

Dubai, a disability friendly city in the making
An investigative study

دبي ، مدينة صديقة للإعاقة
دراسة استقصائية

by

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Dissertation submitted in fulfilment
of the requirements for the degree of
MSc SUSTAINABLE DESIGN OF THE BUILT ENVIRONMENT
at
The British University in Dubai

September 2016

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Abstract

Dubai claims that by 2020 it will be a people with disability friendly city. It was important to examine the following aspects; first the extent to which the city serves people with disability at this crucial stage, second the way Dubai's current built environment is serving people with disability and finally codes and regulations and how they reflect on Dubai development plans. The aim of this research is to bridge the gap in an area that is much needed specifically in the presence of such a pioneering initiative that is referred to as "my community". Pursuing the achievement of this study's aims, a set of mixed research methods are used including semi structured interviews, observations of some of the current and plans of future built environment projects, as well as detailed data analysis of Dubai building codes and regulations. The study discusses several obstacles that were encountered during the period of the research, moreover a series of limitations that were associated with subject study. The findings showed a clear gap in what is currently offered for people with disability in such vibrant city and what is expected to be achieved by 2020, furthermore the study showed issues with alignment of local, federal and international codes and regulations. A set of recommendations for future practice are offered to help fellow designers, planers, stake holders and decision makers to support such category of society to fully function independently.

Key words: Dubai, disability, Accessibility, social sustainability, UNCRPWD, Universal Design, built environment, building codes

نبذة مختصرة

في خضم سعي دبي لأن تصبح مدينة صديقة للإعاقة بحلول عام 2020. كان من المهم دراسة الجوانب التالية ؛ أولاً ، إلى أي مدى توفر المدينة الخدمات المطلوبة للأشخاص ذوي الإعاقة في هذه المرحلة الحرجة ، وثانياً ، مدى استعداد البيئة العمرانية الحالية في دبي لخدمة الأشخاص ذوي الإعاقة وأخيراً مدى قدرة القوانين والأنظمة الحالية وتأثيرها على خطط دبي التنموية في هذا المجال. الهدف من هذا البحث هو سد الفجوة في مجال مطلوب بشكل خاص في وجود مثل هذه المبادرة الرائدة التي يشار إليها باسم "مجتمعي". في إطار تحقيق أهداف هذه الدراسة ، يستخدم الباحث مجموعه من أساليب البحث المختلطة منها المقابلات شبه المنظمة ، وملاحظات عن بعض المشاريع الحالية والمستقبلية ، بالإضافة إلى تحليل البيانات التفصيلي لقوانين ولوائح المباني في دبي. تناقش الدراسة العديد من العقبات التي تمت مواجهتها خلال فترة البحث ، بالإضافة إلى سلسلة من القيود التي ارتبطت بموضوع الدراسة. وأظهرت النتائج وجود فجوة واضحة بين الخدمات المتوفرة حالياً للأشخاص ذوي الإعاقة في هذه المدينة النابضة بالحياة وما ينتظر تحقيقه بحلول عام 2020 ، علاوة على ذلك ، أظهرت الدراسة مشكلات تتعلق بتناغم القوانين واللوائح المحلية والاتحادية والدولية في موضوع البحث. تقدم الدراسة مجموعة من التوصيات للزملاء من المصممين والمخططين وأصحاب المصلحة وصانعي القرار للمساعدة في الممارسات المستقبلية و دعم هذه الفئة من المجتمع للعمل بشكل مستقل بشكل مستقل.

الكلمات المفتاحية: دبي ، الإعاقة ، سهولة الوصول ، الاستدامة الاجتماعية ، UNCRPWD ، التصميم العالمي ، البيئة المبنية ، قوانين البناء 7

Acknowledgment

I would like to thank everyone who contributed in some way in this work of master thesis.

First and foremost, I'd like to express my sincere gratitude to my advisor Professor Haşim Altan for the useful guidance, continuous support, motivation, and immense knowledge during the development of the ideas in this thesis.

Beside my advisor, I would like to thank Professor Eman Gad for her encouragement and support through the whole learning process of this dissertation.

Also, I like to thank all the interviewees for their generosity in spending their time willingly to share their views and insights on my topic during the process of interviewing.

Last but not least, I'd like to express from my deep heart my love and the debt of gratitude I owe to my beloved family; my Dad for his wisdom and enthusiasm, my Mom for her unlimited care and love, my wife for her unyielding support, patience and care. Finally my beloved son, brother and sisters who have always been there for me, supported my dreams and aspirations. I'd like to thank them all for all what they have done for me.

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1 CHAPTER 1: INTRODUCTION

1.1 RESEARCH BACKGROUND AND RATIONAL

Federal Law no. (29) of the Year 2006 of the United Arab Emirates for Special Needs Rights, Defined a person with Special needs as *“any person affected with total or partial disability or disorder, permanent or temporary, in his physical, sensing, mental, communicative, educational or psychological abilities to the extent that reduces the capability of fulfilling his ordinary needs in parity of ordinary people.”*

UAE ratified the UNCRPWD in 2009 and is internationally committed to, apply amendment to the existing infrastructure and codes in order to include people with disability in all aspects of life.

A cohesive society that is socially sustainable is not to be achieved or completed unless all persons in this society not only are treated as equals but are actively participating in all aspects of life. The current interest of UAE’s federal government and the local authorities in Dubai, it’s essential that such interest is to reflect the concept of inclusivity in Dubai’s built environment through its infrastructure, codes and regulations.

Moreover, there is an international call for a drastic reassessment of sustainable buildings design: without built in accessibility for all. Buildings will require periodic retrofitting and are therefore not sustainable, as well as the subject buildings are missing on one of the most aspects of social sustainability which is equality.”

The researcher observations of people with disability while carrying out there every day activities, the obstacles they face and what could be achieved in order to facilitate is what inspired this research to investigate further accessibility of Dubai built environment.

This topic is critical for practitioners from various professional backgrounds such as: healthcare, age care, architects and urban

planners, that is because in the words of Daniel Libeskind “Good Design should be for everyone”. (Sawyer, 2007)

Human beings appreciate and interact with nature and built environment using their senses, for those who can't it's the society's duty to enhance their interaction with the environment around them, and facilitate the obstacles that may prevent them from functioning at least in human created environment that we create as architects. The aim of this research is to bridge a gap in an area that is much needed specifically here in Dubai as its working on 'my community' initiative. Also it aims to explore the challenges that face both the designers and the decision makers on their quest to achieve Dubai's vision of a built environment for all. The study is mainly focused on the special needs of PWD, codes, regulations and how to employ them to achieve the goal of making Dubai the most disability friendly city by 2020.

1.2 Aim

The aim of this study is to:

- Explore the challenges that faces the designers on their quest to achieve Dubai vision.
- Explore the obstacles that face PWD in carrying on their daily life activities. This happens through the following objectives:
 1. Explore the needs of PWD.
 2. Examine the codes of practice, their applicability and effectiveness.
 3. Explore ways of effectively implementing the codes.

1.3 RESEARCH QUESTIONS

This investigative study on Dubai intended goal of being the most disability friendly city by 2020 the current status, barriers and issues related to achieving this goal, would look at answering the following research questions:

- To what extent the Dubai built environment codes and regulations are reflecting the achievement of Dubai goals to be a disability friendly city by the year 2020?
- What are the views of people with disabilities living in Dubai on the accessibility of the built environment?
- What are the views of architectural designers working in Dubai on the accessibility regulations and standards of Dubai built environment?

1.4 RESEARCH LIMITATIONS AND OBSTACLES

The study focused on Dubai only, in a time that is considered to be a transition period in relation to services offered to people with disabilities. That is due to the huge initiative lead by a higher comity that is formed from almost every head of governmental agencies in Dubai to insure serious execution of making Dubai a disability friendly city by 2020.

