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## **Identifying Opportunities and Challenges of Human Resources in Smart Development Projects in Egypt**

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### **Abstract**

Design and building of Smart development projects (SDP) has arrived to be one of the most essential targets by most of the countries worldwide. This is due to the positive impact on the qualities of countries living standards, economic situation and human working force engagement. The Egyptian 2030 strategic plan (2016) aims at constructing SDP with identified specific vision and strategy in Egypt. Despite, the design and building of SDP in Egypt is expected to offer many (HR) opportunities, but also it shall generate different challenges which might lead to drastic failures. Technological solutions, among those challenges, must be understood as a tool to achieve goals and to tackle the challenges cities must face Helfert (2015). Skilled workforce is another major concern for development of SDP. According to Fails Management Institute's (FMI) talent development survey (2015) 86% of respondents reported that their company was witnessing skilled labor shortages. Thus, the main aim of this paper is to identify human resource key Opportunities and Challenges arising from the internal and external stakeholder's environments, where the paper assumes that such HR factors can impact the success of delivery of design and building of SDP. The paper undergoes a review for human resource challenges and opportunities in design and building of SDP. The factors were studied for case studies highlighted mainly from developed countries with an emphasis on the case of Egypt. A qualitative analysis was then performed to identify the key challenges impacting the success of building and designing new SDP. By the end of the paper a complete risk breakdown structure was obtained including key HR challenges and opportunities. The identified factors can then be successfully lamented into the development of Egyptian smart cities. The paper adds knowledge value in human resource project management concerned with building new smart projects.

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### **Keywords**

Smart Development Projects (SDP); Human Resource(HR); Project Management(PM)

## **1. Introduction**

According to El Deen (2014), design and building of new cities is said to be one of the focal points targeted by different countries. The design and construction of smart development projects (SDP) is said to reflect major opportunities for both organizations and the country hosting such projects. The intervention of this project into

the Egyptian industry can enhance great achievement by minimizing Egypt unemployment rate (Adel, 2016). In addition, strategic goals can be achieved seeking successful delivery of SDP. Based on the World Bank Report (2016), around forty-three percent of the Egyptian population live in two hundred and twenty-three cities. Besides, fifty-six percent of this population are localized in the Greater Cairo Region (GCR) and Alexandria. Thus, SDP are to be considered as a solution for improved urbanization in Egypt.

Despite opportunities obtained, more challenges are to be managed successfully by the construction of new SDP in Egypt. Those challenges mostly arise because of the use of advanced technology and due to the human resources working within the Egyptian contextual environment. Both design and building of SDP needs higher technological skills and background. However, in a study of unemployment in Egypt done by Adel (2016), it was recognized that the probability of unemployment increases significantly from a gender to another. Policy makers within the Developing countries need to adopt a clear multilevel highly collaborative strategy for HR development (El Badawy et al, 2014). In this line, the new Egyptian strategy 2030 ensures that flexible policy and transparency with stakeholder's will both present Egypt's core motivator for strategic SDP investments. Poor management of these challenges could lead to negative impact which can overcome any benefits gained from building new SDP (Helfert, 2015).

Human resources roles in design and building of SDP are considered to be one of the major elements affecting their success specially within the Egyptian context. Thus, this paper aims to recognize human resource key Opportunities and Challenges for developing countries and Egypt which arises from both internal and external stakeholder's environments. The factors were studied for case studies highlighted from developed countries with an emphasis on the case of Egypt.

## 2. Methodology

In order to recognize human resource challenges and opportunities towards successful building and designing of SDP in Egypt. First, the authors suggested a coding system for opportunities and challenges in the light of improving Egyptian smart cities development. The coding of human resource challenges and opportunities was followed by a global review for researcher's efforts in identifying human resource factors which could help in achieving successful design and building of smart projects. In the benefit of Egypt and in order to cope with previous case studies, a group of case studies conducted from developed countries projects were then analyzed to verify the identified opportunities and challenges that were extracted from literature sources, those factors were then categorized using the risk break down structure. Finally, the paper assessed a detailed interaction between the literature review researcher's literature and the case studies.

