypt

City	population		Area ( 1000 Fadden )	No of factories		Job opportunities	Investment (Billion EGP)
	Actual (1000 person)	Target (1000 person)		working	under construction		
<b>10 Ramadan</b>	850	2100	95	2997	1028	500000	29.2
<b>New Damietta</b>	169	500	6.67	516	206	18696	7
<b>6 October</b>	1500	3000	171.4	1690	694	148000	35.8
<b>Zayed</b>	350	675	10.386	-	-	-	5.3
<b>New Cairo</b>	1000	2000	85.580	67	290	6000	32.6
<b>El Shrouq</b>	340	500	16.110	-	-	-	7.3
<b>Badr</b>	180	840	18.500	564	730	30000	9.6
<b>Obour</b>	600	900	13.416	1283	754	111000	11.4
<b>Borg El arab</b>	166	750	47.403	1299	840	11500	4.9
<b>New Fayoum</b>	3500	140	12851	6	426	5000	1.1
<b>New Asuit</b>	35	750	30.000	7	50	200	4.1

Fadden = 4200 square meter

Source: The official website of the New Urban Communities Authority, [www.newcities.gov.eg](http://www.newcities.gov.eg) [17]

From the table we can conclude the following:

1. The new Egyptian cities can be divided into 3 categories.

**First:** cities have high numbers of investment and job opportunities (the strong economic base) such as 10 Ramadan, 6 October, and New Cairo, all of them are located in the greater Cairo region.

**Second:** cities have low numbers of investment and job opportunities such as New Damietta, Badr, Obour, New Borg El Arab, New Fayoum and New Asuit.

**Third:** Cities have no industrial economic base: such as Zayed and El shrouq.

2. Cities around the capital Cairo attract the largest amount of investment.
3. Cities in the Upper Egypt region have limited chances for attraction investments.

The research proposes an adaptation methodical plan **for developing the smart economy concept in New Egyptian cities** illustrated in the following Fig. 3.

## 5. Results

- The new cities in Egypt have attracted investments through the last 30 years, so they have created a lot of job opportunities through their industrial zones which are considered one of the key sectors that supports the economy and national production.
- The Egyptian government is moving towards the digital transformation with quick steps although the knowledge and technology sector is still nascent, it is supported by government initiatives at the national level.
- There are no trails to settle the ideas of the smart economy at the local levels in new cities.
- The difference in the locations, inhabitants' nature of new cities, requires various and varied approaches to process towards the smart economy.

## 6. Recommendations

- Each new Egyptian city has a special nature in terms of Location, population, and economic base. Due to the nature of the smart economy which depends on the use of human Capital-knowledge, skills, creativity, and natural resources, each city needs a special integrated plan which can take it towards the smart economy.
- That local communities in Egypt need an intermediate link that can be identified as smart economy & technology companies. This new sector can be used to create economic bases for cities whose development has not specific economic bases such as the cities of Zayed and El Shorouk and demonstrates programs and projects of the smart economy that can be applied in the other cities according to their economic bases.
- Setting an executive framework for applying smart economy programs & projects within new cities developing plans through the participation of individuals and the private sector.
- Providing urban and technological entities to support the transition towards smart which integrates with the economic base of the city.

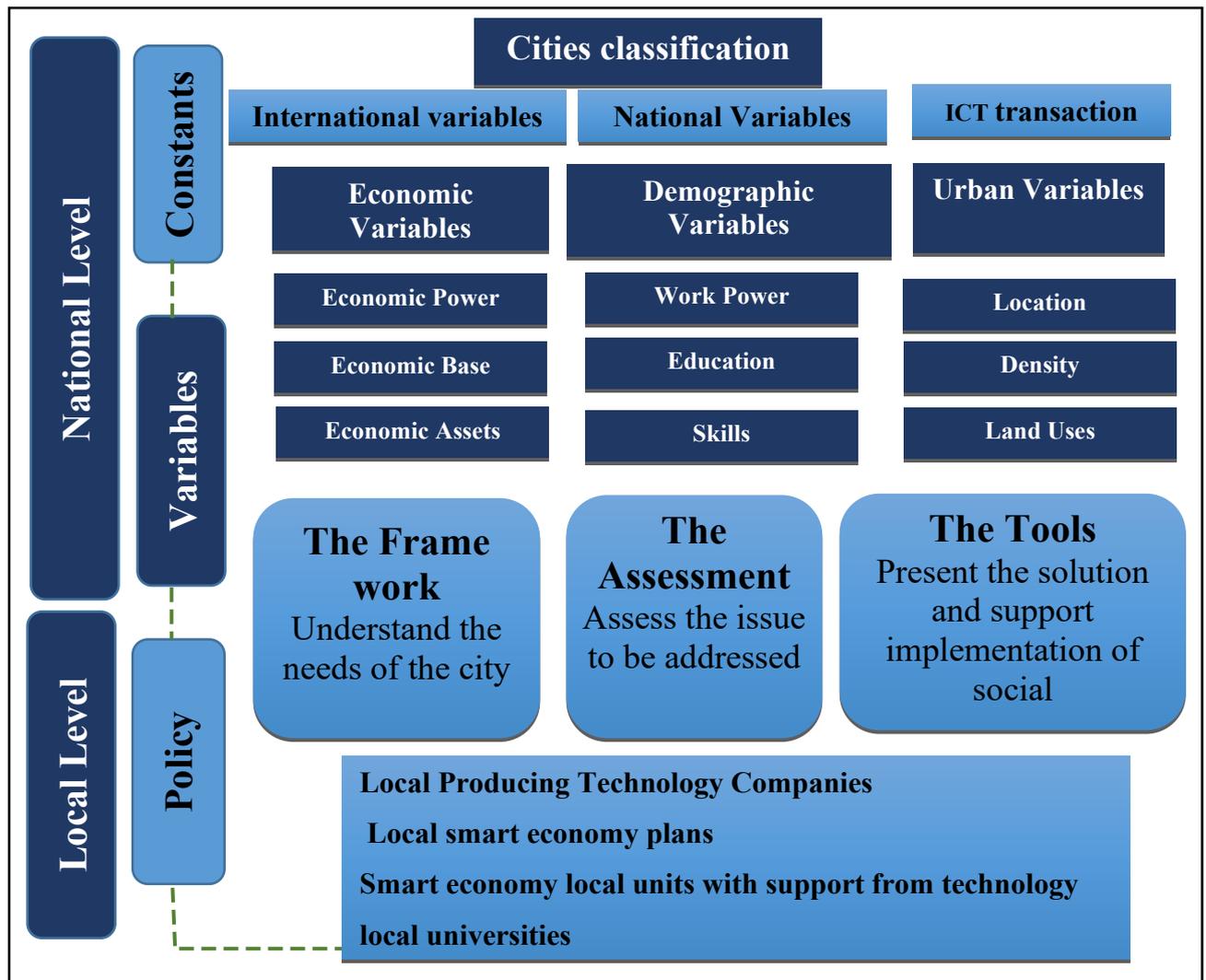


Fig. 3. proposed a methodical plan for developing the smart economy concept in New Egyptian cities

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