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YILDIZ TECHNICAL UNIVERSITY
GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES

AN ASSESSMENT OF STREET DESIGN WITH UNIVERSAL DESIGN PRINCIPLES: CASE IN ASWAN / AS-SOUQ

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A thesis submitted by Mai Eid Khalil AHMED in partial fulfillment of the requirements for the degree of **Doctor of Philosophy** is approved by the committee on 27 April 2016 in Department of Architecture, Architectural Design Program.

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May 2016

Mai AHMED

TABLE OF CONTENTS

LIST OF ABBREVIATION

AODA	Accessibility for Ontarians with Disabilities Act
APA	American Planning Association
CABE	The Commission for Architecture and the Built Environment
CAPMAS	Central Agency for Public Mobilization &Statistics, Arab Republic of Egypt
CEUD	Centre for Excellence in Universal Design
GAATES	Global Alliance on Accessible Technologies and Environments
ICF	International Classification of Functioning Disability and Health
IHCD	Institute for Human Centered Design
MARC	Mid-America Regional Council
NACTO	National Association of City Transportation Officials
NDA	Centre for Excellence in Universal Design
OCTAE	Office Of Carrier, Technical and Adult Education
PPS	Projects For Public Spaces Organization
SPSS	Statistical Package for the Social Sciences
UD	Universal design
UDI	Universal Design India
UDP	Universal design principles
UPS	Urban Public Space
WHO	World Health Organization
WHO-ICF	World Health Organization's new International Classification of Functioning & Disability

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

AN ASSESSMENT OF STREET DESIGN WITH UNIVERSAL DESIGN PRINCIPLES: CASE IN ASWAN / AS-SOUQ

Mai Eid Khalil AHMED

Department Of Architecture

Ph.D. Thesis

Advisor: Assoc. Prof. Dr. Asli SUNGUR ERGENOĞLU

The street is the river of life of the city, the backbone of the successful community, and the place where people come together. The design of an urban street should accommodate all people and diverse uses. In this context, this study focuses on the concept of "Universal Design (UD) for streets and outdoor spaces". UD is the designing process of environments and products to become convenient and easy for the use of all individuals regardless of age and ability. Additionally, *The 7 Principles of Universal Design* contribute in developing the design of streets, outdoor spaces, and public spaces as well. Implicating those principles in the design process of streets and public spaces result in creating "Inclusive urban streets and public spaces" which accommodate all people. This research also illustrates the concept of "Disability" and some related design concepts. In addition, it also aims to clarify some basic considerations for "Urban street design".

The case study method was used as the main research tool for this research. AS-Souq street was selected as the main focus of the field study in Aswan, Egypt. In this context, this dissertation examines As-souq as an urban public space under the light of Universal Design Principles. The research aspires to achieve *two major* targets: The *first* objective is "to improve the quality of life and to accomplish high life quality in Aswan city", and the *second* goal is "to enable legible, attractive and inclusive streets that are accessible for all".

A descriptive research methodology was also used for this study. The field research of this study encompassed three basic parts: "Survey questionnaire" as a quantitative technique, "Author's observations" and "In-depth interviews" as qualitative strategies which were conducted with government officials, architects, and planners in Aswan city. A questionnaire was conducted in August 2015 to each of 330 respondents selected

for this research. The survey questionnaire was divided into four main sections besides the users' profile. The main focuses of the field study were the four qualities of public spaces (Access & Linkage, Comfort & Image, Uses & Activities, and Sociability).

The statistical analysis of survey questionnaire was achieved by using SPSS program. The survey findings were divided into two phases of analysis. In the first phase, the statistical analysis of the questionnaire items was carried out "individually". Secondly, the statistical analysis was done "comparatively". By discussing the findings of the study from the questionnaire, interviews, and observations, the study has concluded that "Universal Design principles" have not been authorized, regarded or applied to As-souq street in Aswan.

This dissertation also confirmed that applying Universal Design as a strategy ensures equal and democratic rights in society for all individuals, regardless of age and ability; consequently encouraging full participation in social life by ensuring access to and usability of all aspects of society, including the built environment, transport products, information, public services, education, employment and care; thus improving "quality of life" in the urban fabric and the entire community.

Key words: Public space qualities, Universal Design principles, As-souq street in Aswan.

ÖZET

EVRENSEL TASARIM İLKELERI ILE CADDE TASARIMI ÜZERINE BIR DEĞERLENDIRME: ASVAN / AS-SOUQ ÖRNEĞI

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Doktora tezi

Danışmanı: Doç. Dr. Aslı SUNGUR ERGENOĞLU

Cadde, kent yaşamının nehri, başarılı bir toplumun belkemiği, ve insanların bir araya geldiği yerdir. Kentsel cadde tasarımı, tüm insanlar ve farklı kullanımları için elverişli olmalıdır .Bu bağlamda, bu çalışma "Caddeler ve dış mekanlar için Evrensel Tasarım (ET)" kavramına odaklanmaktadır. Evrensel Tasarım çevrenin ve ürünlerin- yaş ve yeterlilik gözetmeksizin- tüm bireylerin kullanımına imkan vermek üzere tasarlanması sürecini kapsamaktadır. Ayrıca, Evrensel Tasarım'ın 7 İlkesi"nin, Caddelerin, açık alanların, ve "kamusal alanların tasarımı"nın geliştirilmesi açısından katkıda bulunduğunu söylemek mümkündür. Bunu, bu ilkeleri tüm insanların yaşayabileceği "Kapsayıcı kentsel caddeler ve kamu alanları" yaratacak şekilde kamu alanlarının oluşturulması aşamasında kullanarak sağlayacaktır. Bu araştırma aynı zamanda "Engellilik" kavramı ve bunlarla ilişkili bazı tasarım kavramlarını göstermektedir. Buna ek olarak, aynı zamanda "kentsel cadde tasarımı" için bazı temel hususları açıklığa kavuşturmayı amaçlamaktadır.

Örnek olay yöntemi, bu araştırma için temel araştırma aracı olarak kullanılmıştır. Mısır'ın Asvan şehrinde yer alan AS-Souq Caddesi, alan çalışmasının temel odağı olarak seçilmiştir. Bu bağlamda, bu tez çalışması için As-souq Caddesi'ni, Evrensel Tasarım İlkeleri bağlamında kentsel kamu alanı örneği olarak incelemektedir. *Araştırma iki büyük hedef* ulaşmayı amaçlamaktadır: *ilk amaç* "Asvan şehrindeki yaşam kalitesini iyileştirmek ve yaşam standartlarını yükseltmeyi". *İkinci hedef ise* "herkesin erişimine açık, anlaşılır, ilgi çekici ve kapsayıcı caddeler yaratmaktır".

Tanımlayıcı araştırma metodolojisi de ayrıca bu çalışmada kullanılmıştır. bu çalışmanın alan araştırması bölümü üç temel kısmı kapsamaktadır: Nicel bir yöntem olarak "Araştırma Anketi", "Devlet memurları, mimarlar ve planlamacılar ile yapılan görüşmeler" ve "Yazarın Gözlemleri" bir nitel stratejiler olarak. Bu çalışma kapsamında 2015 yılı ağustos ayında bu araştırma için seçilen 330 katılımcı ile anket çalışması gerçekleştirilmiştir. Anket, kullanıcı profilllerinin yanı sıra dört ana bölüme ayrılmıştır.

Alan araştırmasının ana fikri kamu alanlarının dört özelliği üzerinde yoğunlaşmıştır (Ulaşım & Bağlantı, Konfor & İmaj, Kullanım & Aktiviteler, ve Sosyallik).

Araştırma anketinin istatistikleri SPSS programı kullanılarak değerlendirilmiştir. Anket bulguları incelemenin iki aşamasında kullanılmıştır. İlk aşamada anket sorularının istatistiksel değerlendirmesi "bireysel olarak" yapılmış; ikinci olarak da "anket, görüşmeler ve gözlemler"den elde edilen sonuçlar kullanılarak "karşılaştırmalı" bir değerlendirme yapılmıştır. Çalışma sonucunda görülmüştür ki, "Evrensel Tasarım İlkeleri" Asvan'daki As-souq Caddesi'nde, dikkate alınmamış veya uygulanmamıştır.

Bu tez aynı zamanda Evrensel Tasarım ilkeleri stratejik olarak kullanıldığında, yaş veya yetenek gözetmeksizin her birey için eşit ve demokratik hakların sağlandığı bir ortam oluşturulabildiğini göstermiştir. Sonuç olarak, toplumun tüm kesiminin kullanabileceği ve ulaşabileceği çevre, ulaşım araçları, bilgi, kamu hizmetleri, eğitim, iş imkânı ve sosyal yardımları da kapsayan bir ortam yaratarak sosyal yaşama tam anlamıyla katılım sağlanabilmektedir. Böylelikle kent dokusu ile toplumun yaşam kalitesi artmış olacaktır.

Anahtar sözcükler: Kamu alanı özellikleri, Evrensel Tasarım İlkeleri, As-souq Caddesi-Asvan.

CHAPTER 1

INTRODUCTION

1.1 Literature Review

A worldwide movement promoting design as a support for independence and participation has evolved in response to an expanding demographic and social reality: more people living with a wide array of disabilities and chronic health conditions than ever before and the longest lifespans in history [1]. The term “Universal Design (UD)” originated in the USA and is now adopted by Japan and the Pacific Rim. It started with a strong focus on disability and the built environment. UD is a new-old concept, rooted in the Disability Movement but applicable to the majority of the world's societies. It is not a trend, but an enduring design approach that assumes the range of human ability is ordinary, not special.

The intent of universal design (UD) is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities with a new attention to design for people with disabilities [2]. By the end of that century, the UD concept grew increasingly. Moreover, its concept is also called "inclusive design, design-for-all, lifespan design or human-centered design" [2]. All have a similar purpose but have different origins and are used in various parts of the world.

After the Second World War, the universal human rights were declared officially in the developed countries of America and Europe, and as a result of that declaration, studies increased significantly to overcome and difficulties and problems faced by the people with physical and mental disabilities.

Elderly, and people with disabilities in **Egypt** as in the other developed countries, absolutely have the same rights, such as living in the community without being

discriminated from the social life, engaging the social activities, enjoying their built environments, receiving services equally, utilizing outdoor spaces, and using buildings designed by Egyptian architects.

This dissertation poses ***four main research questions*** in order to achieve the goals of the study, as follows:

1) Do Universal Design approach and inclusive street design are available at Aswan city?
2) Does AS-Souq street act as an important & inclusive "urban public space" in Aswan city?
3) How to achieve high life quality in Aswan city?
4) How to improve life quality in urban public spaces?