## 3. Proposed Coding System for Identification of Human Resource Factors

In order to identifying human resource factors, the authors suggested a HR coding system. This system is presented in Table 1. The development of smart cities in Egypt requires a clear recognition of challenges and opportunities impacting organizations as well as countries hosting their design and construction. Thus, the goal of this code is to clearly realize possible HR challenges and opportunities. The table presents HR factors in terms of internal and external opportunities and challenges.

Table 1. Human Resource Coding System, by Authors

Human Resource Challenges and Opportunities in the Construction Industry			
Human Resource Challenges		Human Resource Opportunities	
Internal (A)	External (B)	Internal (C)	External (D)
A.1 Availability of work force	B.1 Available HR	C.1 Government Support	D.1 Improving Countries Human Resource Skills

*Continued on next page*

Table 1 continued

A.2 Employee Diversity	B.2 Flexibility of Policy	C.2 Improving Level of Intelligence	D.2 Solution for high population
A.3 Globalization and multicultural diversity	B.3 Lack of Smart Cities Data Base	C.3 Increasing Competency Chances	D.3 Providing More Job Opportunities
A.4 Integrating HR with Technology	B.4 Required Technology	C.4 Improving Human Resource Skills	D.4 Improving Political Environment and Trust
A.5 Construction Safety	B.5 Poor Governance Systems	C.5 Attracting Talent Employees	D.5 Increasing Investments
A.6 Decentralized Work Sites	B.6 Weak Economy		D.6 Improving HR Use of Technology
A.7 Employee Involvement			

#### 4. Exploring Human Resource Factors through International and Local Literature

The following part of this paper undergoes a comprehensive analysis for the HR opportunities and challenges that were discussed in literature either internationally or locally within the Egyptian context.

##### 4.1. A Review for International Literature on Human Resource factors

The success of delivery for SDP worldwide is maintained through the exploration of researcher reviews. Thus, several researchers have tried to recognize HR challenges and opportunities in order to maintain successful delivery of projects. Shown in Table 2, a review for authors description regarding identified human resource challenges and opportunities. The table highlights the importance of each challenge and/or opportunity identified from researcher's views. In the light of identified success factors, authors opinions are highlighted for further clarification and understanding. It is concluded from the review analysis that most authors emphasized the importance of engaging HR work force into the organizational decision-making systems. In addition to that, training should be supported for individuals working within the organization to be upgraded with new technologies.

Researchers further ensure the presence of talented employees who can improve the organization productivity. Authors also described the importance of managing the diversity problem inside the organizations, which might be due to multi culture human work force, most probably found in international organizations. It also exists as a gender diversity, where authors suggest that engaging different gender may be an optimum solution for lack of talents and could improve organization efficiency and productivity. It can be clear that managing challenges induced within a construction organization can actually lead to successful delivery of SDP. Thus, organizations will be able to achieve their objectives and deliver projects within budget cost and planned schedule.

Table 2. A Review for the Literature of Identified Human Resource factors, authors after extant literature

Author	HR Categ.	HR Factor	Description
Urdal 2006	O	Solution for Unemployment Good Working Environment	Relation between Unemployment and Improving Political Environment
Azeng et al. 2013	C	Harsh Working Conditions	African Countries Political Instability
APM 2015	C	Low Experienced Work force	Stakeholder's Work Force Challenges Towards Projects Successful Delivery