The sample size of interviewed PWD could be argued also this was argued earlier, it is worth mention that the categories offered in the study is considered as a good representation of PWD

Moreover there were a number of challenges associated with this study, some of which were expected as the nature of the subject was rather new and a research topic as it was considered to be original however when it came to implementation of the study a number of challenges faced the researcher.

The categories of disabilities that the research dealt with can be argued to cover most of the needs of a wide range of disabilities when it comes to physical built environment since among the interviewed were wheelchair users, People with vision, hearing & intellectual impairments. Originally the researcher wanted a representation from all the categories of disabilities that are mentioned in the WHO classification (WHO, 1980) however after long consideration and consulting an expert in the area of disability the researcher rested his mind on four main categories as representative of people with disabilities. People with visual impairments, serpalpalcy/intellectual

disabilities, and a wheel chair user were all interviewed as part of this study. Which was discussed fairly in the literature review.

Physical access to location to assess accessibility in order to get the most of the site observations throughout all the location time cycle monitoring fixed, moving and temporary obstacles in different times of a day, field visits were designed to highlight any observed physical obstacles that may exist and verify the claims of people with disabilities.

Present time in Dubai life as a transition time between practice and execution can be considered on one hand it's an exciting time for researchers, but on the other hand raises questions like whether it be valid, or will it actually help decision makers?

Narrowing down the research questions and interviews originally the research was looking at seeking views of many participants that are involved in the issue, as the research developed and the data sought from the concerned participants were rich in nature, the researcher, in the interest of a good focus, decided to concentrate on people with disabilities and there construction of what is on offer in terms of accessibility in the places they are most likely to approach.

1.5 ORGANIZATION OF CHAPTERS

This dissertation have been exhibited in five primary chapters followed by the references, bibliography that helped form the research in a general way but have not been quoted in, and appendices. Chapter one presents an introduction to disability, efforts exempt by the United Arab Emirates on special needs rights, and finally aims and purposes of the research. Moreover it raises the research questions that this study aims to answer. In chapter two the researcher presents the research methodology utilized and elaborates on reliability and validity issues. Chapter three previews the literature review of sources, reports and references concerning Persons with disability, Universal Design, accessibility, regulations and initiatives, disability friendly cities, initiatives taken by Dubai towards the

goal of being the most disability friendly city by 2020. In chapter four the researcher layout the findings and analysis of the data collected from: field observations, interviews, other disability friendly cities action plans, regulations as well as Universal design principles analysis. Finally in chapter five the researcher sum up the conclusions of the study through findings discussion, took after towards recommendations then proposed venues of future research. Followed by lists of used references and bibliography that was encountered and help shaping the dissertation in general as well as appendices.

1.6 SUMMARY OF THE CHAPTER

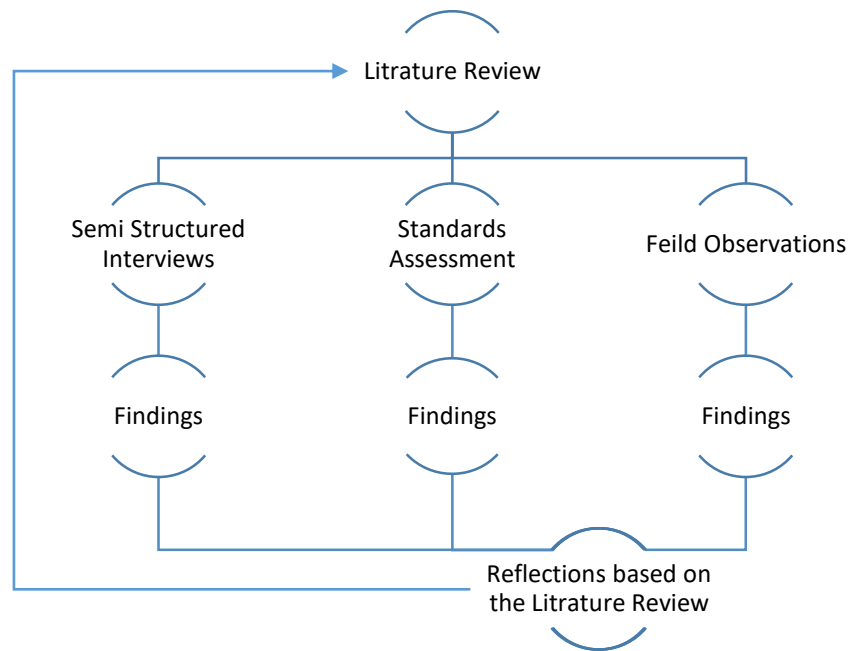
In this chapter the researcher covered an introduction to the topic and presented the research questions as well as the rational and significance of the research in the following chapter the researcher will cover the used methodology to answer the research question, and issues related to such methods that include limitations, ethics, and time frame.

2 CHAPTER 2: METHODOLOGY

2.1 THE METHODOLOGY RATIONAL.

The Researcher approached this research problem using mixed methods approach since it would provide a more robust as well as holistic picture of what Dubai is able to offer to PWD. Triangulating on the problem measures, reaching recommendations of how to aid designers and decision makers in to achieve the goal of making Dubai the most disability friendly city by 2020. The Journal of Mixed Methods (2006), defined mixed research methods as *'research in which the investigator collects, analyses, mixes, and draws inferences from both quantitative and qualitative data in a single study or a program of inquiry'*. (Denzin, 1978). Favoring the use of mixed methods, highlighting that by using mixed research methods, *"the bias inherent in any particular data source, investigators, and particularly method will be canceled out when used in conjunction with other data sources, investigators, and methods"*. Denzn stated that the even though the outcomes of triangulation are not uniform, irregular, and conflicting, which ever may prevail, superior explanations can be constructed by the researcher of the subject research problem. Also (Jick Todd, 1979) agreed concluding triangulation advantages as confident results creativity and stimulated data collection techniques leading to more robust t data that helps uncover contradictions and uncover gaps that were unclear due to isolation of sources. On other hands the criteria that established the appropriateness of choosing this approach is that this research is investigating a problem that requires exploring different disciplines including; achieving social sustainability, people with disabilities needs from one side and decision makers and designers as well as codes and regulations deficiencies that acts as obstacles of achieving the goal of making Dubai the most disability friendly built environment by 2020.

Figure 1 Triangulation Process (by Author)



2.2 METHODS USED

This research employs a multi-method approach, the greater part of which produce qualitative data. The researcher gathered information from semi-structured interviews, field based observations and standards & codes analysis. (Pugach, 2001) States that these three methods of data collection provide *“multiple data sources for telling of disciplined stories which are products of systematic planning and careful hours and months and years in the field which is often the grist for profound insights about individuals or situations at hand.”* This data triangulation would enhance the rigor of this small-scale research and would hence help encounter any threats to validity. The methods used in this study are discussed below.

2.2.1 Semi-structured Interviews.

A semi structured interview is a method of inquiry that is a set of open ended questions that open possibilities for open answers. That is suitable for understanding the interviewees' opinions, allowing them to express their thoughts. Which in turn enabled the researcher to gather data on the community of people with disabilities, there culture, there everyday life, how they function, what are the obstacles they are facing in daily bases, and what they imagine the world should be like.

The study involves the use of semi structured interviews of people with disabilities; ranging from visually-impaired, hearing-impaired, wheelchair users, mental impairments, walking difficulty, reduced strength. All of which are recognized disabilities as per the UN classification, live in Dubai, and are adults above 18 within an age range between 19 to 40 years old. Other participants are three professional architecture designers. All of which are certified designer architects by Dubai municipality. They live and work in Dubai, and are adults above 18 within an age range between 28 to 40 years old. The questions were pertaining to the everyday use of the built environment, the experiences on the accessibility of Dubai built-environment and ways to enhance such environment to support the functionality of people with disability.