The first research question asks about the existence of Universal Design approach which is the main scope of this study. The second question is concerned with As-souq street as a case study of this dissertation and seeks to inquire about the inclusion, urbanism, and significance of this street. Moreover, this question intends to create an inclusive public space to accommodate all people with different ages and abilities. Question three is more specific to provide a high life quality in Aswan city which is the place of the case study of this dissertation. The fourth question is general one which indicates to enhance a quality of life in whole urban public spaces.

With regard to address those questions, the thesis explored concepts and qualities related to urban life in streets as public spaces. Moreover, the practical part of this dissertation comprehended "The survey questionnaire, In-depth interviews, and Direct Observations", in order to achieve the aspirations and objectives of the research.

1.2 Objective Of The Thesis

The primarily aim is to improve the quality of life of locals and all visitors of As-souq street as well, in the light of universal design principles and its concept. In addition, to enable high-quality street that is accessible one, with a focus on the free movement of vulnerable users such as elderly, pedestrians, children, and disabled. Also, to achieve *an attractive and inclusive street* for all people that enhance the area's sense of place and people's enjoyment of the urban environment. Moreover, to enable *a legible street* that

directs and assists the most casual of users in finding their way around, and *cost effective Street* where materials, finishes and street furniture are strategically applied. Finally, to be *safe and innovative Street* that continues to development and evolution.

The purpose of this study is not only to evaluate, observe, criticize or judge As-souq street under study in compliance with the principles of universal design. The study also aims to *draw the attention to the concept of universal design* for a group of people which covers architects, city planners, industrial designers, teachers, educators, administrators, and investors. Universal Design concept and its theoretical frameworks and historical backgrounds will help to establish a general conceptual perspective and knowledge base to be applied on AS-Souq.

1.3 Original Contribution

The ***scope*** of this study focuses specifically on the fundamental field "Universal Design for streets and outdoors spaces", beside clarifies two other related subtitles "Urban Public Space Design, and Disability" in order to create a vibrant street for all people, by enacting laws & legislations, as well as making possible modifications and settings for the street under study to become a better public space, so that enable and encourage people of all ages and abilities to enjoy and participate, this is because Universal Design is regarded the best approach which provides good and convenient solutions for the street's issues and any other public space.

This dissertation designs its own ***theoretical model*** based on the previous literature survey in order to evaluate, develop and give proposals to achieve a universal pattern which can be applied in which city or country. The study seeks also to understand how can we make this street accessible for all people regardless of the ability and age. The thesis reviews the problems which affect negatively on the street users of the street in light of Universal Design principles & its concept for streets and outdoor spaces, as well as the qualities of urban public space, in an attempt to apply Universal Design principles and its concept, also to understand how to benefit from UD framework for streets to fix these problems which prevent the street's users from utilizing or participating. Hence, to produce a universal pattern which can be applied to another public spaces or streets.

Due to the significance of Universal Design approach which focuses on the user as the first priority. This thesis will concentrate on “AS-Souq street” as an important urban public space in Aswan city to be evaluated and modified in terms of the Universal Design Principles and Urban Public Space Qualities.

Regarding ***the methodology*** of this dissertation, the field research was precisely designed with regard to the concept of "Universal design for streets and outdoor spaces". The case study method was used as the main research strategy. AS-Souq street was selected as the main focus of the field study in Aswan, Egypt. In this context, a random sample of the street's users reflects the characteristics of the population as a whole. Accordingly, the sample in this dissertation was classified by "User type" (Visitors, Shop owners, Architects, and officials) to examine their points of views and opinions concerning the street. As-souq was chosen as a case study since it had various characteristics and particular significance. This dissertation prepared an individual and comparative assessment with reference to the principles of universal design of this case study.

A descriptive research methodology was used for this study. The process of data collection consisted of "Survey questionnaires" as a quantitative technique, "Direct observations & In-depth interviews" as qualitative strategies which were conducted with government officials, architects, and planners at Aswan city.

A survey was administered to a selected sample of the users of As-souq street. A research methodology designed to collect data about this street. The study utilizes a questionnaire as a key survey instrument, besides using interview methodology with officials at Aswan city, planners, and architects. The author's observations also serve as a research instrument. A questionnaire was conducted in August 2015 to each of 330 recipients selected for this study. Additionally, the survey used in this study addressed two purposes. The first purpose was to improve the quality of life of locals and all visitors of As-souq street as well in terms of the principles of universal design. The second goal was to enable high-quality street that is accessible for all people. In addition, to enable an inclusive street for all people.

The questionnaire instrument was divided into four sections, besides, the user's profile. ***User profile:*** items/ questions 1-6, obtained demographic information about the selected sample of the study "The recipients". ***Section one***: *Access & Linkages*, items 7-12,

examined the existence of the accessibility approach at AS-Souq street. ***Section Two:*** *Comfort & Image*, items 13-29, addressed the significance of the street and examined the existence of the accessible outdoor amenities. ***Section Three:*** *Uses & Activities*, items 30-32, reviewed the availability of different species of activities at the street. ***Section Four:*** *Sociability*, items 33-36, measured the respondent's satisfaction about the street. At the end of the data gathering process, these data were statistically analyzed by using (SPSS) program "Statistical Package for the Social Sciences". Tables and graphs were accurately created in order to assess the quantitative results.

In Figure 1.1, the ***theoretical framework*** of this dissertation displays concepts together with their definitions. Besides, context, design principles, and qualities that are used for this study. All mentioned elements of the theoretical model overlap with each other which lead to "Universal Pattern" of the study. The framework also represents "The structure of the case study" of this dissertation which includes three basic components: "In-depth interviews; direct observations and survey questionnaire". Additionally, it shows the participants and physical characteristics of As-souq street as a case study.

This dissertation is **structured** in two main parts: The **first part** is a comprehensive and targeted literature review that aims to determine concepts, definitions, criteria and theoretical frameworks that can be utilized in understanding urban public space concept and applying universal design approach for the street under study in order to supply the foundation for the field research. **Secondly**, a practical/ empirical part, the field research of this study explores AS-Souq street as case study selected from Aswan, Egypt.

The field research was specifically designed with reference to the concepts of *"A street as an urban public space"* and "Universal design for streets". The case study method was used as the main research strategy. "AS-Souq Street" is chosen as the main focus of the field study in Aswan city. This street is chosen as a case study since it had special characteristics and great attention. In this sense, the main concern of this study is *to examine universal design principles for urban public spaces and specifically "streets" with reference to the case study of this dissertation*. In addition, to *providing an inclusive street with regard to the universal design principles* and concept. The structure of this dissertation contains "Five Chapters" as shown in Figure 1.2.

The following section describes some of the most ***significant limitations*** in this study. The fundamental limitation has shown in the focus of "the street's design as a significant element of an urban design", also, as "a major type of an open space". Moreover, the thesis concentrated on the principles of universal design and its approach for streets. In order to evaluate the street in the context of universal design principles.

The contextual limit of the thesis perhaps was that the field research was limited to one street "As-souq street" in Aswan, besides both the individual and comparative results which were obtained concern this street. Additionally, one street in Aswan might also be referred as a limitation and the study can be reinforced with surveys conducted in different parts of Egypt or in different parts of the world.

Furthermore, the limitation of the case study was that the survey was conducted only with local users of the street and with a small number of strangers on site. In addition, the sample of the study did not contain the international tourists. This limit points to a future direction of research to be achieved on streets. Another limitation of this study has revolved around the age group of the respondents which did not encompass the children even nine years old. The last limitation has centered on the place of residence of visitors which referred to Inside and outside Aswan city, not to another international country.