*Continued on next page*

Table 2 continued

Global Gender Gap Report 2014	C	Workforce Diversity.	Increased participation of women in the workforce has a positive impact on a country's economy
Aguirre et al. 2012	C		Workforce participation rate of women to equal men could raise the Gross Domestic Product (GDP) per capita by an incredible 34 percent
Okoro 2016	C		Embracing a diverse range of talent will contribute to addressing the huge rise in numbers of project managers.
		Shortage of Skilled Employees	People with the intellect they bring, along with their numerous soft skills, diverse experiences and behaviors contribute to overcome challenges and achieving project success
		Low Technical Skills	Integrating People and Technology is indicated to be a global issue to be addressed in all regions
APM 2015	C	Employee Diversity	Women project managers often earn less than their male counterparts
Arras 2015			
Henderson et. al., 2013	C	Project Management Risks	Issues highlighted by project managers
Zhang et al 2008	C	Culture and Gender diversity	Bad workforce diversity may arise many problems like the difference in gender or culture
Dulaimi 2011	C	Culture Diversity	The Culture variations problems between employees
Shifnas 2016	C	Low Productivity	Firm's managing team, as they need to use that diversity towards the firm's favour, or they will be facing problems like less productivity, conflicts between workers.
Aullin 2011	C	Employee Diversity	Ensure an equal opportunity exists for females working in design and building sector, neglecting the gender negative considerations
Gaston& Khalid 2010	O	Unavailability of efficient information and communication technology	Fragmentation of production and the development of information and communication technology
Parker 2005	C	Cultural Diversity	Characteristics of globalization: growing worldwide interconnections; rapid and discontinuous change; growing numbers and diversity of participant; greater managerial complexity

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Table 2 continued

PMBOK 2017	C	Poor Project Management by Organizations	An organization's Culture, Style, and Structure influence how projects are performed.
Marchewka 2014	C	Multicultural Diversity	Characteristics of a multi-cultural project as "multicultural projects can be international projects or domestic projects whereby an organization is attempting to diversify its workforce
Bennett 2013	C	Poor Communication and Internship between workers	Heart of the multicultural project, is an assumption of a multi-ethnic world in which many peoples can live together in harmony
Ford 2014	C	Multicultural Diversity	Multi-cultural management process is an art which combines project management knowledge, skills, techniques and multicultural ability in order to create a unique product, and meet the project requirements
	C	Poor Communications	Project manager should use the communications management plan, a part of the project management plan, as a tool for effective and efficiently communication between stakeholders
Murphy & Dillon 2010	C	Weak Knowledge information and Educated Personnel	Multi-cultural principles to be aware of ethnic, gender, and cultural heritage; to acquire knowledge about the clients' cultures; to use self-awareness and knowledge to devise flexible strategies
Abouellil 2011	C	Low availability of skilled workers within the Country	Human element is a determining factor for the degree of progress in any community
Bashkarev 2015	C	Poor Data Base	HR departments have moved from primitive records management, including document processing and staff registration to tackling strategic tasks
Rasmussen & Jeppesen 2006	C	Low Job Satisfaction	Teamwork have been related to report higher job satisfaction
Blass 2007	C	Low Talents and Suitable Workforce	Talent management in HR planning requires many different processes such as starting to identify, select, then develop and most importantly retaining the talented ones in any successful organization

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Table 2 continued

Tajuddina et al. 2015	C	Poor Analysing of Project Management Situations	Many analysts are encouraged to offer and improve talent management problem models as this may assist as an advantage for HR planning
Araoz et. al., 2012	C	No Sufficient Qualified Workers	15% of United States, Asian, and below 30% in European companies, declare that they have sufficient qualified workers and don't have a problem with succession in key positions.
Vaiman et al. 2012	C	No Talent Management	In business firms Talent Management is a tactical tool that can be used to achieve sustainable competitive advantages
Tarique & Schuler 2010	C	Low Individual Skills	Firms must increase the individual's skills and abilities
FMI talent development survey 2015	C	Shortage of Skilled Work Force	According to Facilities Management Institute's (FMI) talent development survey (2015) 86% of companies have witnessed skilled labor shortages due to facing many difficulties in identifying their required talents.

#### 4.2. Egyptian Perspective Review in Identification of HR Challenges & Opportunities

Egyptian Researchers efforts in identifying human resource challenges and opportunities in Egypt have been highlighted and analyzed in Table 3. The Opportunities conducted includes, Improvement in meeting rise in population demands, capability of reducing the Egyptian workforce rate, Improving Egyptian human resource technical skills, design, and construction qualifications. This achievement can only be maintained through successful collaboration between the Egyptian construction authorities and organizations working within the industry of smart cities development. Challenges explored by the Egyptian researchers included, gender diversity.