2.2.2 Document Analysis

The second method in the pursuit of triangulation process was document analysis. The analysis of standards, codes and regulations can be a powerful tool in order to identify the gaps in the subject guideline, on the journey of improving it. primarily, a document or data is not limited to books, newspapers, reports or conference proceedings however the term data can very much be extended to include non-written sources like interviews, pictures, diagrams, illustrations or photos. The data that was subject to the researcher analysis were municipality building codes, governmental regulations, association's publications, international building standards, countries & unions disability reports and action plans. The researcher also went through regional disability action plans, newspapers with articles on governmental initiatives that is related to disability and disability friendly communities in details. The researcher included in the data analysis multimedia sources like websites, united nation publications, newspaper articles and governmental portals.

A spreadsheet was developed using a list of disciplines and elements of the built environment that was derived from a report on accessibility

of built environment that used by the EU to access the codes and regulations in the European countries and how sufficient, and full filling are they in line with the international standards **ISO/FDIS21542**. **ISO/FDIS 21542** was created by the input of 28 countries worldwide that is considered to represent a wide range of acceptance and understanding of disability and accessibility, and what is to be considered of the best practice in terms of accessibility of built environment. (CEN, 2011)

2.2.3 Field observations

The third and final method to complete triangulation was field observations. Observation has been a significant research tool throughout history of mankind, leading some of the most important science discoveries. (Discoll, 2011). A research tool that is compatible with almost any subject matter, depending on the subject researcher method and research questions.

In order to triangulate and validate the collected data two samples of relatively new developments were selected. Based on expecting that the plan of Dubai becoming an accessible city by 2020 were taken into consideration from the design stage to the execution stage of such projects.

Moreover the selection took into consideration the findings from the interviews conducted with persons with disabilities regarding the most visited places in their daily life activities.

The researcher conducted several site visits to two of Dubai relatively new public developments that were constructed over the past 3 years, Dubai City Walk and Dubai Galleria Mall. Observation and assessment of both attractions was done under the light of the previously used disciplines of the European Union built environment accessibility report. (CEN, 2011)

2.3 METHODOLOGICAL ISSUES

2.3.1 Validation (triangulation)

The researcher raised several questions:

To what extent is this research to be considered a good interpretation to reality?

Do the interviews represent all categories of people with disabilities?

To what extent the data gathered would be of benefit to decision makers in Dubai and elsewhere at such a crucial time.

Will the research be valid 10 years from now?

In an attempt to answer those questions one could argue that the authenticity of the study in such a crucial time although may be argued not to be hugely significant on the other hand, it may pave the way to other fellow researchers to look into such areas, that touches the lives of variable people in the community

Triangulation was used to support the validity of the data. As it relies on multiple sources of evidence. (creswell, 2009).

2.3.2 Ethical considerations

The researcher paid a lot of attention to the ethical considerations. He was well aware of the vulnerability of the target group and the need to insure that ethics of research comes first.

All ethical procedures were followed as per BUiD ethics guidelines. Participants were given the option of not sharing the information in the finding section and clear explanation of the purpose of the study was presented with full transparency to avoid any compromise of the work validity. This is in addition to withholding the names and identity of all participants who took part in this study, the researcher used initials only to protect the identity of those who took part in the study.

2.4 INTERVIEW QUESTIONS

2.4.1 PWD:

1. Are you happy with Dubai built environment accessibility?
2. Justify?
3. What kind of buildings do you deal with in your daily life?
4. Are there physical barriers that prevent you from functioning normally throughout your day?
5. What are those physical barriers?
6. What do you think can be done to help improve the built environment accessibility?

2.4.2 Designers:

1. Are you happy with Dubai built environment accessibility? (Can you put it on a scale from 1 to 10 (1 is disappointed, 10 is very happy)).
2. Justify?
3. Are you familiar with Universal design principles?
4. Have you ever implemented them in projects in UAE?
5. Are you familiar with DM code accessibility regulations?
6. Do you think building DM accessibility regulations are easy to implement in building design?
7. What are the challenges and obstacles that a designer may face in implementing DM accessibility regulations?
8. What do you think can be done in order to improve building accessibility in Dubai?

2.5 SUMMARY OF CHAPTER

In this chapter, the researcher presented the research methodology utilized. He referred to the multi methods approaches used in his thesis. He gathered information from semi-structured interviews, field based observations and document analysis. In addition, he included some of the challenges he faced, associated with this study ranging from working on a new research topic, to time management, to reaching people with disabilities. In the remaining sections of this chapter, the researcher

elaborates on reliability, ethical considerations and validity issues. The researcher ended chapter 2 with the interview questions for both target groups; designers and PWD. In the following chapter, the researcher will preview the literature review.

3 CHAPTER 3: LITERATURE REVIEW

In 1971, His Highness Sheikh Zayed bin Sultan Al Nahyan turned seven small emirates into a federation which intern is the only federation in the Arab world. (Goverment, 2016) UAE's main natural resource and countries main income is oil wealth that was the main pillar of development of the UAE's economy to become one of the world fastest most successful growing economies.

The UAE consists of seven emirates: Abu Dhabi, Dubai, Sharjah, Ras Al Khaimah, Ajman, Umm Al Quwain and Fujairah. Bordered by the Arabian Gulf from the north, the Gulf of Oman from the east, KSA and Oman to the south while bordered by Qatar and KSA from the west.

Most of UAE landscapes are deserts, although small in size 83,600 Sq. km, with an overall population of 8.19 million, 16.5 % Nationals (Federal Competiveness And Statistics, 2015), with Dubai as its most populated city.

Dubai is located almost at sea-level (16 m above) on the Eastern coast line of the Arabian Peninsula. The Emirate shares borders with Abu Dhabi, Sharjah and Oman.

While being the second largest Emirate with an area of 4,114 sq. km. (Goverment, 2016) , and a population estimated at 2.3 million as of 2014, Dubai has managed to reserve a front row spot in the world's fastest developing cities; Moreover winning Expo 2020 helped placing Dubai more under the spotlights of the whole world with its ambitious plans for a better future.

UAE has a long interest in developing the lives of people with disabilities, started by issuing the first law in 1981 to include learners with disabilities in mainstream schools. In fact, that is relatively older than most of GCC countries when it comes to inclusion of learners with disability in the main stream system. The ministry of social affairs (MOSA) currently known as ministry of social development was the sole responsible for the quality of lives of PWD in UAE. It caters for them financially and facilitates the services that a person with disability demands in order to be able to carry out his/her daily activities. The UAE was among the first countries in the region to sign the UNCRPWD

following the signature in 2007, UAE issued a federal law, which was considered a breakthrough in the improvement of the lives of PWD. This law is known as the Federal Law # 29/ 2006. However, the law wasn't active until recently for several reasons. One is due to the vague name of the law for a category known as people with special needs (Gad, 2011). Therefore, following a call for change in the federal law, an amendment of such law was issued, known as Federal Law #14/2009. It's a federal law on the rights of people with disability. From this date, people with disabilities started to seek their rights in all aspects of life including health employment and education, resulting in accessibility becoming a major aspect and tool, essential to empower such regulations. (es, 2011)

On a local level each emirate is taking its own initiative to apply the federal law, while the emirate of Abu-Dhabi focused clearly on the aspect of inclusion in schools through ADEC (ADEC, 2016), while Sharjah used its long established Sharjah humanitarian city lead by sister of the ruler H.H. sheikh Jamila al kasemy to support the agencies that offered services for people with disabilities, Dubai on another hand used a more structured approached of issuing its own local legislation known as My community.