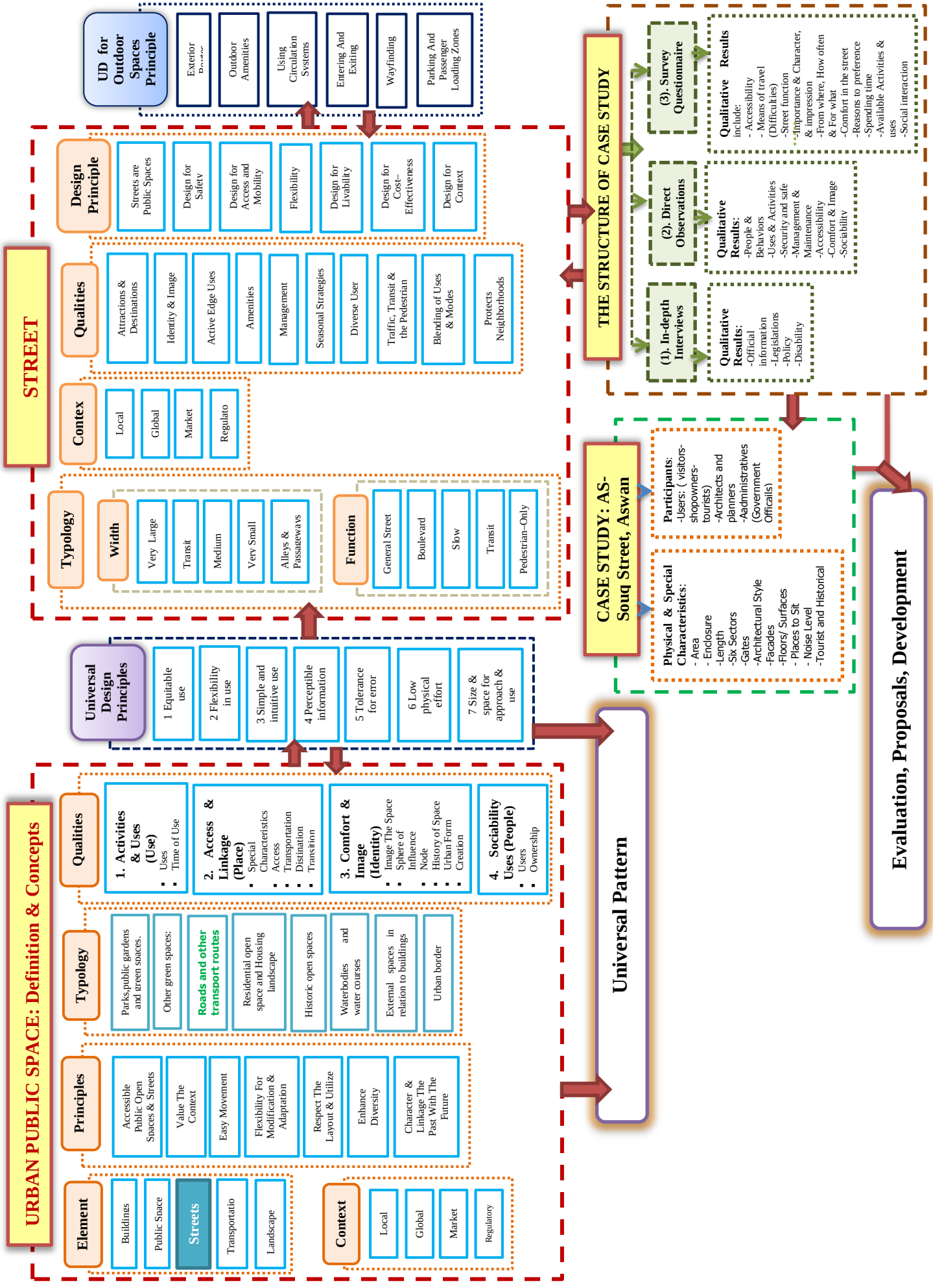

Figure 1.1 The theoretical framework of this dissertation

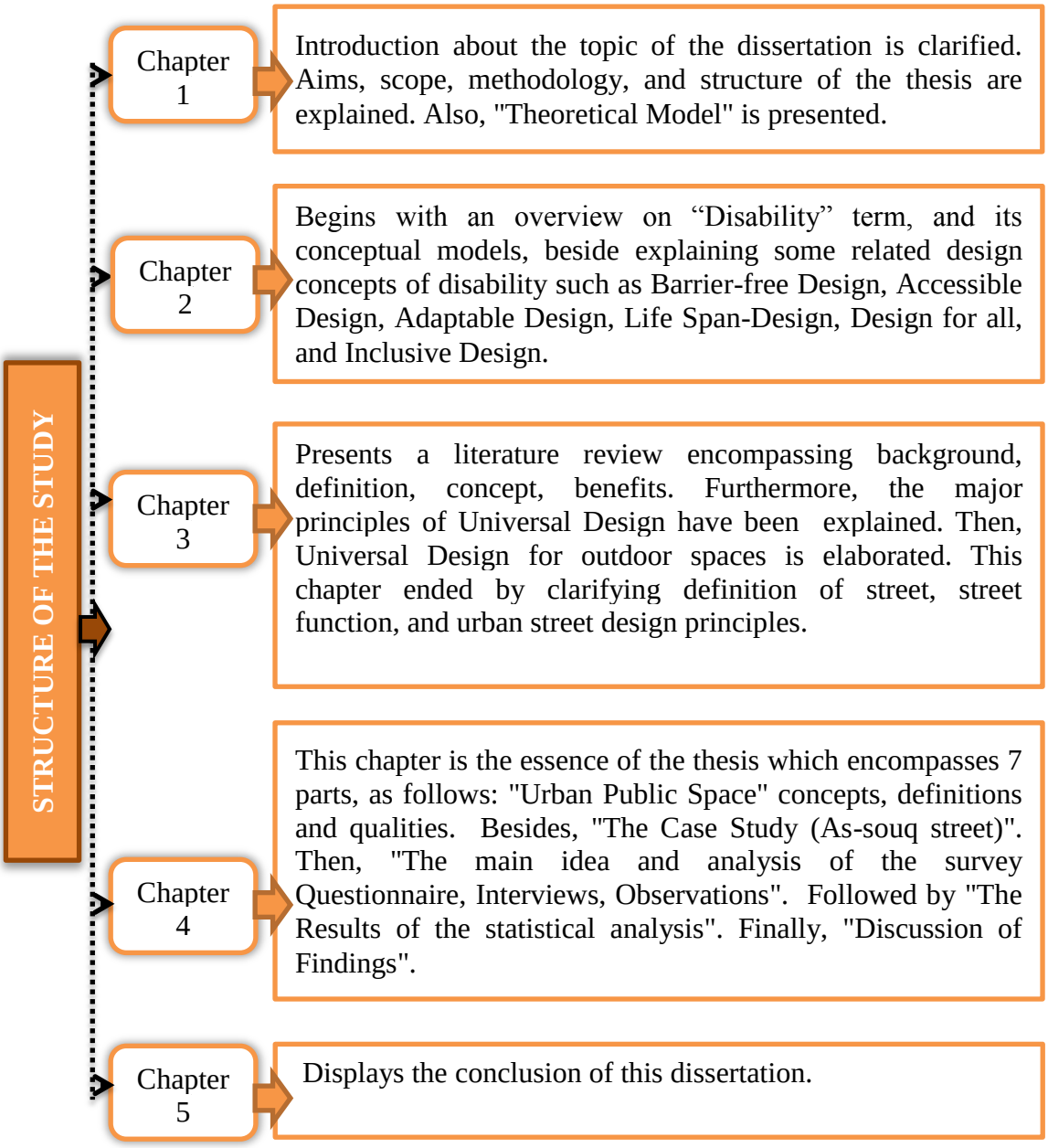

Figure 1.2 The structure of this dissertation

CHAPTER 2

DISABILITY AND RELATED DESIGN CONCEPTS

Many people with disabilities do not have equal access to health care, education, and employment opportunities, do not receive the disability-related services that they require and experience exclusion from everyday life activities. Disability is increasingly understood as a human rights issue. Moreover, it is an important development issue showing that persons with disabilities experience socioeconomic outcomes and poverty than persons without disabilities [3].

The World Health Organisation "WHO" estimates that 1 billion people "over 15% of the world's population" have disabilities. Rates of disabilities are increasing around the world. People with disabilities make up a big part of our society but are often excluded from educational, working and social possibilities that others take for granted. It can be a problem of access since not all shops have ramps for wheelchairs, or maybe schools and universities don't provide proper facilities for people with sight or hearing difficulties. Disability occurs across all age ranges and sexes. Having a disability not automatically mean that a person is not able to work or go to school or elsewhere. It just means that they may need supports in order to do so [4].

2.1 Disability

The term of "Disability" is influenced by cultural and administrative implementations, also, it has been defined by different countries or organizations as follows:

Disability is defined as "Status of people who cannot meet the requirements of normal life and lost their physical, mental, psychological, sensual and social abilities on several degrees due to a congenital or a subsequent disease or accident" by the Republic of Turkey Prime Ministry Presidency of Administration for Handicapped and State Institute of Statistics "TUIK". Whereas its definition in New Zealand is "The

boundedness or inability to perform an activity within a normal style or within the ranges is considered as normal due to an impairment". The definition adopted by Canada "Statistic Canada, 2003" is "Individuals with limitations in performing activities which are considered normal for their peers due to physical and mental conditions and their health problems". Additionally, the definition used in Uganda, on the other hand, is "Any situation obstructive for an individual to live his/her social and work life normally", "UN, 1996" [5]. Ultimately, the definition as "the outcome or result of a complex relationship between an individual's health condition and personal factors, and of the external factors that represent the circumstances in which the individual lives" is adopted by the World Health Organization's new International Classification of Functioning and Disability "WHO-ICF" [6].

The ICF conception of disability is a dynamic interaction between health conditions "diseases, disorders, injuries, traumas etc" and contextual factors [7]. In addition, disability refers to difficulties encountered in any or all areas of functioning. It is understood by the ICF the positive sides of functioning such as body functions, activities, participation and environmental facilitation. The ICF adopts not differentiate between the type and cause of disability for example, between "physical" and " mental" health. "Health conditions are diseases, injuries, and disorders, whereas "impairments are specific decrements in body functions and structures, often identified as symptoms or signs of health conditions. "Disability" arises from the interaction of health conditions with contextual factors "environmental and personal factors" as shown in Figure 2.1 [3].

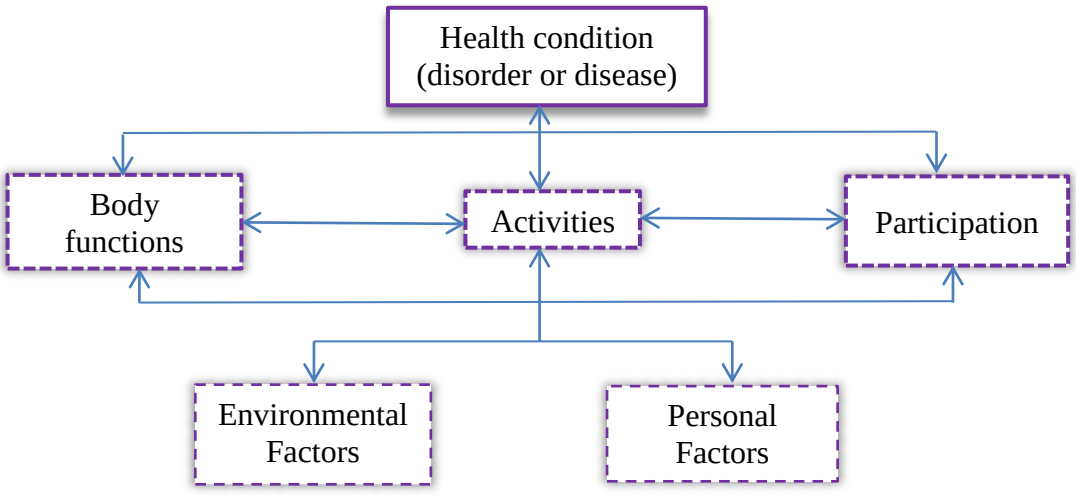

Figure 2.1 Diagrammatic representation of the International Classification of Functioning, Disability and Health [3].

The way disability is defined and understood has also changed in the last decade. Disability was once assumed as a way to characterize a particular set of largely stable limitations. Now the World Health Organization "WHO" has moved toward a new international classification system, the International Classification of Functioning, Disability, and Health "ICF 2001". It emphasizes functional status over diagnoses. The new system is not just about people with traditionally acknowledged disabilities diagnostically categorized but about all people. For the first time, the ICF also calls for the elimination of distinctions, explicitly or implicitly, between health conditions that are “mental” or “physical” [8].

Disability is thus not just a health problem. It is a complex phenomenon, reflecting the interaction between features of a person’s body and features of the society in which he or she lives. Overcoming the difficulties faced by people with disabilities requires interventions to remove environmental and social barriers [9]. The World Report provided a global perspective on Disability which it specified as an umbrella term for impairments, activity limitations, and participation restrictions i.e. the negative aspects of the interaction between individuals and environmental and personal factors [7].

The new ICF focuses on analyzing the relationship between capacity and performance. If capacity is greater than performance then that gap should be addressed through both removing barriers and identifying facilitators. The new WHO ICF specifically references Universal Design as a central concept that can serve to identify facilitators that can benefit all people [8]. The WHO defines disability as a contextual variable, dynamic over time and in relation to circumstances. One is more or less disabled based on the interaction between the person and the individual, institutional and social environments. The ICF also acknowledges that the prevalence of disability corresponds to social and economic status. The 2001 ICF provides a platform that supports Universal Design as an international priority for reducing the experience of disability and enhancing everyone's experience and performance [8].

2.1.1 Conceptual models of Disability

In accordance with the changes in the laws related to the disabled and their rights, the society’s conceptual model of disability has changed. Federal laws now mandate the accessibility of various products, facilities, and services. As these societal changes

occur, the role of universal design becomes more prominent. Conceptual models are formulations about system elements and the relationship between these elements that help people think about complex systems [6].