National researcher's reviews studied both human resources challenges and opportunities throughout several studies which totally focused on the Egyptian Context. In the light of identifying Egypt's researches preview towards maintaining successful smart development, Human resources factors which can enhance the successful developments of SDP are gathered forming a set of external and internal human resource factors. Table 3 indicates a list of challenges and opportunities including benefits gained by reducing the unemployment rate, increasing Egypt's innovation and technological aspects, urbanization solution. Challenges include flexible policies, transparency with organizations, implementing supportive gender diversity employment standards to make use of available skills.

Table 3. Recognized Researches Opportunities by Local Authors, authors after extant literature

Author	HR Category	HR Factor	Description
Handousa 2010	O	Solution for Urbanisation Problem	The Author described a methodology based on the concept of smart city and its various applications in Egypt. The Author realized external opportunity through the shift to smart construction is said to solve Egypt's urbanisation problem. The Author further explore planned smart cities which ended up in achieving a categoric smart development. This includes the cities of EL-Rehab and Madinaty smart infrastructure helped in developing smart social and environmental communities.
	C	Lack of Smart Knowledge & Techniques	Vision, objectives, plans (strategic or action), decision making practices, are all central and city is entirely run by the owner company. Madinaty can be considered as on the correct path in developing into a digital city. However, technical smartness as described/defined of smart is still in its birth phase.
El Badawy 2014	C	No Governmental Coordination	Lack of coordination between the different ministries that run Technical training schools in Egypt
World Bank Report 2016	O	Solving Population Problem	To date 43% of the population in Egypt live in 223 cities, of which 56 % are concentrated in the Greater Cairo Region (GCR) and Alexandria. This rapid urbanization represents one of the biggest challenges that faces Egypt's urban development and is one of the main causes of the growth of informal and unsafe areas in Egypt.
Capmus 2015	O	Providing more Job Opportunities	A key aspect of the stunted transition in Egypt is the problem of unemployment. Its rate continues to climb and youth between the ages of 15 and 29 are increasingly the most affected. The official unemployment rate currently stands at 12.8 percent, and in the youth bracket it reaches 30 percent
	O	Gender Diversity	The official unemployment rate stands at approximately 12.8 percent, and in the youth bracket it reaches 30 percent. Young women unemployment rate reaches 49.8 percent.
DeAnne et al. 2012	C		A study ranked Egypt 129 out of 142 countries in workplace inequality. It was estimated that raising the workforce participation rate of women to equal men could raise the Egypt's GDP per capita by an incredible 34 percent
Adel 2016	C		Human resource diversity comes in the form of either gender, age, or even culture. In Egypt, the gender diversity is clear in the figures of unemployment of women. Smart cities require employment of personnel with high technical skills which might be available in both genders.
Amid East ILO	O	Making use of Available Skilled Employees	The recently commissioned women at work initiative funded by the ILO seeks to provide 200 unemployed women aged 21 to 26 with appropriate skills that will enhance their job prospects and entry into the workforce

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Table 3 continued

Egyptian Strategy 2030	O	Improving Countries Innovation	Technology of work force, The Egyptian Companies Innovation Capacity Index presenting their skills in using research to achieve their goals from year 2014 to year 2030. Egyptian companies were ranked to be 132th in 2014 and is said to be 60th by year 2030 only if research and innovation was more involved in the construction process.
ESCWA	O	Available HR	A Smart City is one that manages such development by excelling in multiple key sectors; economy, mobility, environment, people, living, and government. This can be achieved through strong human resource, social capital, and/or ICT infrastructure
El Badawy et al		Flexible Government Systems	Attributed to the institutional setup in the country, and the inability of the system to respond to the changes in this institutional setup.
ILO Egypt Report February		Supportive Policy	Policy makers in Developing countries are in a persistent need for outlining a clear multilevel highly collaborative strategy for HR development which would provide the infrastructure on which a sustainable economic policy can be set. This policy would ensure consistent long-term growth and prosperity

## 5. Challenges & Opportunities based on Developed Countries Case Studies

Due to the scarcity of SDP in Egypt, the authors of this paper performed an analysis of the SDP case studies in developed countries, aiming at extracting lessons learned and comparing the existing HR factors in such projects to what is to be expected in Egypt.