The term person with disabilities (PWD) is given to people who have a condition that prevents him / her from everyday functions, wither permanently or temporary. (UN, 2006) modern societies and laws has set the norm that PWD are of equals rights and should be enabled equal chance in all aspects of life, which in turn means accommodating, and encouraging them to their maximum potential. (UN, 2006) With all the rights to participate in all activities, without impediments. Disability can either be physical or mental; physical disability means the loss of a body function, wither partially, totally, permanently or temporarily. Including sensory disabilities, such as having hearing or vision impairments. While mental disabilities are recognized as the condition that affects the person with disability thought process, mental abilities, decision making, judgment, emotions... etc. (WHO, 2015).

According to the WHO, more than one billion people almost 15% of the world's population are living with a form of disability between 8% and 10% of which

have significant difficulties functioning. One of the main physical barriers that are preventing PWD from equally functioning is accessibility of the built environment, from inaccessible building, insufficient doorways sizes, inadequate facilities, poor signage... etc. (WHO, 2015).

PWD faces lack of accessibility to built environments from the urban fabric, housing, road networks, all the way to health, education, and transportation which implicate on the urban agenda of future cities, towns or even basic services to be more environmentally accessible, User friendly and inclusive to all human needs in other words PWD friendly cities. (UNCRPD, 2015)

Also the world health organization world report on accessibility showcase the built environment accessibility issue saying that most of our built environment and transportation systems worldwide lack accessibility for all. Lack of access to transportation is one of the main reasons PWD are encouraged to seek work or even prevent them from receiving health care. Reports from countries with well-established accessibility laws shows low level compliance, also shows that many of mass communication needs of people with disabilities is barely met in never less the lack information and data that are available in accessible formats Little information is available in accessible formats. Needless to highlight that fair percentage of people with hearing disabilities are often facing difficulties finding sign language interpretation “a survey of 93 countries found that 31 countries had no interpreting service, while 30 countries had 20 or fewer qualified interpreters” (World Health Organization, 2011).

A disability friendly city is a city that encourages inclusion of persons with disability in all activities, allowing them to actively function through there day to day life with no physical barriers. In particular terms a disability friendly city is a city that configures its infrastructure and services to be easily used and accessed by anyone and inclusive for every one regardless there sensual or physical abilities, needs and capacities.

For accessibility initiatives to succeed they need to consider affordability, competitiveness, technology and previous studies and cultural differences. Moreover initiatives should also be based on three principles: 1. Integration 2. Implementation 3. Assessment. However it should be concluded that

accessibility is easier to increment than to add. The main effort of the society have to be oriented towards building accessibility cultural awareness. Focusing on the removal of environmental obstacles and barriers. Once the accessibility awareness become ingrained more resources will become available moreover future development in such community will be of added economic value by through raising standards with higher level of universal design. (World Health Organization, World Bank, 2011).

The lack of accessibility in built environments, transportation and information systems is one of the main frequent reasons of discouraging people with disability doing there day to day functions (World Health Organization, 2011), some of many barriers that prevent people with disabilities from taking part in lots of activities and social aspects is that the society and built environment around them is not designed to help them overcome those barriers in other words, meet there requirements that specific problem was attempted to be tackled by EU under Tomar resolution in 2001 adopting Universal design as a strategy design in general and that of the built environment in particular accessible, understandable and usable to every one including people with disabilities. (Europe, 2001). Universal design is used as one of the main means in accomplishing the aims and goals of the EU Council of disability action plan 2006-2015. (ministers, 2006).

The challenge in Universal design is to incorporate the following seven principles into the mainstream thinking, planning, and design:

- Equitable: Useful for everyone disregarding their abilities.
- Flexibility in use: Usable by everyone disregarding their abilities.
- Simple use: disregarding the user background, tongue, capacity or intellectual level.
- Recognizable information: can convey the needed effectively.
- Tolerance of error: minimize hazards and accidents that may occur due to unintended incidents.
- Size and space: provide the appropriate space size that allow everyone disregarding their abilities, posture size or mobility.

A Report by Soren Ginner up, shows that many European counties have had very positive experiences implementing universal design or design for all initiatives also not full advantages of the previously mentioned initiatives has yet been taken, more over recommended that in order to make full advantage of universal design, an incentives system should apply to principle actors in different sectors, regardless public or private.

More over Soren Ginnerup highlighted that in order to get practical results the main focus should be placed on adoption and decision, co-ordination between key actors, implementation, and effective evaluation. (Ginnerup, 2009)



Figure 2 Ginnerup practical results diagram (by Author)

There are no doubts that Dubai made a clear commitment to be a disability friendly city by the year 2020 the initiative known as my community has created a lot of interest in the media. This goes in line with the UAE ratification of the UN convention on the rights of persons with disabilities known for short as UNCRPWD, the initiative includes making Dubai a disability friendly city on 5 levels, Quality health and rehabilitation services, Inclusive education, equal employment opportunities, universal accessibility and sustainable social protection system (My Community, 2016).

Since this study will focus on built environment, it's worth mentioning that Dubai government has a building code which is referred to as Dubai building codes and regulations, that has a dedicated regulation clause for people with disability putting general guidelines and compulsory disciplines to follow through the design stage classified into three building types: public buildings, investment building with area more than 5000 sq. m, Hotels (three stars and higher).

In November 2013 Dubai launched an initiative called "My community... A city for everyone" the main goal of this initiative is to unite all efforts towards the

inclusion of persons with disabilities in the community, operating in line with UAE ratification of UNCRPW and Dubai strategic plan for 2020, which take equality, tolerance and inclusion as a core for a sustainable inclusive cohesive society. (Community, 2015)

The initiative is said to tackle five main barriers health, education, employments, accessibility, and Social protection.

However this research is targeting the built environment aspect of the initiative “My Community” aims to enhance Dubai built environment’s accessibility as well as transportation information and communication systems.

My community initiative aims to achieve the set goal throughout the following process:

- Identification of Dubai regulation, guides and laws gaps against international standards of universal design.
- Identification of international best practices in the field of universal design
- The development of Dubai laws and regulations aiming to achieve a design for all.
- Put together a five-year Universal Accessibility Strategy and Action Plan (DUASAP)
- Universal Accessibility training of selected groups of professionals from both public and private sectors
- Design and implementation of six actual projects as case studies to showcase Universal Accessibility. (Community, 2015)

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Ruler of Dubai issued Law No. (2) Of 2014 to protect the rights of persons with disabilities in the Emirate of Dubai. Aiming to ensure that persons with disabilities enjoy all their rights, enhance their respect, preserve their dignity and protect them from all forms of discrimination or abuse, negligence or exploitation. (summit, 2016)

The joint research team assigned to the Dubai my community initiative have concluded phase one of the project, of which was about studying and analysis

of the current situation identifying all different sorts of gaps and obstacles that are standing against creating most accessible built environment, paving the way to achieve Dubai initiative of being the most disability friendly city by 2020.

The project is a joint venture between Dubai executive office, Community development authorities, Dubai Roads and Transport Authority (RTA), Dubai Municipality, and a number of governmental, federal as well as a number of Dubai most rebuffed developers, in addition to an intensive participation of people with disabilities and other related parties.

“The team has accomplished the goal of identifying the obstacles and gaps through a field studies, brief interviews as well as studying and analyzing different regulations. The work was split between two team, the first of which was specialized in urban environment and all the related aspects from buildings correlation, spaces, outdoor and indoor spaces, moreover the road networks, and sidewalks. Moreover this team was assigned to the analysis of a diverse sample of the built environment that included Mosques, hospitals, sport facilities, schools, residential building, public service buildings, and vital facilities of the emirate, aiming to measure the accessibility.

On the other hand the second team was assigned to the task of studying the roads and transport sector, focused on the analysis of essential dimensions needed by people with disabilities in taxi’s busses, trains as well as marine transport vehicles.” Said Youssef al Reda, RTA corporate administrative support CEO who further noted that the gap identification process was an essential step paving the way to the following phases of the project.