2.1.1.1 Medical model

In the medical model, disability is seen as a problem of the person, directly caused by disease, injury or other health condition that requires medical care for individual treatment by professionals or physicians. Disability, on this model, calls for medical or other treatment or intervention, to correct the problem with the individual [10].

2.1.1.2 Social model

The social model of disability views disability as a socially created problem and not at all an attribute of an individual. The social model has grown out of the disabilities rights movement. In 1976, the fundamental principles of the social model were published by the Union of the Physically Impaired against Segregation "UPIAS" as follows [6]:

(a) Disability is a situation, caused by social conditions, that requires for its elimination.

(b) No one aspect such as incomes, mobility or institutions is treated in isolation.

(c) Disabled people should, with the advice and help of others, assume control over their own lives.

(d) Professionals, experts, and others who seek to help must be committed to promoting such control by disabled people [6].

2.1.1.3 Systems model

The systems model sees disability as a broadly based distributed phenomenon with its central focus that of maximizing an individual’s functional capabilities within a spectrum of environmental conditions. The systems model integrates elements from both the medical and social models. For the systems model, as with the medical model, there is a focus on the person; but drawing from the social model, the person is an active agent rather than a passive agent for whom and to whom things are done. In the systems model, as with the social model, disability is not seen as an attribute just of the person, but rather brought about by a complex set of interactions with the environment [6].

As a conclusion, the study found that by comparing the three previous disability models, the "Systems Model" provides a more holistic approach to rehabilitation. It combines elements from both the medical and social models. Consequently, this thesis rejects the two previous models and accepts the system model which is regarded a comprehensive approach to disability.

2.1.2 Design and Disability

Disability is part of human condition. Most extended families have a disabled member, and many non-disabled people take responsibility for supporting and caring for their relatives and friends with disabilities [3]. In the International Classification of Functioning and Disability "ICF", the term “Functioning” refers to all body functions, activities, and participation, while “Disability” is activity limitations and participation restrictions [10].

Design requirements for people with disabilities are often the same as for people without disabilities. During the design and construction process, however, requirements can be compromised by economic constraints, aesthetic considerations, and other forces. The average person may be able to adapt to such compromises, but persons with disabilities may not [11]. People who design, or implement legislation have a fundamental duty to ensure that people with disabilities can fully participate in and enjoy the rights, duties, and benefits that the legislation creates [12]. Moreover, creating awareness among designers to find better solutions for a particular design. Helping disabled people to achieve independent living by creating inclusive environments for all users. The design process should address existing problems with suitable solutions [11].

2.2 Related Design Concepts

Recently, several terms have appeared which describe similar though somewhat distinct design concepts. These concepts apply to the design of the products, built environments, and outdoor spaces. Besides, the environments encompass information technologies such as hardware, software, multimedia, websites, ...etc.

In this section, the study examines some of these terms such as Barrier-Free Design, Accessible, Adaptable, Usable, Inclusive and Universal Design that are all approaches to design that can result in products which are easier for everyone to use, including people with disabilities.

2.2.1 Barrier-free Design

Barrier-free design is the absence of obstacles in an environment, therefore allowing persons with physical, mental or sensory disabilities safer and easier access into buildings and then the use of those buildings and related facilities and services [13].

2.2.2 Accessible Design

Accessible Design is the design of entities that satisfy specific legal mandates, guidelines, or code requirements with the intent of providing accessibility to the entities for individuals with disabilities [6]. It is design focussed on principles of extending the standard design to people with some type of performance limitation to maximize the number of potential customers who can readily use a product, building or service [14]. Additionally, Accessible Design usually refers to products and environments meeting prescribed requirements for use by people with disabilities [15]. Accessibility as a design concern has a long history, but public awareness about accessibility increased with the passage of legislation such as the Americans with Disabilities Act "ADA", which mandated that public facilities and services be fully accessible to people with disabilities [16].

2.2.3 Adaptable Design

Adaptable design features are modifications made to standard design for the purpose of making the design usable for an individual, as needed [6]. Built-in Design features that allow flexibility and adjustability, such as a height-adjustable sink and cook top, or adequate framing in walls and additional electrical rough-in allowing simple, economical and structurally adequate modification, including adding grab bars or visual alarms, adaptability accommodates the needs of all occupants and allows more effective functioning [13].

2.2.4 Usable Design

"Usable design" serves to create products that are easy and efficient to use. *Usability* has been defined by the International Organization for Standardization as the "effectiveness, efficiency, and satisfaction with which a specified set of users can achieve a specified set of tasks in a particular environment." Usability engineers test the

ease at which users can learn to operate a product and remember how to do so when they return to the product at a later time [16].

People with disabilities, unfortunately, are not always included in usability tests. Therefore, many products that perform well in usability tests are not accessible to people with disabilities. Increasingly, accessible and universal design considerations are being addressed by usability professionals. Usability shares some key goals with accessibility and universal design. Designers seek to create product features that are easily discovered and operated by the user [16].

2.2.5 Life Span-Design

The design for all ages which accommodates all ages, sizes, and abilities. Thoughtful product design, so that it can be used by anyone to its greatest extent possible. A practical and safe environment for all stages of life. A residence created to be used by all family members, regardless of age, size, health or physical ability. A home that is safe, comfortable, adaptable & accommodating to all who live and visit it [17].

2.2.6 Inclusive Design

Inclusive Design is defined in 2000 by the UK Government as "products, services, and environments that include the needs of the widest number of consumers". It has a history stretching back to the social ideals in Europe that materialized after World War II. These include healthcare and housing for everyone. It is used within **Europe** and goes beyond older and disabled people to focus on other excluded groups to deliver mainstream solutions [18]. Moreover, Inclusive Design applies an understanding of customer diversity to the design of mainstream products to better satisfy the needs of more people [19].

2.2.7 Design for all

Closely related to Inclusive Design, Design for All started by looking at barrier-free accessibility for people with disabilities but has become a strategy for the mainstream, inclusive solutions. As highlighted by the European Commission, it is about ensuring that environments, products, services and interfaces work for people of all ages and abilities in different situations and under various circumstances. This term is used in continental Europe and Scandinavia [18]. Many professionals and students are

interested in this, but there has been no easy source of information, methods, tools and examples to help them achieve it [20].

2.2.8 Universal Design (UD)

The Disability Act 2005 defines Universal Design (UD) as "The design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age, size, ability or disability" [21]. In the most independent and natural manner possible, in the widest possible range of situations, and without the need for adaptation, modification, assistive devices or specialised solutions, by any persons of any age or size or having any particular physical, sensory, mental health or intellectual ability or disability, and means, in relation to electronic systems, any electronics-based process of creating products, services or systems so that they may be used by any person" [22].

The Venn diagram in Figure 2.2 illustrates the relationships among general design, universal design, accessible design, and adaptable design. The rectangle labeled "Entities that are accessible" is explicitly used to emphasize the fact that accessibility can be achieved by design strategies from all design categories. If accessibility is achieved because it is mandated, then it results from accessible design strategies. If accessibility is achieved as a result of an accommodation, it is an adaptable design strategy. Accessibility can also result from applying universal design principles [6].

Furthermore, Figure 2.3 demonstrates how the terms "universal design, accessible, adaptable, lifespan, and Barrier free design" often overlap with one another depending on the specific situation. All of the terms fall within the definition of universal design [15].

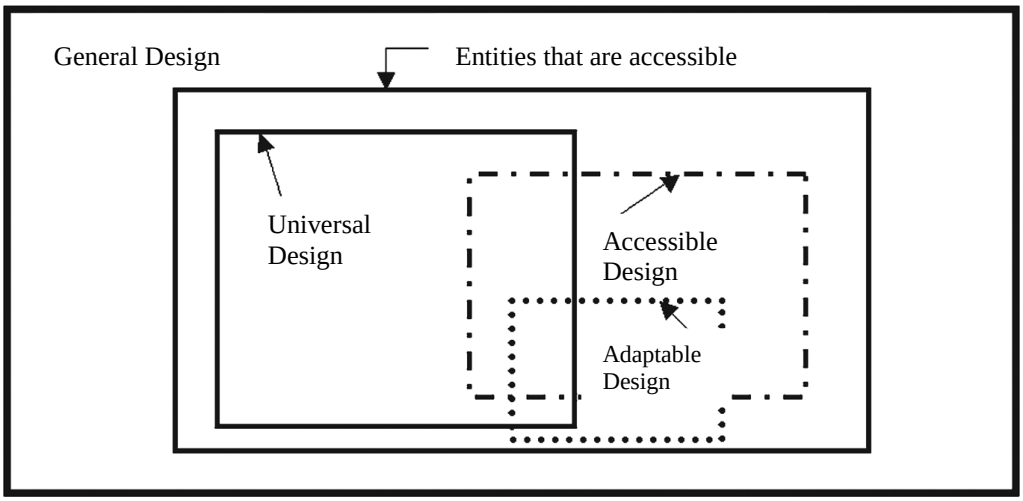

Figure 2.2 Venn diagram illustrating the relationship among general design, universal design, accessible design, and adaptable design [6].

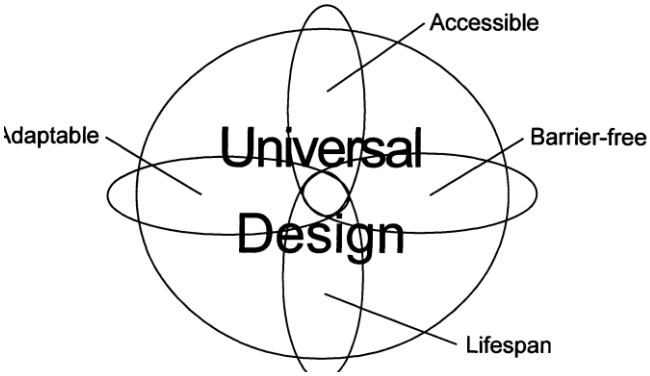

Figure 2.3 The relationship among universal design, accessible, adaptable, lifespan, and Barrier-free design [15].

2.3 Chapter Summary

This chapter has addressed the definition of Disability by different countries and organizations. The conceptual models of Disability are illustrated by introducing each model separately. Then, the two models are rejected by this thesis, and the system model is accepted which is regarded a comprehensive approach to disability. In light of Design requirements for people with/ or without disabilities, some concepts related to design are examined such as: Barrier-Free Design, Accessible, Adaptable, Usable, Inclusive and Universal Design that are all approaches to design that can result in accessible products which are easier for everyone to use, including people with disabilities. Moreover, the relationship of general design, universal design, lifespan, Barrier-free and accessible design are demonstrated by two diagrams.

CHAPTER 3

UNIVERSAL DESIGN

In recent years, a movement known as ‘Universal Design’ has grown in the design of consumer products, as well as in the design of buildings and other facilities. Universal design calls for products and facilities to be designed so that all people can use them, not just persons without disabilities. In many instances, products and buildings incorporating Universal Design end up benefitting all consumers, whether or not they have a disability [12].