### 5.1. Challenges of Human Resources in Design and building of SDP

The design and building of SDP faces different human resource challenges which can greatly impact their successful delivery. One of the crucial factors which practically influence the economic situation of a country is the HR development. HR development has recently been a major priority, if not an obsession for leaders and policymakers in the developing new smart countries (El Badawy et al., 2014). The development of human resource is characterized by different implications regarding their external and internal environment. The relation between external environment and the human resource development ensures the institutional setup of the country for improvement of organizations successful engagement in design and building of new cities. The aim of this review is to recognize and classify HR challenges based on both internal and external environment of an organization. Table 4 summarizes HR challenges classified into either internal or external challenges towards the design and building of SDP in developing countries. The Table indicates the author name, publish date, country, classification of challenge, and a brief description of the HR challenge are presented. At the end of the table, the number by which the challenge is repeated all-over the study of developed and developing countries is indicated. Case studies in table 4 includes: Smart City of Wein, Waterfront Toronto, Smart City of Atalanta, European SDP, China Yinchuan Smart City, and Dubai SDP.

Table 4. Human Resources Internal and External Challenges (Homeier, 2016; Ning, 2016; Helfert, 2015; PMI, 2013; Smart Dubai, 2014)

(HR) Challenges in SDP	Code	No.
Flexibility of Policy Makers	C E	2
Unoptimized Use of Natural Resources	C E	1
Optimum integration of Resources	C I	1
Interaction with Talented Work Force	C I	1
Decentralized Work Sites	C I	1
Formal and informal Governments	C I	1
Economic Decline	C I	1
Mono sectoral Economy	C E	1
Safety and Security	C I	2
Lack of Smart City Data Base	C I	2
Multicultural Diversity	C I	1
Talent Gap inside Organizations	C I	3

### 5.2. Opportunities of Human Resources in Design and building of SDP in Developed Countries

Despite there are noticeable HR challenges within the design and building of SDP, but opportunities are noticed as well. HR opportunities are classified into either external or internal environment opportunities. HR internal opportunities are those opportunities which its benefit return on work force working within stakeholder’s organizations. These stakeholders are responsible for the design and building process for SDP. On the other hand, external opportunities represent benefits gained by countries in implementing the design and building of SDP. Table 5 summarizes HR opportunities classified into either internal opportunities or external opportunities towards the design and building of SDP. The table presents the author name, publishing date, country, opportunities classification, and a brief description of the human resource opportunity.

Table 5. Human Resources Internal and External Opportunities in Developed Countries (Homeier, 2016; Ning, 2016; Helfert, 2015; PMI, 2013; Smart Dubai, 2014)

(HR) Opportunities	Code	Repeated Opportunity /Case Study
Improve Countries use of Technology	O E	2
Providing More Job Opportunities	O E	2
Shrinking Cities	O E	1
Organizational Intelligence Level	O I	1
Good Governance	O I	1
Solution to High Population	O E	1
Improving Employee Skills	O I	1
Flexible Financial Stability	O I	1
Smarter Working Environment	O I	1

### 5.3. Analysis of Case Studies for Development of Smart Projects in Developed Countries

The following review describes ten different cities working on building or developing their cities to be new SDP. The review aims in recognizing human resource key Opportunities and Challenges arising from the internal and external stakeholder’s environments. Table 6 presents different developed countries considered from different contexts in order to be able to highlight both challenges and opportunities in more details. Case studies selection is based on specific criteria’s including: scale, budget and its geographical location. Case Studies selected represent countries from developed countries. Egypt is said to benefit from the international case studies highlighted through

different researchers reports and studies. As shown in Table 6, each of the researcher, year of publish, case studies Titles, Photos, are illustrated. Furthermore, the previously conducted HR challenges and opportunities from these case studies will be structured and categorized.