Mr. Al Reda concluded that on top of the identified gaps and obstacles came the lack of qualified individuals in field of accessibility and built environment in Dubai, hand in hand with the diversity and variety of different codes and accessibility regulations that are being used in Dubai, in addition to the lack of accuracy and supervision over applying the accessibility regulation on ground.

Accordingly it has been preliminary recommended to re structure the accessibility codes and regulations in all related authorities in the emirate.

CABE (the commission for architecture and built environment) the English government's advisor on architecture, in their publication by Howard Fletcher highlighted the importance of inclusive design and its role in removing the barriers and obstacles enabling everyone to participate as equals in their every day activities underlining that "Creating an inclusive place is in the hands of developers, landlords, and service providers." This publication of which set five key principles that should be implemented in any inclusive design. (Fletcher, 2006)

- Inclusive – Is a design where everybody can use with no barriers or effort and without feeling different.
- Responsive – Taking people's opinions on what they want in consideration.
- Flexible – allow different ways of usage by different ability personnel
- Convenient – a design that enables effortless use with no separation between people.
- Accommodating – A design for everyone, with no restrictions.
- Welcoming – a design that removes any barrier of which might exclude anyone from functioning.
- Realistic – a design that provides multiple solutions for multiple requirements.

An inclusive design must integrate inclusive design principles in very early stages of the design process, as delivering an inclusive environment requires consideration in addition to standards and dimensions, lighting, signs, material, furniture even audio visual components. (Littlefield, 2008)

Smith and Dropkin highlighted that "following minimum provisions of building regulations or best practice guidance alone will not deliver an inclusive environment, for this the involvement of design team, client and community are required" (Neil Smith, 2008)

An inclusive design is a realistic design that considers all people with disability needs that can't be diminished to wheelchair users alone as and according to (CEN, 2011) people with disability can be defined but not limited to:

- Wheelchair users.
- People suffering from difficulties in walking.
- People suffering from reduced strength.
- People suffering from vision impairments.
- People suffering from Hearing impairments.
- People with Intellectual or mental impairments
- People with allergies
- People with diversities in age and stature
- People with colostomy, pregnant women, mothers guiding children younger than 3 years.

On the UK journey seeking inclusive design, general guidelines of inclusive design was issued in a publication from the UK government under the name “Planning and access for disabled people” (McNulty, 2003) aiming to enhance the inclusive design performance of the built environment in UK, insuring that the inclusive environment provided is as accommodating as possible by showing how local authorities can set there planning policy as well as development control processes in the most effective manner moreover suggesting ways of which those policies can be enforced and implemented effectively. Highlighting the benefits of an inclusive built environment to both the developer and never less the occupiers pinpointing the role of each.

The McNulty report argues that that inclusive developments are more likely to have higher market value as the future occupiers are more aware of how exclusion of such a substantial portion of the population would negatively affect the economy. It also highlights the cost effectiveness of applying access to a building in the design stage, rather than implementing access on a built environment. (McNulty, 2003).

3.1 SUMMARY OF CHAPTER

In this chapter, the researcher previewed the literature review of sources, reports and references concerning Persons with disability, Universal Design, accessibility, regulations and initiatives, disability friendly cities, initiatives taken by Dubai towards the goal of being the most disability friendly city by 2020. In the following chapter, the researcher will discuss the results.

4 CHAPTER 4: RESULTS

In this chapter the researcher will present the findings of the study, results from the data collected and analyzed by the researcher via interviews, codes and regulations analysis and site observations of new Dubai projects.

4.1 CODES AND REGULATIONS ANALYSIS RESULTS

In this section the researcher will present the finding of the data analysis in the form of a spread sheet where the collected data of the UAE built environment accessibility standards, codes and regulation for both internal and external built environment was verified under to the same disciplines used by the EU accessibility of built environment report in comparison to the international standards ISO/FDIS 21542 in order to identify the gaps in Dubai building and regulation code in light of built environment accessibility.

Each discipline was given one of three criteria as following:

C: Covered (the stated code or design standards are specific with dimensions and information covering the discipline).

P: Partially covered (stated codes & standards are either limited not covering the whole discipline or not specific).

N: Not covered (The code didn't mention the discipline)

Discipline (CEN, 2011)	ISO/FDIS 21542 (CEN, 2011)	The Building Regulations & Facilities for the disabled UAE code (Works, 2010)	Dubai Codes and Regulations (Municipality, 2010)
External Environments			
Access and building Approaches	C	P	P
Ramps	C	C	P
Stairs	C	C	N

Handrails	C	P	P
External Lifts	P	N	N
Surface Finishes	P	N	N
Crossing Points and Dropped Krebs	P	C	N
Drop Off Zones	P	P	N
Car parking	C	C	P
Obstacles and Street Furniture	C	C	P
Rest areas	C	C	P
Guide Dogs facilities	C	N	N
Signage (audible)	N	N	N
Signage (tactile)	P	C	N
Signage (visual)	P	C	P
Internal Environment			
Entrances	C	C	N
Reception Areas, Counters, Desks, Ticket offices	C	C	N
Security Provisions	P	N	N
Storage Facilities	N	N	N
Circulation Routes	C	P	P
Lobbies	C	C	N
Internal doors	C	C	N
Windows	C	N	N
Passenger Lifts	C	P	P
Passenger Lifts for existing buildings	P	N	N
Platform lifts.	P	C	N
Stairs	C	C	N
Ramps	C	P	P
Escalators	C	C	N
Travelators	C	C	N
Handrails	C	P	P
Sanitary for wheelchair users	P	C	P
Sanitary for Children, enlarged WCs, etc.	C	N	N

First Aid Facilities	P	P	N
Surface Finishes	N	N	N
signage (audible)	C	N	N
signage (visual)	C	C	N
signage (tactile)	P	C	N
Acoustics	P	N	N
Audible Communication	C	N	N
Switches and controls	C	P	N
Emergency Requirements	N	C	N
Refuse systems	C	N	N
Furnishing	C	N	N

Table 1 spread sheet featuring Dubai Municipality building code, UAE code of building accessibility in line with ISO/FDIS 21542 (CEN, 2011) (by Author).

4.2 INTERVIEWS RESULTS

4.2.1 Interviews with PWD

Four participants with disabilities were interviewed they all shared in common the following. All with recognized disabilities as per the UN classification, all live in Dubai, all are adults above 18, age range between 19 to 40 years old. The sample included Interviews with five PWDs three females and two males moreover are regular users of Dubai built environment.

The five participants were asked a set of questions to reflect their views on the everyday use of the built environment and they were asked also about what could be provided to enhance such environment to support the functionality of people with disability.

Q1. Are you happy with Dubai built environment accessibility? Justify?

- **R:** To a large extent yes. I am satisfied with the accessible built environment; except for some cases where there are no ramps.

- **M:** Somehow yes; except when the parking area or others are not equipped to deal with the special needs our case demands.
- **S:** Yes I am satisfied. Dubai always sought to consider our special needs while designing buildings in Dubai.
- **N:** Somehow Yes. For me, accessibility means that I can go anywhere using any type of transportation or easily finding parking anywhere. Of course accessibility is not only about being able to enter a building but also to be able to use it on my own. That's why accessibility in Dubai is not as it should be based on my understanding of accessibility. As I have been to many places that do carry an accessible building badge but actually are very difficult to function in.
- **O:** To a large extent, I feel like functioning in Dubai is not very hard, only if they can out people on information desks that do actually know sign language however digital guides has this taken care of.

Q2. What kind of buildings do you deal with in your daily life?

- **R:** Malls and mosques
- **M:** Malls, Emirates Association of the Visually Impaired
- **S:** Malls
- **N:** Malls
- **O:** Dubai Club for Disabled, UAE Deaf Association

Q3. Are there physical barriers that prevent you from functioning normally throughout your day? What are those physical barriers?