3.1 Origin and Background

At the beginning of the 20th century, older adults and people with disabilities were true minorities. The average human lifespan was only 47 years. People are living longer today. The average lifespan has increased to 76, largely due to healthier living, better medicine, and vaccines and sanitation that have virtually eliminated many killers infectious diseases. In addition, more people are now living with a disability. Two world wars created a huge population of veterans with disabilities, and other medical advances enabled people to survive accidents and illnesses which were previously fatal. These demographic changes result in a population that is older and more disabled than many realize, and these trends continue. The limitations imposed by-products and environments designed and built without regard to the needs and rights of all American citizens are significant but often unrecognized [23]. Consequently, the need for adaptable and beneficial products and environments increasingly appeared.

The term universal design originated in the USA [18], and was first entered into usage in the mid-1980’s by the American architect, "Ronald L. Mace" [24]. It started with a strong focus on disability and the built environment. Driven by a large number of disabled Vietnam War veterans, it was modeled on the Civil Rights Movement that

promised "full and equal enjoyment of goods and services". It has been a driving force in establishing American legislation regarding older and disabled people [18]. UD's goal is to bring people with disabilities into the mainstream of society by ensuring equal opportunity and eliminating discrimination based on disability [25]. During the nineties, Universal Design was a concept embraced in several countries. The concept of universal design has now spread worldwide and is practiced in many different ways [24].

Universal design concept has its roots in the field of architecture. It encompassed removing obstacles for people with disabilities, which entailed retrofitting buildings as well as changing the methodology for designing new ones [26]. New ideas and new professional methods have been implemented, and the concept has many names and professionals connected to it, such as Design for All, Inclusive Design, Participatory Design, Human Centered Design, Usability, Life Span Design, Independent Living etc. The way of emphasizing the concept varies upon one's professional background, and also on the society and culture, we are a part of [24]. In Figure 3.1, the difference among Usability, Accessibility, and Universal Design was clarified.

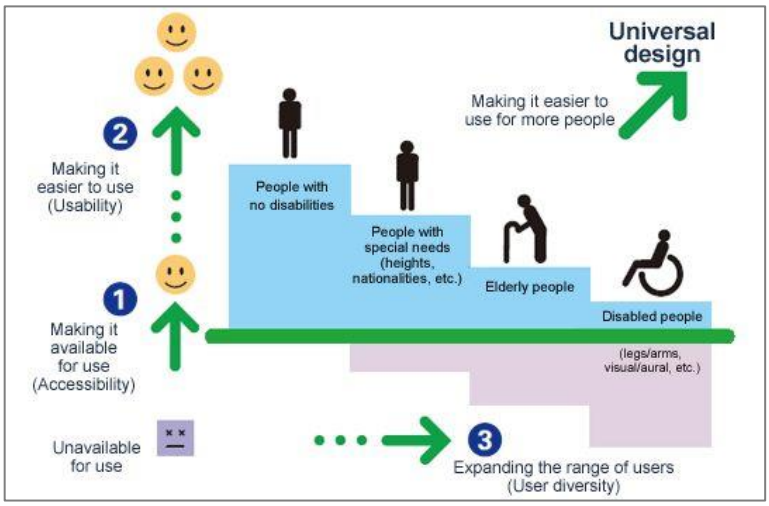

Figure 3.1 Clarification the difference among Usability, Accessibility, and Universal Design [21].

The approach to universal design encompassed considering the needs of the users of a building at the onset. Other disciplines adopted universal design product designers and industrial engineers applied the concept as they realized that better design helps everyone [26]. In the 1990s, the application of the principles of universal design continued to gather momentum. The provisions of the Technical Assistance Program

and the Telecommunications Act of 1996 contributed to an increased awareness and implementation of the principles of universal design [26].

3.2 Definition and Concept

"Ronald Mace", the architect who coined the term “universal design” to describe the concept of designing all products and the built environment to be aesthetic and usable to the greatest extent possible by everyone, regardless of their age, ability, or status in life. He was also a devoted advocate for the rights of people with disabilities which is reflected in his work [27]. "Mace", wrote UD is a “commonsense approach to making everything we design and produce usable by everyone to the greatest extent possible” [1].

"Mace" also said that one of the most important changes brought about by the use of this term was the elimination of the label “special needs” from segments of the population who are working to maintain or gain their independence. Universal design and the ADA both ask that people be viewed as equal in nature, as having similar rights and obligations, and as deserving of equal opportunity in every facet of society. The approach used by both is “people first" [28]. Broadly, UD means that the products which designers design are universally accommodating, that they cater conveniently for all their users [29].

Universal design is a strategy that aims to make the design and composition of different environments and products usable for everyone. It attempts to do this in the most independent and natural manner possible, without the need for adaptation or specialized design solutions [30]. The intent of the universal design concept is to simplify life for everyone by making the built environment, products, and communications equally accessible, usable, and understandable at little or no extra cost [2]. The universal design concept emphasizes user-centered design by following a holistic approach to accommodate the needs of people of all ages, sizes, and abilities. It provides for the changes that all people experience throughout their lives. Consequently, universal design is becoming an integral part of the architecture, design, and planning of the built environment [28].

UD is a concept, approach, or goal to make products and the built environment universally usable by all people everywhere. It accommodates the specific needs of the elderly, people with obesity, those who are very tall or very short including children,

pregnant women, and people with various functional limitations, which tend to have been traditionally ignored. Universal design is dependent on the culture of the people who will be using the specific built environment. That is, universal design may be different in each and every country because it is meant to be universally usable in that place [31].

Additionally, UD is a framework for the design of places, things, information, communication and policy to be usable by the widest range of people operating in the widest range of situations without special or separate design. Most simply, UD is the human-centered design of everything with everyone in mind [8]. Also, good design for everyone, it may be noted, is good for disabled people [29]. It is not a design style but an orientation to any design process that starts with a responsibility to the experience of the user. It has a parallel in the green design movement that also offers a framework for design problem solving based on the core value of environmental responsibility. Universal Design and green design are comfortably two sides of the same coin but at different evolutionary stages. Green design focuses on environmental sustainability, Universal Design on social sustainability [8].

Universal design is a broader concept that is defined by The Center for Universal Design at North Carolina State University as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design [8]. The goal of universal design extends beyond eliminating discrimination toward people with disabilities [25]. Dr. Inger Marie Lid "Oslo and Akershus University College, Norway" stated that Universal Design signifies that diversity in abilities in the human condition is to be accommodated. At a society level, universal design is based on equality and equal opportunities as values. For the individual, this strategy should be linked to plurality, inclusion, and self-respect [24].

Furthermore, UD can be defined as the design of entities that can be used and experienced by people of all abilities, to the greatest extent possible, without adaptations [27]. Thus, some people define universal design as simply “good” design [28]. There can be several examples of universally designed products, Sidewalks with curb cuts and doors that automatically open when a person moves near them are examples of these products. They benefit people with disabilities, parents with baby strollers, delivery workers, and others. These products are often designed to eliminate or

minimize the need for assistive technologies. At the same time, they are compatible with common assistive hardware and software devices [16].

Moreover, Universal Design is not a standard, either national or international, but it may include design factors which might ordinarily adhere to national or international standards. Universal design may or may not include standards, but the design must be universally acceptable and usable by the population that will use the specific piece of the built environment. Universal design does not have hard and fast rules. It is whatever the designer intends for it to be, but it must follow some general principles [31]. Thus, universal design, by its very nature must be participatory. The participation of affected populations will determine the consensus that must drive universal design or universal designing. As the concept of universal design has evolved, a number of general principles have emerged to guide the participatory process in reaching a universal designing consensus [31].

likewise, UD is a philosophy as much as a design code. It is a way of thinking, a mindset that is fully inclusive of all aspects of what the Planning and Development Act 2000 refers to as "proper planning and sustainable development". It involves a considered approach to place making based on an integrated assessment and understanding of the context and user needs. Universal Design permeates the principles that underpin our national and regional planning priorities and can, therefore, add value at all levels in our planning system creating responsive, functional, inclusive and sustainable cities and towns [14]. A basic concept for Universal Design is that people's mobility and accessibility are largely determined by the built environment, that is, the design of buildings, sidewalks, paths, roads and vehicles. Design standards and practices based on an "average" person fail to accommodate many potential users 32. Finally, Universal Design shifts more of the burden from the individual to the community; rather than assuming that people must accommodate to the built environment, it assumes that the built environment should accommodate all users as much as feasible [32].

Today's concept of "Universal Design means that rather than designing your facilities and services for the average user, you design them for people with a broad range of abilities and specific human characteristics such as age, reading ability, learning style, language, culture, and others". Thus, the design of a specific space is driven by the overall concept of creating an area that can be used by as many different types of

people, who have varying characteristics, as possible [33]. According to the Institute for Human Centered Design, "Universal Design is an orientation to design in which designers strive to incorporate features that make each design more universally usable" [1].

Universal design benefits "People with Disabilities, People without Disabilities, and Older Adults. Generally, everyone can benefit from UD [34] as shown in Figure 3.2. Moreover, it engages the aesthetic realm as well as the pragmatic because it has to appeal to everyone. Universal design is about dealing with barriers as artists or scientists would. It demands creative thinking and a change in perspective. It is not sufficient merely to apply design criteria in accessibility regulations in a mechanistic way. Often a change in perspective is needed [25].

Figure 3.2 Universal Design is for everyone [35].

3.3 Benefits

There are numerous benefits to be gained from making innovative designs have universal appeal and be as inclusive as possible [21]. Universal Design proposes a progressive and evolving approach to the development of inclusive environments that can be accessed, understood and used to the greatest extent possible [21]. Not only does Universal Design make good business sense, it also has many compelling social and legal drivers: (To the Individual; To Society; Business Benefits; and Legislation & Standards) [36].

3.3.1 The Individual Benefits

The human-centred approach to design that Universal Design supports is user-friendly and convenient, but is also respectful of user dignity, rights and privacy [21].

The degree of difficulty that people experience when using a product, service or environment can vary, such as "A person who has no significant problems but who would appreciate a well-designed accessible and usable product, service or environment; A person who has little difficulty with all features; and A person who is unable to use the product at all" [36]. In Figure 3.3, the individual benefits of UD for seated users and children are illustrated.

Figure 3.3 Front-loading washers and dryers minimize lifting and are more convenient for seated users and children [30].

3.3.2 The Social Benefits

The age-distribution of the world's population is changing dramatically. People are living longer as a result of medical developments in the last century and healthier lifestyle changes. Within the coming decades in Europe and Ireland, the number of people who are available and capable of assisting and caring for older people will decrease considerably. The number of people living with physical, sensory, mental health or intellectual impairments is increasing, as is the life expectancy of people with particularly severe or multiple impairments. So, the social benefits of Universal Design appear in "Independent Living; Ability as a Continuum; and Participation in Society" [36]**.** In Figure 3.4, Participation in Society is showed.