Table 6. Analysis of International Case Studies for SDP

Case Studies	Background	HR Factors
SDP Built in the Mediterranean Region, Helfert (2015)	Highlighted through a three-year research developed by the Universidad Politecnica of Madrid (UPM).	<ul style="list-style-type: none"> <li>-Government Flexibility</li> <li>-Supportive Governmental Policies</li> <li>-Rapid demographic changes</li> <li>-Technological Aspects</li> <li>-Economic Changes</li> </ul>
The Smart City of Wien, Homeier (2016)	Vienna Strategy to be a Smart City on 2050. The development of the strategy begun in 2013.	<ul style="list-style-type: none"> <li>-Policy Makers Flexibility</li> <li>-Optimum Utilization of Existing Plans</li> <li>-Resource Scarcity</li> <li>-Increase in Innovation</li> <li>-Provides Employment</li> <li>-Can be base of future smart applications</li> </ul>
Smart City of Toronto, Ning et al (2016)	The smart city is built on six pillars: Broadband, Knowledge workforce, Innovation, Digital equality, Sustainability and Advocacy	<ul style="list-style-type: none"> <li>-Providing Jobs</li> <li>-Affordable Smart Houses</li> <li>-Increase of Innovation</li> <li>-Improvement Employees technical skills.</li> </ul>
China Yinchuan Smart City, Ning et al (2016)	IT will shift to cloud architectures: construction of infrastructure, platform and software will be introduced with a cost of more than \$150 billion by 2020	<ul style="list-style-type: none"> <li>-Improving Communications</li> <li>-Enhancing Use of Technology</li> <li>-More accessible work place</li> <li>-Supportive Government</li> <li>-Sharing Big data</li> <li>-Available data base</li> </ul>
Atlanta Smart City, Ning et al (2016)	New vision for Atlanta to become the transportation city of the future.	<ul style="list-style-type: none"> <li>-Cooperative working environment</li> <li>-Available workforce</li> <li>-Solve Population Problem</li> <li>-Provides Jobs</li> <li>-Fostering the Growth of the Economy</li> <li>-Improve mobility, public safety</li> <li>-Provides HR with smart construction experience</li> <li>-Meet Sustainable Goals.</li> </ul>
Smart City of Catalonia Ning et al (2016)	Based on the European Union goals for 2020. Goals seeks improving data sharing capabilities between citizens.	<ul style="list-style-type: none"> <li>-Improving HR technology and knowledge</li> <li>-Enhancing communications between HR workers</li> <li>-Empowering innovation and big data storage</li> </ul>

*Continued on next page*

Table 6 continued

Development of Dubai as an Innovative Smart City, KPMG (2015)	The project aims to achieve six 'smart' focus areas: smart life, smart transportation, smart society, smart economy, smart governance and smart environment.	-Increase Countries Innovative skills -Cultural Diversity -Need to Improve HR Performance -Gender Diversity -Smart will improve technical HR skills -Centralized Workforce
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#### 5.4. Application of Risk Break Down Structure on Case Studies

The classification of Case Studies challenges and opportunities using Risk Break Down Structure Technique (RBS) is represented in table 7. These success factors are a combination of the analysis including both different SDP case studies and stakeholders obtained from the previous cases. The main target of this analysis is to identify, highlight, analyses and further investigate both challenges and opportunities for each case study and categories them accurately. Table 7 below is considered to be a deep focus on human resource success factors regarding different contexts in the light of the review of developed SDP case studies.

Table 7. A Review for the Role of (HR) in Design and building of SDP in developed countries

Developed Countries	
Smart City of Wien, Smart City of Toronto, China Yinchuan Smart City, Smart City of Atalanta, Dubai,	
Smart City human resource Challenges and Opportunities	Role of human resource in the Design and building Industry
HR Challenges	
Flexibility of Policy Makers	CE2
Unoptimized Use of Resources	CI7, CI1 & CE1
Needs of Talented Work Force	CI1
Lack of Smart City Data Base	CE3
Decentralized Work Sites	CI6
Multicultural Diversity	CI3
Safer Environment	CI5
HR Opportunities	
Improve Quality and use of Technology	OE6
Good Governance System	OE4
Raising Organizational Level of Innovation and Intelligence	OI2 & OI5
Improving Countries HR Skills	OE1 & OI1
Providing More Job Opportunities	OE3
Solution to High Population	OE2
Improving Employee Technical Skills	OI1 & OI2
Country Flexible Financial Working Conditions	OE5
Providing Smarter Working and Living Environment	OI2 & OE6