- **R:** No chairs to sit on. One time I had to sit on the floor.
- **M:** The design and the way the shops are arranged. For instance, having poles and kiosks in the middle of the way. These are considered physical barriers for People with a visual impairment like me. Also the spaces in the middle should be empty while all the stuff should be arranged on the sides in order to pave the way to pass safely. In addition to stands that are usually placed on the shop front; they should be moved to the sides.
- **S:** No, I don't face any physical barriers though I'd wish moving through the mall can be easier for me by designing certain signs to lead us.

- **N:** Ramps weren't available in every building and if there are, they might be very steep thus I need assistance to get into the building. Another barrier is not having accessible toilets in every building even some hotels in Dubai and some public hospitals in Dubai.
- **O:** Not enough parking plots

Q4. What do you think can be done to help improve the built environment accessibility?

- **M:** For example libraries. There is a library in Dubai mall that I wish to visit but the problem is that usually libraries aren't arranged in a way that allows us to wander and use easily. It will be helpful if there is a guide, who can help us out with the way and place us should move without getting harmed. More over making elevators in malls truly accessible to visually impaired people by the proliferation of braille labels on the button panels in elevators. In addition, to design something that can lead us easily through the mall.
- **S:** Designing an indoor navigation system developed for people who are visually impaired or have low vision.
- **N:** Ensuring that the regulations are being met to even the minimum standards of people with disability.
- **O:** more ATMs for special needs, as only a small number of them are available as well as vendor machines and even digital guides in malls.
- **R:** more places to rest in, as I had to sit several times on the floor which is very hard since I am suffering to sit on the floor.

Q5. On a scale from 1-10, to what extent are you satisfied with the surroundings or the environment?

- **R:** 6
- **M:** 5
- **S:** 7
- **N:** 7
- **O:** 6

4.2.2 Interviews with designers

Three Professional architecture designers were interviewed they all shared in common the following. All are certified designers from Dubai Municipality, all live and work in Dubai, and all are adults above 18, age range between 28 to 40 years old, who have had a chance to design different building types between commercial, residential and public buildings.

The sample included Interviews with three architects one females and two males.

The three participants were asked a set of questions to reflect their views and shared their experiences on the accessibility of Dubai built environment and they were asked also about what could be provided to enhance such environment to support the functionality of people with disability.

Q1, Q2: Are you happy with Dubai built environment accessibility? Justify?

S.H: Well, I can't define it as I am happy it's more complicated hence most of Dubai buildings are well designed and more conferrable for handicaps users using ramps, clear entrances, but you may find some areas in the old Dubai are designed long time ago so it's not totally following the new international principles of design, so you can say that I am satisfied with almost 85% of the built environment accessibility. Thus, on scale 1 to 10, we can say 8.5.

I: I am satisfied by 80% to 90% since most buildings are equipped with ramps. But if I am to judge of the extent to which it's easy to reach the metro station for example, I'd say the percentage I mentioned above would decrease to 50% since most streets in Dubai aren't pedestrian friendly.

M: As a person who is experiencing urban and architectural life in Dubai I can feel that there is a consciousness about the accessibility in general and the environment surrounding buildings and outdoor spaces.

Practically, there is awareness and a high understanding for the accessibility in the city of Dubai. As an architect I do believe that the practice of applying built environment accessibility that deals with humans according to their needs and takes into consideration disabilities, age and gender as well.

Q3, Q4: Are you familiar with Universal design principles? Have you ever implemented them in projects in UAE?

S.H: yes of course. As a designer, I should be up to date with all universal design principles, we did a lot of designs in Dubai and also outside Dubai in the Middle East area and most of those designs should follow the universal principles, to be suitable for all users' specifically handicapped users.

I: No I don't know the universal design principles. We usually prepare design concepts based on the needs of end users, and that helps in creating a simple and flexible use for humans who will be using this place eventually. Safety factors are very important for us while preparing the final set of drawings for any building with the least possible errors if not zero.

M: It's part of our architectural and interior design principles which are important elements that should not be avoided, however the type of the building function -commercial, educational, recreational, administrative- sometimes may need higher application than the others.

Q5: Are you familiar with DM code accessibility regulations?

S.H: yes I am familiar with the DM codes.

I: Yes I am familiar with the DM codes.

M: Yes but I believe they are only considered a starting point, but certain specifications are required as well as monitoring the process of implementation not only by the government but also by people with

disability themselves in order to ensure if these regulations fit them since they are the people with cause thus the only who can evaluate such specifications thus ensuring they are correct.

Q6: Do you think building DM accessibility regulations are easy to implement in building design?

S.H: Well, I can't say it's easy to be implemented, but at the end they are trying to do perfect designs and ensure its safe, durable and meet all users' needs, areas codes and maximum usage of land plots so from scale 1 to 10, we can say 8.

I: While designing, I've taken into account a specific number of handicapped parking plots, ramps on the entrance and elevators but never took into account blind solutions which reflect the fact that those codes are a bit primitive.

M: According to my part of knowledge, I Think that implementing new rules or new applications specially which helps improving the quality for the users is little hard in the beginning and might take the time to get common and spread in an easier format. DM is clearly doing tremendous job and effort to enhance and upgrade their regulations to validate and improve the integrated design principles.

Q7: What are the challenges and obstacles that a designer may face in implementing DM accessibility regulations?

S.H: Well, the greatest challenges are to have good designs that meet all requirements for DM and investors hence the clients need the maximum meters to be built and to be sold, one of the most critical issues for DM accessibility regulations is the handicapped parking plots.

I: Although these codes are easy to implement, the real challenge is having a client who cares and consider the rights of handicapped people. For instance, the client would favor having the one handicapped plot two regular parking plots for greater revenue. But generally speaking, all the buildings follow the DM codes.

M: The main Challenge that might be an obstacle while designing is when trying to match the needs of the users and the space requirements with the regulations which are required. That can occur when the user have special requirements and thoughts and the architect is trying to achieve them with respect to the regulations.

Q8: What do you think can be done in order to improve building accessibility in Dubai?

S.H: I think to improve it, they should create some regulations inside the apartments for the handicapped users or at least percentage of those apartments, toilets and ramps inside the residential buildings not only the accessibility from outside

I: I'd say the government should be stricter in implementing all the DM codes equally and with quality.

M: For any rule or regulation, Society and culture and ethics should be considered. And when this regulation deals with the human performance, it should protect their rights to use this space or the application. Dubai now is one of the leading cities around the world, and that would require consistent updating and for all requirements of users. As long as the safety and well-being of the society is the main concern, this will help them improve and implement an integrated and advanced building accessibility.

They want to but they haven't yet. The law no. 2 set up in 2014 is such an initiative I believe. There are lots of good initiatives, but they are not implemented with quality. They may be in a hurry to meet the deadline thus implementing with errors.

Dubai has good intentions in this area but the whole point is that people making decisions are not people with disabilities who are people with the cause. If you need to decide if something is accessible then let a person on a wheelchair decide. You have to think about priorities too. The issues facing People with disabilities are still not getting the greatest attention.

4.3 FINDINGS RELATED TO RESEARCH QUESTION 4:

In this section of the findings chapter, the researcher conducted several site visits to two of Dubai relatively new public developments that were constructed over the past 3 years, Dubai City Walk & Dubai Galleria Mall. Observation and assessment of both attractions was done under the light of the previously used disciplines of the European Union built environment accessibility report.

The selection of the sample developments was done based on the findings of the interviews conducted with persons with disabilities regarding the most visited places in their daily life activities. This in addition to the fact that such sites are relatively new and its expected that the plan of Dubai becoming an accessible city by 2020 was taken into account right through from the design to execution stages.

The findings are presented in 2 forms:

1. A check list using the previously mentioned disciplines.
2. Pictures taken through the site visit highlighting the site observations in comparison to international standards.

4.3.1 Field observations check list

Each discipline was given one of four criteria as following:

C: Covered (the stated code or design standards are specific with dimensions and information covering the discipline).