Figure 3.4 "Participation in Society": The route on the elevated composite structure is wide enough to accommodate a child using a walker [37].

3.3.3 Business Benefits

The benefits to business of adopting a universal design approach vary from increases in potential markets to increased customer satisfaction: "Increased Market Reach; Enhanced Customer Satisfaction and Retention; Market Crossover Success; Positive Public Image; Increased Consumer Expectations, and Accept at First Use" [36].

3.3.4 Compliance with Legislation and Standards

Standards and guidelines provide practical guidance on how to comply with legislation. The specifications and minimum requirements provided in standards and guidelines often include accessibility and usability recommendations [21]. So, with regard to the design of a product, service or environment, Universal Design is an approach that not only promotes compliance but has the much wider potential for improving accessibility and usability, beyond the minimum requirements enforced by law [36].

3.4 The Four Cornerstones Of Universal Design

Universal Design is both convenient and profitable. It is a philosophy of design that removed distinctions among varying abilities by adhering to four major principles. The following four underlying principles that Ron Mace developed to considered essential for creating a universal design. Universal design must be (***Supportive, Adaptable, Accessible,*** *and* ***Safety oriented***). These four interrelated aspects of a design provide useful standards for the measurement and evaluation of new and existing products and environments [28].

3.4.1 Universal design is supportive

The first test of universal design is that it must be supportive: It should provide a necessary aid to function, and it must not, in providing such aid, create any undue burden on any user [28]. The aim of the psychosocially supportive design is to stimulate the mind in order to create pleasure, creativity, satisfaction, and enjoyment. There is an important relationship between an individual's sense of coherence and the characteristics of the physical environments [38]. Consider the lighting used to illuminate a work surface or space. Depending upon the environment "home, work, windowed, enclosed", people need to be able to adjust for different levels and directions of light to support everyday activities. If it lacks these supportive features, it will actually add stress to day-to-day living [28]. In Figure 3.5, the supportive design is illustrated.

Figure 3.5 Supportive design; desk lamp for task lighting [39].

3.4.2 Adaptable Design

"Adaptability" is the ability of a product to adapt to varying service requirements [40]. "Design adaptability" is the capability of an existing design to be adapted to create a new or modified design based on the changed requirements. In adaptable design, similar designs are usually created by modifying the existing designs based on similar but different requirements [41]. "*Adjustable workstations*" are an example of a design that adapts to meet a variety of needs. Desks that adjust in height, with wraparound or detachable surfaces, meet the test of adaptability. Adjustable stands for keyboards and monitors also meet this requirement, as do software programs that allow a computer to display text in varying fonts and sizes. Products such as these are useful for people with

visual impairments and for anyone whose eyesight “Is not what it used to be,” one of the most common complaints of aging [28]. Adaptable Design can be seen in Figure 3.6.

Figure 3.6 Workstations with desks with rounded edges and personalized task lighting [42].

3.4.3 Accessible Design

Accessibility means removing barriers [28]. Accessibility is an important characteristic of the geography of space, whether it involves a small area "e.g., elements within a building" or a large region "e.g., elements within a metropolitan area". It is something to value and improve in an urban setting [43]. For universal design and the ADA, such barriers are both attitudinal and physical. By encompassing a broader range of human abilities. Universal design promotes accessibility because barriers "to mobility, communication, or well-being" inhibit most people. Also, accessible design means rethinking space and equipment to better enable use by all people. For example, curb cuts work for bicyclists and parents pushing carriages as well as for people using wheelchairs. Another example includes placing wall sockets at an 18-inch height from the floor for ease of reach from a wheelchair and creating a travel path free of obstacles [28]. In Figure 3.7, accessible design is illustrated by ARJO’s Freedom Bath.

Figure 3.7 ARJO’s Freedom Bath is easy to access, door open with a view of the seat, grab bar, handheld showerhead, and control panel [44].

3.4.4 Safety-Oriented Design

Safety-oriented design promotes health and well-being. It is corrective and preventative. Using contrasting colors or patterns to mark changes in floor level helps protect against tripping injuries. Desks and cabinets with rounded edges are safer than those with sharp edges. A smoke alarm that also provides a light source can save time in exiting a burning building and can also mark the path of exit. There is more to safety, however than overcoming physical threats. Products and spaces that allow their users to gain a high level of competence support a state of psychological health. They protect individuals from the loss of independence as they cope with changes that occur naturally as they age. Rather, the environment should be flexible enough to accommodate changing human needs and abilities [28]. In Figure 3.8, an example of Safety-oriented design is shown.

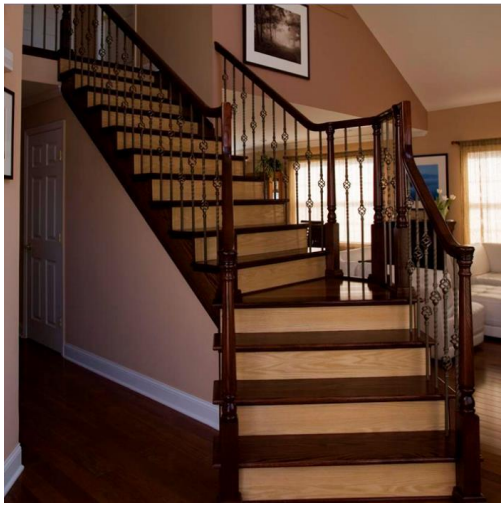

Figure 3.8 Use natural wood as a contrast to dark wood floor stair treads [45].

3.5 The Seven Principles of Universal Design

The *four original principles* of universal design (*Supportive, Adaptable, Accessible,* and *Safety oriented*) have been expanded into *seven principles* of universal design. These have provided a standard against which products and environments can be measured. As the movement has grown, universal design principles have continually been evaluated and refined [28]. A leadership team was formed at the Center for Universal Design in 1997 at North Carolina State University. This group developed a list of seven principles under a grant from the National Institute on Disability and Rehabilitation Research [46].

The intention is that the seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments [47]. Applying the seven universal design principles will support practitioners to better meet the needs of as many users as possible [48]. When working in developing countries, it is important to also take into account cultural, economic, engineering, environmental, gender and social contexts [49]. In Figure 3.9, the seven principles of "UD" are presented.

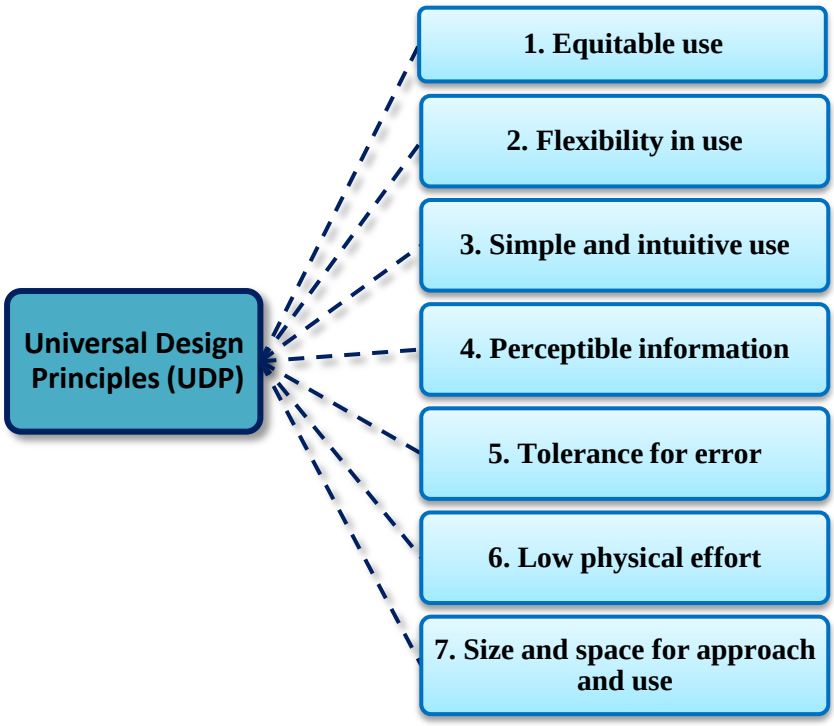

Figure 3.9 Clarification of Universal Design Principles (UDP)

3.5.1 Equitable Use

The design is useful and marketable to people with diverse abilities [50]. This applies to both product design, and location and environment design. In location and environment design, accessibility must be evaluated alongside functionality [51].

Guidelines: (Provide the same means of use for all users: identical whenever possible; equivalent when not; Avoid segregating or stigmatizing any users; Make provisions for privacy, security, and safety equally available to all users; and Make the design appealing to all users) [47]. *For example*, street level crossings of vehicular roadways and pedestrian sidewalks present a complex situation, especially for travelers who are blind or have low vision. Drivers do not obey traffic lights in some cultures. For

instance, in Brazil drivers racing through red lights at night, while drivers with green lights cautiously approached the intersections and then checked cross traffic before proceeding [52]. Cooking in a wheelchair is shown in Figure 3.10, as an example of "Equitable Use Principle".

Figure 3.10 Cooking in a wheelchair accessible kitchen [53].

3.5.2 Flexibility in Use

The design accommodates a wide range of individual preferences and abilities 50. In other words, designs should provide for multiple ways of doing things [48]. Adaptability is one way to make designs universally usable [51].

Guidelines: (Provide choice in methods of use; Accommodate right- or left-handed access and use [48]; Facilitate the user's accuracy and precision; Provide adaptability to the user's pace) [47]. Elevators are *an example* of this principle as most allow the individual to select which floor to go to in a building. Floor buttons are accessible from both seating and standing positions, they are embossed with a number, and the appropriate Braille configuration is posted next to each number. More modern elevators announce floor locations through using digital voice technology [33]. In Figure 3.11, drawer storage adjusts for a variety of pan and dish sizes.

Figure 3.11 Design application, drawer storage adjusts for a variety of pan and dish sizes, from ASID Atlanta Show Home [28]

3.5.3 Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level [48]. For an easy to understand design and location conceptualization, simple and easy to understand choices are helpful [51].

Guidelines: (Eliminate unnecessary complexity; Be consistent with user expectations and intuition; Accommodate a wide range of literacy and language skills; Arrange information consistent with its importance, and Provide effective prompting, and feedback during and after task completion) [54]. Moreover, making public parks, playgrounds, and spaces accessible is just as important as the free use of public facilities such as toilets that serve everybody, including people with disabilities and tourists [52]. Tactile paving for the visually impaired can be seen in Figure 3.12.

Figure 3.12 Tactile paving for the visually impaired which means a line of orientation, guidance, and safety [55].

3.5.4 Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities [48]. In other words, designs should provide for multiple modes of output [51].