#### 5.5. Key HR Challenges and Opportunities of SDP

As shown in Figure 1, human resources challenges are analyzed from International countries case studies. The most challenging factor for HR in design and building of SDP in developed countries is the internal challenge 'availability of suitable work force' (CI1). Followed by internal challenges 'globalization and multicultural diver-

sity' (CI3), 'suitable human resource safety' (CI5), 'decentralized working sites' (CI6), 'employee involvement' (CI7) and external challenges 'available human resource in a country' (CE1), 'flexibility of policy makers' (CE2), and 'lack of SDP database' (CE3).

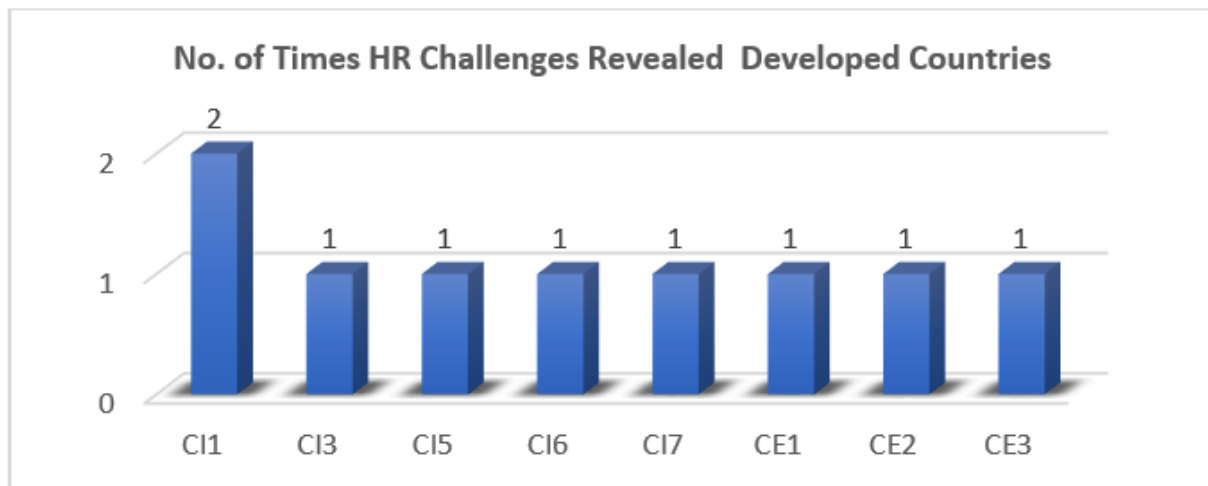


Figure 1. Human Resources Challenges for Developed Countries

## 6. Conclusion

The main aim of this paper was to identify key HR Opportunities and Challenges arising from the internal and external stakeholder's environments, which can impact the success of delivery of design and building of SDP. The factors were studied for International case studies highlighted mainly from developed countries with an emphasis on the case of Egypt. By the end of the paper a complete risk breakdown structure was obtained including key HR challenges and opportunities. The identified factors can then be successfully lamented into the development of Egyptian smart cities. Thus, the paper adds knowledge value in HR project management concerned with building new smart projects.

The paper recognized HR factors which acts as threats or an opportunity towards the successful delivery of smart city projects. The identified human resource factors resulted from interaction between both the literature of HR Challenges and Opportunities and Practical application approaches. The practical approach was conducted by navigating through different developed countries case studies. Thus, obtaining a strongly related HR Challenges and Opportunities which is closer to the Egyptian context. Furthermore, a detailed risk breaks down structure was obtained in the benefit of SDP in Egypt. This was categorized into internal stake holder's environment and external enterprise project environment.

Based on this paper, HR involved in the design and building of SDP has a critical role in improving the economic situation for countries. By building and developing SDP in Egypt, more opportunities will be offered to different HR engaged in the design and building, and thus improving the country's GDP. Thus, Egypt can have the opportunity to have more stable economy, attract more external investments, and improve technological skills within available HR.

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