P: Partially covered (stated codes & standards are either limited not covering the whole discipline or not specific).

N: Not covered (The code didn't mention the discipline)

n/a: if not applicable

4.3.1.1 External Built Environment:

Discipline (CEN, 2011)	Dubai City Walk	Galleria Mall	Remarks
Access and building Approaches	N	P	
Ramps	N	C	
Stairs	n/a	N	
Handrails	N	N	
External Lifts	n/a	C	
Surface Finishes	N	N	
Crossing Points, Tactile Paving, and Dropped Krebs	N	C	
Drop Off/Pick Up Zones	P	N	
Car parking	P	C	
Obstacles on a path and Street Furniture	P	C	
Seating and rest areas	C	N	
Facilities for Guide Dogs	N	N	
Audible Signage	N	N	
Visual Signage	N	N	
Tactile Signage	N	N	
Lighting (external)	N	N	

Table 2 Showing the findings of the field observations reference to the external built environment of City Walk & Galleria Mall (By: Author)

4.3.1.2 Internal Built Environment:

Discipline (CEN, 2011)	Dubai City Walk	Galleria Mall	Remarks
Entrances	P	C	
Reception Areas, Counters, Desks, Ticket offices	N	N	
Security Provisions	N	N	
Storage Facilities	N	N	
Internal doors	P	P	
Passenger Lifts	n/a	P	
platform lifts/ lifting platforms	N	N	
Stairs	N	N	
Escalators	N	N	
Sanitary for wheelchair users	P	P	
Sanitary for Children, enlarged WCs, etc.	N	N	
First Aid Facilities	N	N	
Surface Finishes	N	N	
Glazing and Manifestations/ markings	N	N	
audible signage	N	N	
Visual signage	N	P	
tactile signage	N	N	
Lighting	P	P	
Acoustics	N	N	
Audible Communication	N	N	
Switches, outlets and controls	P	P	
Emergency Egress Requirements	n/a	N	
Furnishing (seating, Desks, etc.)	N	N	





Table 3 showing the findings of the field observations reference to the Internal built environment of City Walk & Galleria Mall (By: Author)





4.3.2 Field observation pictures

4.3.2.1 Dubai Galleria Mall

Observation	Comment
	The northern approached of the development where a parking lot exists doesn't have access (ramps, crossing point or signage... etc.)
	The drop off zone was utilized as parking spots, no bus station, and no ramps
	2 parking plots was dedicated to PWD according to standard dimensions. However only one of them has a ramp to go over to the side walk, with no pathway that a wheel chair user for example can utilize, to reach the ramp.

	<p>The basement parking access do have a ramp, that is separated from the PWD dedicated parking spot with a speed pump, moreover side walk or pathway from the PWD parking to the entrance.</p>
	<p>Entrance ramps are not safe. (No handrails, not defined, sharp edges ... etc.)</p>
	<p>Ramp slop is as per ISO ramp standards.</p>
	<p>External handicap friendly lift is provided.</p>

	<p>Entrance is clear with no obstacles, as well as a handicap push button.</p>
	<p>Entrance is clear with no obstacles, as well as a handicap push button.</p>
	<p>Obstacles in front of the entrance path. (Not clear).</p>
	<p>Circulation route dimensions are as per standards, with no obstacles.</p>

	<p>Internal elevators is wheel chair friendly. On the other hand no audible notifications.</p>
	<p>Internal Elevator is equipped with Visual notifications are available.</p>
	<p>Basement bathroom door dimension is not sufficient for a wheel chair access.</p>
	<p>Maneuver space inside the bathroom is not sufficient for a wheel chair user, the bathroom doesn't have a dedicated handicap bathroom.</p>

	<p>Obstacles in front of the first floor bathroom entrance, with a maneuvering space that is not enough for a wheel chair user.</p>
	<p>Handicap dedicated bathroom, with outside opening door, that is equipped with a door closer.</p>
	<p>The PWD dedicated bathroom sanitary ware is as per ISO standards.</p>


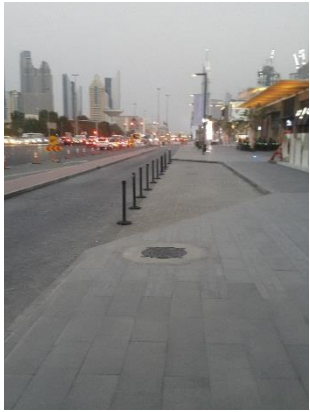


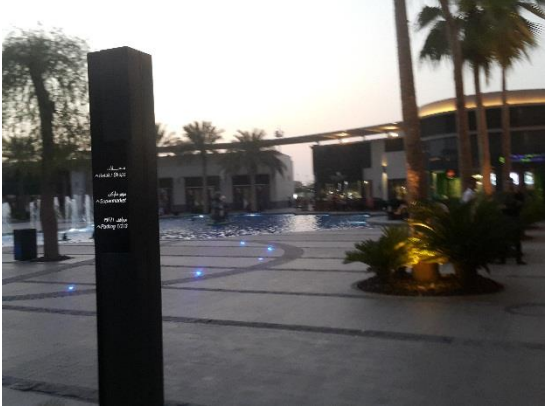
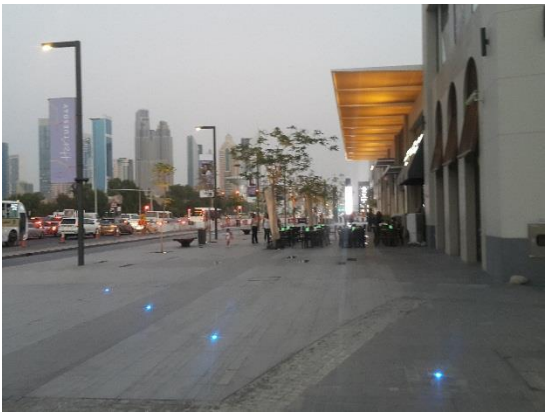




	<p>Obstacles in front of the first floor bathroom entrance, with a maneuvering space that is not enough for a wheel chair user.</p>
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Table 4 showing photographs and field observations of Dubai Galleria mall with comments (BY: Author)

4.3.2.2 Dubai City Walk

Observation	Comment
	<p>Drop off is being utilized by the valet parking.</p>
	<p>All building's approaches, from the parking area, the road and bus stops has no crossing points, dropped curbs or ramps.</p>

	<p>No specific obstacle free circulation route or path.</p>
	<p>Obstacles along the circulation paths</p>
	<p>No handrails, safety signs around the water feature.</p>
	<p>Obstacles in the defined circulation path</p>

	<p>Path width is not sufficient for a wheelchair user to function without constraints, obstacles on the defined circulation paths.</p>
	<p>Circulation path is not sufficient for a wheelchair user to function effectively.</p>
	<p>Path to PWD dedicated bathrooms are obstacle free.</p>
	<p>Dedicated PWD bathroom in all bathroom areas.</p>



	<p>PWD bathrooms are not fitted with the standard sanitary accessories.</p>
	<p>Area inside the bathrooms are at the lowest handicap bathrooms dimension standards.</p>

Table 5 showing photographs and field observations of Dubai city walk with comments (BY: Author)

4.4 SUMMARY OF CHAPTER

In this chapter, the researcher layout the findings and analysis of the data collected from: field observations, interviews, other disability friendly cities action plans, regulations and Universal design principles analysis. The following chapter will include the discussion, recommendations and conclusive remarks.

5 CHAPTER: DISCUSSION, RECOMMENDATIONS AND CONCLUSIVE REMARKS

5.1 DISCUSSION

In the previous chapters research questions were asked and several methods were applied on the hope to answer such question. Several challenges were encountered and with full awareness of the limitations of the study the researcher is presenting the following conclusive remarks that were stemmed from the findings.