Guidelines: (Use different modes "pictorial, verbal, tactile" for redundant presentation of essential information; Maximize "legibility" of essential information; Differentiate elements in ways that can be described [48], "i.e., make it easy to give instructions or directions"; Provide compatibility with a variety of techniques or devices used by people with sensory limitations) [54]. In transportation facilities such as airports, travelers must have clear signage systems and communication of information to find their way around. Japan uses tactile and visual clues on sidewalks and subway station platform. Yellow, rubbery tiles with raised straight lines mean “proceed.” Dots indicate “stop and re-orient” [52]. An example of "Perceptible Information Principle" is explained in Figure 3.13.

Figure 3.13 Microwave oven controls using indicator lights with added fluorescent Braille markings, San Diego Center for the Blind [28].

3.5.5 Tolerance for Error

The design minimizes hazards 48, and the adverse consequences of accidental or unintended actions [50]. As universal design targets different users, it should take all users into account. In other words, designs should make it difficult for users to make a mistake; but if users do, the error should not result in injury to the person or the product [51]. Special elevators for emergency evacuations from high-rise buildings are an example of that principle [52]. Also, the use of handrails, ramps, automatic doors, flexible furniture and so on greatly reduces the chance of an accident and also provides a barrier-free environment that can be easily negotiated [33].

Guidelines: (Arrange elements to minimize hazards and errors: most used elements, most accessible, hazardous elements eliminated, isolated, or shielded; Provide warnings

of hazards and errors; Provide fail-safe features; Discourage unconscious action in tasks that require vigilance) [47]. In Figure 3.14. Magnetic induction cooktop features are illustrated.

Figure 3.14 Magnetic induction cooktop is not hot to the touch, and it does not produce flame or add heat to the kitchen while cooking. It passes the heat directly to the cooking pan [56].

3.5.6 Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue [51]. *For example,* London is considered the most accessible city in the world. All new taxis must have fold out ramps, which take few seconds to put in place. All older model taxis must have one of these ramps in the trunk. In addition, the taxis are comfortable, with high ceilings and multiple seat configurations [52].

Guidelines: (Allow the user to maintain a neutral body position; Use reasonable operating forces) [51]. In Figure 3.15, remote window blind control is illustrated.

Figure 3.15 Design application, remote window blind control [57].

3.5.7 Size and Space for Approach and Use

Appropriate size and space are provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility [51].

Guidelines: (Provide a clear line of sight to important elements for any seated or standing user; Make reach to all components comfortable for any seated or standing user; Accommodate variations in hand and grip size; Provide adequate space for the use of assistive devices or personal assistance) [47]. In Figure 3.16, An adequate space of the entrance which were provided for all people.

Figure 3.16 This entrance provides adequate space for the use of all people [58].

The Principles of Universal Design helped to articulate and describe the different aspects of universal design. The principles' purpose was to guide others, and in spite of their general nature, they have proved to be useful in shaping projects of various types all over the world.

In this regard, the study introduces a brief overview of *Universal Design* in *Japan* and *India*, in order to clarify the differences from a common Universal Design concept and its principles which rooted in the USA.

- **Universal Design India**

The Universal Design India (UDI) principles are stand alone universal design ideologies that focus in Indianness and inclusiveness as they relate to age, gender, disability, caste, class, religion, poverty and urban/ rural background. Furthermore, UDI principles neither make any connection nor build on the 7 Universal Design Principles. They

recognize the overarching importance 7 Principles in the field of universal design [59]. In Table 3.1, the *five principles* of Universal Design *India* were illustrated.

Table 3.1 Table The principles of Universal Design India (UDI) [60].

No	PRINCIPLE	DESCRIPTION
1	**Equitable** / Saman	The design is fair and non-discriminating to diverse users in the Indian context.
2	**Usable**/ Sahaj	The design is operable by all users.
3	**Cultural**/ Sanskritik	The design respects the cultural past and the changing presents and assists all users.
4	**Economy** / Sasta	The design respects affordability and cost considerations for diverse users.
5	**Aesthetics**/ Sundar	The design employs aesthetics to promote social integration among users.

- **Universal Design Japan**

In 2000, Japan launched the Elderly Care Insurance System. Also, the Public Transportation Accessibility Act was passed. Then, in 2005, the Japanese government introduced the General Principles of Universal Design Policy, which declared that buildings and public transportation should be designed using the concepts of Universal Design. Subsequently, in 2006, in an effort to truly implement Universal Design in public transportation, sidewalks, building entrances, and interiors. In downtown Tokyo, for example, almost all subway and rail stations have elevators and accessible restrooms. Almost all buses are wheelchair-accessible compared with just 10 years ago [61].

3.6 Universal Design For Outdoor Spaces

A universal city is by definition, "A city of inclusion where everyone is welcome to participate and contribute". Whether addressing a general building issue (e.g., circulation) or a specific building type (e.g., sports facilities), universal design is a process by which inclusion is ensured for all [62]. According to OPENspace a UK-based research center, there's growing evidence that well-designed outdoor spaces can

enhance the long-term health and wellbeing of the people that use them regularly. If a person with a disability is unable to go out and enjoy what the community has to offer, their quality of life decreases significantly [63].

There can be some elements should be taken into account when designing universally for outdoor spaces, as follows: (***Exterior Areas*** which: "Exterior Routes, and Outdoor Amenities"; ***Using Circulation Systems***; ***Entering & Exiting***; ***Wayfinding***; and ***Parking & Passenger Loading Zones***).

3.6.1 Exterior Areas:

In this part, we will address the components of "Exterior Areas" which include: (Exterior Routes, and Outdoor Amenities).

3.6.1.1 Exterior Routes/ Exterior paths of travel

Exterior paths of travel connect us to where we want to go. Exterior paths of travel differ from recreational trails. These are the sidewalks and walkways intended to provide a functional route [64]. All pedestrian routes should be safe and easy to use by a wide range of persons with disabilities. Generally, such routes should be easily identifiable, clearly separated from vehicular routes, and free of obstacles at all times of the year [65].

- **Sidewalks and Walkways**

Outdoor sidewalks and walkways, identified as exterior paths of travel, connect people to their communities and give them opportunities to explore, play, shop and work. Accessible sidewalks and walkways support the diverse needs of people of all abilities [66]. The firm, stable and slip-resistant surfaces are critical characteristics of accessible routes when walked or wheeled on. Also, the surface of all pathways, trails, and exterior walks shall contain no tripping hazards. Recommended surface types include finely ground stone "stone dust", concrete, asphalt, brick, and rubber. Concrete with a brushed surface is the most preferred, followed by asphalt, brick and then finely ground stone [67].

Appropriate widths, passing areas, and slopes will benefit not only people using wheelchairs but also those with walkers, wheeled luggage or pushing a stroller. A clear width should be Minimum 1,500 mm, but can be reduced to 1,200 mm at the top of the

curb ramp. A Running slope should be no steeper than 1:20 (5%). Also, A Cross slope: No steeper than 1:20 (5%) for hard surfaces "e.g. asphalt, concrete" or 1:10 (10%) in all other cases [66]. In Figure 3.17, Public walkway and city sidewalk are illustrated. Also, In Figure 3.18, recommended types of pathways surface are represented.

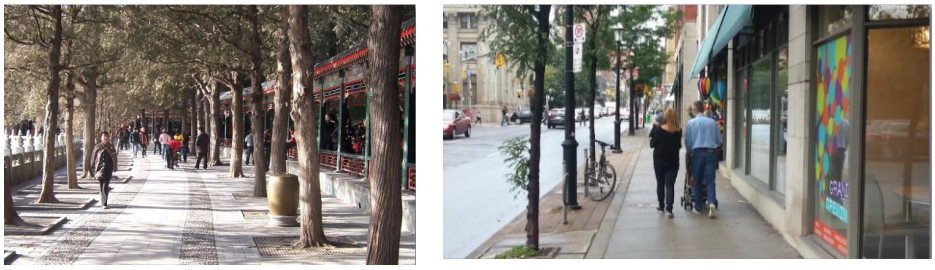

Figure 3.17 Public Walkway and City Sidewalk [66].

Figure 3.18 Recommended types of pathways surface, such as: "Brick; Finely Ground Stone; Brushed Concrete; and Rubber" [67].

- **Crosswalks/ Street Crossings**

Wherever possible, crosswalks at roadway intersections should be located so that the sidewalk and the crosswalk are at right angles to one another. All such pedestrian routes should be free of obstacles, such as light standards, traffic signal supports, temporary objects such as pots, boxes and garbage containers [65]. Street crossings provide continuity in the accessible path of travel [75]. A street crossing should includes: (Curb cuts and ramps should direct pedestrians into safe crossing areas; Reduce pedestrian crossing distance on major crossing routes through extensions or “bump-outs” at the corner or safe islands between center lanes, this helps to minimize hazards [62]; Locate storm drains outside marked crossings; Crossings should be clearly marked with borders, color and/ or texture) [75]. In Figure 3.19, crosswalks at roadway intersections are shown.

Figure 3.19 Crosswalks at roadway intersections [68].

- **Curb Ramps/ Curb Cuts on Public Right of Way**

Curb Ramp means a ramp that is cut through a curb or that is built up to a curb [64]. Also, curb ramps should be provided wherever there is a level difference between the sidewalk, or pedestrian pathway, and the road surface at all street corners, or wherever pedestrian crosswalks are provided [65]. Where a curb ramp is provided on an exterior path of travel, the curb ramp must align with the direction of travel [67]. Additionally, curb ramps will help people with disabilities move from one level to another safely and independently on public pedestrian routes. Where pedestrians cross a roadway, curb ramps should provide a smooth transition for mobility device users. Tactile walking surface indicators will warn people with low or no vision that they are entering a potentially hazardous area [64].

Curb ramps are usually categorized by their structural design and how it is positioned relative to the sidewalk or street. The type of curb ramp and the installation site will determine its accessibility and safety for pedestrians with and without disabilities as follows: (Perpendicular curb ramps; Diagonal curb ramps; Parallel curb ramps; Combination curb ramps; Built-up curb ramps; and Depressed corners) [69]. In Figure 3.20, the curb cut in different conditions is illustrated, also, the components of curb cut can be seen in Figure 3.21.

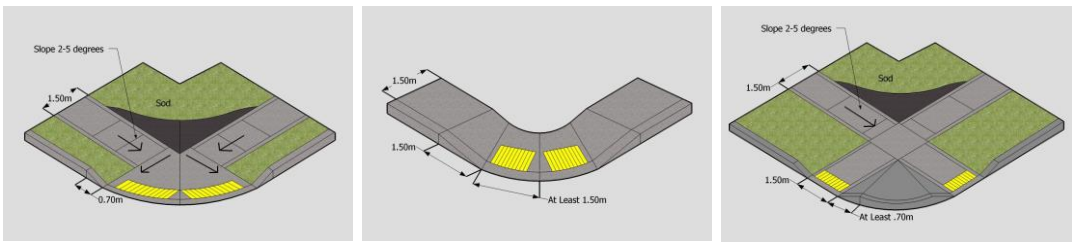

Figure 3.20 The Curb Cut in different conditions [67].