In relation to research question one that discussed the Dubai codes and regulations that supports its vision of becoming a disability friendly city by 2020. It was concluded that The Building Regulations and Facilities for the disabled UAE code that was issued by UAE ministry of public works as well as Dubai Municipality building regulation standards didn't fully cover most of the ISO standards as most of the included regulations were general notes or referred to unspecific standards.

Some of the disciplines were considered covered in the building regulations and facilities for the disabled UAE code of which are:

- Ramps and stairs
- Crossing Points, tactile paving & dropped curbs
- Car Parking.
- Obstacles on a path and street furniture.
- External seating and rest areas.
- Tactile and visual signage and way finding system.
- Entrances
- Lobbies, reception Areas, counters, desks and ticket offices.
- Internal doors.
- Internal stairs, escalators, travelators, platform lifts and lifting platforms.

While other disciplines were partially covered with missing information or not having specific details, of which are:

- Access and building approaches.
- Handrails.
- Drop off zones and pick up zones.
- External lighting.
- Circulation routes.
- Passenger lifts.
- Interior ramps and handrails.
- First aid facilities.

However some disciplines were not at all covered by the UAE Building regulations.

- External Lifts.
- Surface finishes
- Audible signage
- Facilities for guide dogs.
- Security provisions
- Storage facilities
- Windows
- Passenger Lifts of existing buildings
- Sanitary Facilities for other users.
- Surface finishes
- Glazing and manifestation
- Acoustic considerations
- Audible communication.

On the other hand Dubai Municipality building code which is considered the mandatory building code in the emirate of Dubai; only considered people with disabilities in article no. 27 over 3 pages (page 41, 42, 43) of the Dubai municipality building code, with general mentions, comments and references to unspecific standards, however some of the disciplines were partially covered of which are:

- Access and building approaches
- Ramps

- Handrails
- Car Parking
- Circulation Path obstacles
- Seating and resting areas
- Visual external signage
- Passenger Lifts
- Sanitary Facilities for wheel chair users

While all the other disciplines were not mentioned or referred to in Dubai Municipality Building Code. Summing up the previous conclusions, the researcher can argue that; Dubai accessibility building regulations are not sufficient and are treated as a plus not as a mandatory discipline, in a crucial time where Dubai is aiming to be the most disability friendly city.

When the views of people with disabilities were sought it was noticed that there is an agreement on the lack of essential considerations when designing for people with disabilities. Those who are blind wanted a wider space to move around in a shopping mall, while people with hearing impairments required digital interactive guiding boards. Participants with physical disabilities revealed how unaccommodating public places are, when it comes to their needs. There was a general agreement among participants with various disabilities while there are some provisions on ground, more needs to be done to support their independence.

On the other hand architects and designers agreed that the main obstacle in order to achieve a disability friendly and more sustainable built environment is the lack of mandatory regulations, and awareness of the added value and importance of accessibility. Moreover the designers highlighted that most of the developments are capital oriented, which in turn affects the accessibility of the built environment due to the absence of firm regulations.

Throughout the field observations that was conducted by the researcher it was noticed that, accessibility is treated as a rubber band saying that

building or development are disability friendly, as most of the components are accessible but stand alone. Arguing that Dubai existing built environment lacks authorities follow up, co-ordination and simulative thinking of how a PWD can use the space or the facility. Since Buildings and developments should work all together as an end product not as separate standalone accessible components.

5.2 RECOMMENDATIONS

The researcher clustered the recommendations into two main sets, one is related to the guidelines and regulations and the other is related to the facilities provided to support the built environment.

In relation to the guidelines and as per the findings of this study the followings are recommended, if Dubai is to achieve its aim being the most disability friendly city within the allocated time frame:

A stronger more defined accessibility codes and regulations is to be developed based on a defined universal standard, of which to be mandatory as a part of the building permit process. This is to be followed by further follow up from the concerned authorities assuring proper execution of the subject regulations.

More detailed specifications is to be included as regulations and codes to guide the designers into shaping a disability friendly Dubai. As the study showed that there are no alignment between Dubai and the federal guidelines, it's recommended to align guide lines avoiding confusion. Accordingly the study would like to offer a set of recommendation that arose from the findings:

- Building approaches to be facilitated, by simulating the possible approaches and access to the building providing the needed to facilitate PWD access on both the development scale and on the building scale.
- Drop off zones to be clear of any obstacles, and not to be utilized for any other use. (Parking spots, Valet... etc.)

- Access from the PWD dedicated parking to the side walk or to the entrance including wheelchair dedicated clear path if needed.
- Safety precautions to be taken for any potentially hazardous design element, for example water feature, in uniform steps, irregular design elements connection, etc...
- Handrails to be provided for ramps.
- Entrance pathways to be clear of obstacles.
- Elevators to be equipped with audible, and visual signage.
- Doors to be accessible, and as per universal design standards.
- Handicap bathrooms and sanitary to be provided.
- Pathways to bathrooms to be obstacle free.
- Bathrooms to be fully equipped with all the needed accessibility accessories.
- Sufficient space for wheelchair maneuver in side and on the way to the handicap bathrooms.
- To provide resting areas for handicapped and older people periodically throughout a circulation route.
- Provide obstacle free circulation routes with sufficient width.
- Audible and visual signage to be provided for maintenance works, in order to overcome any potential hazards as temporary safety precautions.
- Equipping access, circulation paths and services with tactile signage.

Accessibility Specialists or even end-users as people with disability is to be included in the design stages of future developments. More over a simulative study or procedure to be conducted on the building design stage to help designers understand how PWD will access their design case. Buildings and developments is to work all together as an end product not as separate standalone accessible components.

5.3 CONCLUSION

This study was designed to examine an important yet under researched area of research, views of people with disabilities were used as evidence to explore the current situation related to facilities for people with

disabilities in Dubai. Guidelines for both Dubai and UAE were also studied in light of international standards, a set of methodologies were used to alter the research questions. While the researcher is fully aware of a number of limitations that is associated with this kind of study (see chapter 2), the study manage to shed the light on important issues and offer recommendations to support further accessibility for people with disabilities in Dubai. In conclusion it's safe to say this small scale research revealed a real lack of related facilities for people with disabilities in Dubai in a time that Dubai is seeking to become a disability friendly city. The research also revealed that even with the most recently established public facilities, although there are theoretically a number of guidelines that should support designers to offer an accessible facility, there is room for improvement in terms of essential provisions that people with various disabilities would need in order to fully function, meet there daily demands and live an independent life in a least restrictive environment. It is hoped that this study can pave the way for more research to be done in such an important area of research.

In terms of further research, the researcher recommends looking closely at more interdisciplinary research field between architecture and social sustainability that supports the development of a more sustainable community. Another area of further research could be looking into alignment of regulations in UAE. Technology can play a part in further research suggestions as there is recent interest in how virtual reality can support designers to simulate the needs of people with disability during the design stage.

While on a personal level the researcher explored a new area that added to his knowledge, he hopes that such study can offer some support to fellow designers and decision makers.

5.4 SUMMARY OF CHAPTER

In the last chapter, the researcher summed up the conclusions of the study through findings discussion, took after towards recommendations then proposed venues of future research.

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8 **APPENDIX 'A':** (BUILT ENVIRONMENT ELEMENTS –
EXTERNAL ENVIRONMENTS AND APPROACHES TO
BUILDINGS) (CEN, 2011; ISO/FDIS, 2011)

9 **APPENDIX 'B':** (COMPREHENSIVE COVERAGE OF
BUILDING ELEMENTS) (CEN, 2011) (ISO/FDIS, 2011)

10 **APPENDIX 'C':** (BUILT ENVIRONMENT ELEMENTS FOR DETERMINATION ON COMPLETION) (CEN, 2011)

11 **APPENDIX 'D':** (PWD REGULATIONS - DUBAI MUNICIPALITY BUILDING CODE)