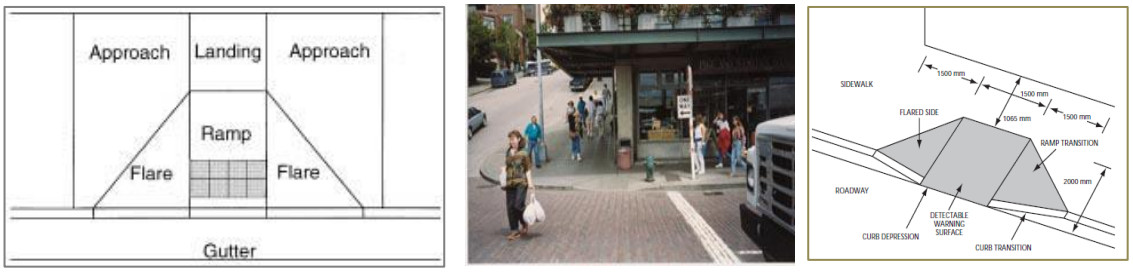

Figure 3.21 The components of a curb ramp [69], and its illustration by one figure & sketch [65].

- **Lay-Bys for Vehicles**

Wherever regular stops for special transit vehicles are provided, a special lay-by area, free of another vehicular traffic is desirable. Lay-by spaces should be level and a minimum of 3050 mm wide by 7925 mm long with a curb cut located towards the rear of the space [65]. In Figure 3.22, A wheelchair ramp is explained.

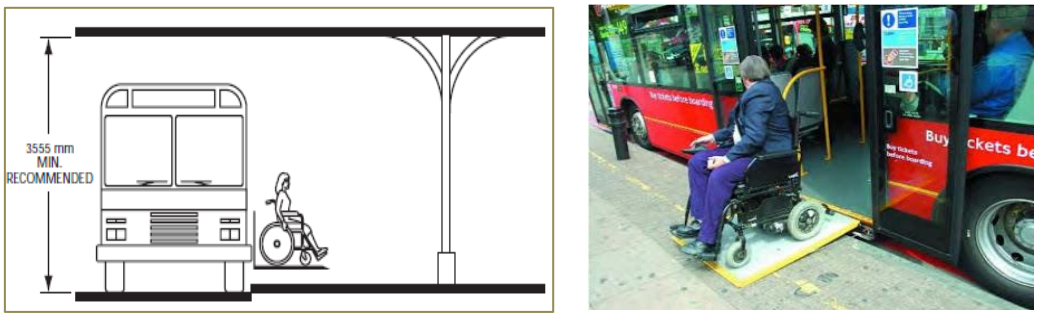

Figure 3.22"Wheelchair ramp", In London, low floor buses are used so the proprietary curbs can be clipped by the vehicle [65], [70].

3.6.1.2 Outdoor Amenities:

All amenities available to the public should be readily accessible and usable by everyone, regardless of age or disability [65].

- **Rest Areas, Benches & Seats**

Rest areas along sidewalks and walkways are important for those who have difficulty walking long distances. They also provide a place for anyone to meet up with friends. Providing seating with armrests and backrests will help people who have difficulty sitting and rising. Including clear space within a rest area accommodates people who use wheelchairs and allows for better flow of pedestrian traffic [66]. Furthermore, Exterior *benches* or *seats* should be located to one side of public walkways or paths and

be mounted on a firm and level base, such as a concrete pad, brick pavers [65]. Also, *Seats* with backrests should be provided at regular intervals along well-used pedestrian routes. Space should be kept clear next to fixed seating to accommodate wheelchair users [73]. Rest areas along exterior paths of travel, and one seat "elevation & side view" can be seen from Figure 3.23.

Figure 3.23 Rest areas along exterior paths of travel, and one seat "elevation & side view" [71], [65].

- **Street Furniture and Vending Machines**

All street furniture, including light standards, signs, planters, mailboxes and vending machines, should be mounted to one side of the normal path of travel so as not to inhibit free movement of persons who have visual limitations, or who use mobility aids [65]. Street furniture must not encroach on pedestrian path of travel [72]. There is a wide range of different types of street furniture, from lighting columns and litter bins to wheeled bins, bollards, and sign poles. Badly sited furniture is an obstruction to people with mobility impairments and people with visual impairments. Free-standing items, such as bollards, are a particular problem for visually impaired people. Also, Badly designed street furniture can also pose a hazard to visually impaired people [73]. In Figure 3.24, different types of street furniture are shown.

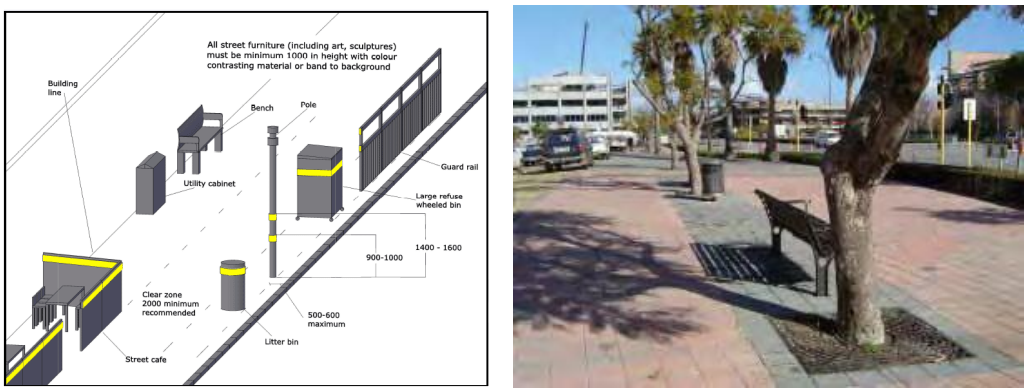

Figure 3.24 Different types of street furniture [73], [72].

- **Recycling bins, and Lighting**

It should be accessible to persons using various mobility aids and be permanently located to one side of any path or walkway so as not to encroach on walkway width. In busy locations, waste receptacles should be securely mounted and be large enough to contain the anticipated amount of waste so that overflows do not cause a tripping hazard [65]. ***Lighting columns*** can obstruct the footway and present a hazard to visually impaired people. Therefore, columns must be located at the back of the footway. In existing locations, columns should be cited consistently either at the back or front of the footway. To reduce clutter at street level in urban areas [73]. In Figure 3.25, Recycling bins, and Lighting columns are shown.

Figure 3.25 Recycling bins, and Lighting columns at Central Park, Perth [72].

- **Signage / Way Signage**

Signage should be simple, uncluttered and incorporate plain language. The use of graphic symbols and universal symbology is helpful for individuals such as children; those with a limited literacy level; or those who speak a different language. Sharp contrasts in color make signage easier for anyone to read, particularly someone with a visual impairment. The intent of the symbol must be evident, culturally universal and not counterintuitive. Lettering on signs should be sufficiently large enough to be read by those with vision impairments and scaled appropriately for the distance at which they are intended to be viewed from [67]. By making a *sign* clear and easy to read for a visually impaired person it will make the sign clear and easy to read for most people [73]. Way Signage in one park can be viewed in Figure 3.26.

Figure 3.26 Albany Highway, Gosnells, Wayfinding Signage [72].

- **Accessible Pedestrian Signals at Street Crossings**

Many pedestrians rely on unmistakable visual cues to safely cross a road such as ‘walk/don’t walk’ indicators, crowding of other pedestrians and movement of vehicular traffic. For people with visual disabilities, such cues may not be evident: they instead rely on accessible pedestrian signals for independent and safe crossing. Accessible pedestrian signals provide a locator tone to help users find the activation button. A different walk indicator tone provides notice of when it’s safe to cross [66]. In Figure 3.27, Accessible pedestrian signals are illustrated.

Figure 3.27 Accessible Pedestrian Signals [66].

- **Toilets**

Wherever possible rest areas should include *toilet* facilities. If there is only space to accommodate one toilet it should be a unisex accessible toilet. These facilities are designed to accommodate disabled adults who require assistance in using the toilet [73]. Accessible toilet "plan, and elevation" can be seen from Figure 3.28.

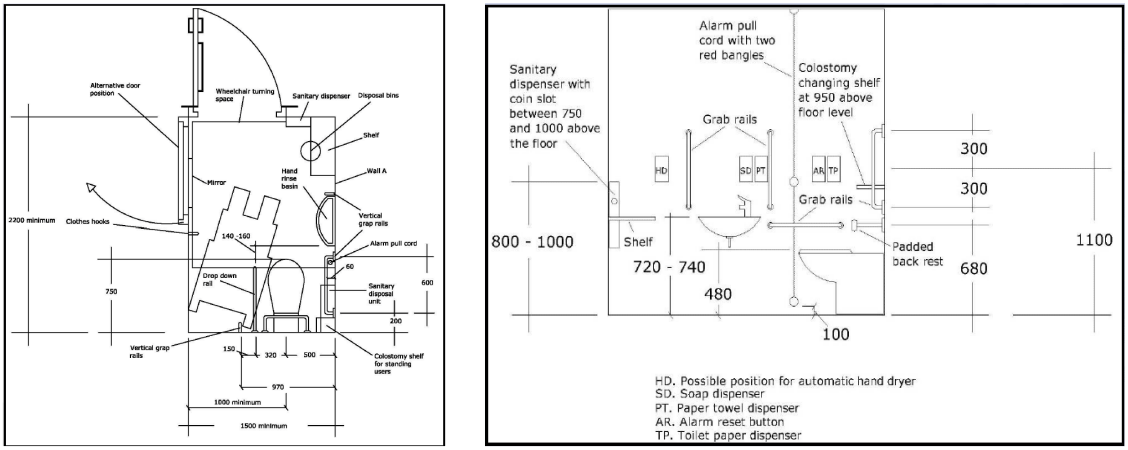

Figure 3.28 Accessible toilet "Plan, and Elevation" [73].

3.6.2 Using Circulation Systems

Moving around outdoors and inside buildings is the essential activity of urban life [62]. Accessibility of resources, in its broadest sense, and the mobility required for that access is what cities are all about [74].

- **Exterior Path Planning and Design**

The layout of path systems should establish a pattern that is safe and accommodates the needs of people on the site and in buildings. Planning should give consideration to the needs and preferences of people who move at different paces and may have varying abilities. People should not encounter unexpected obstacles on a path [62]. Also**,** ***exterior path*** should achieve the following:

- Provide easy and direct access to all facilities [62].
- Provide accessible pathways for the full range of path types on a site. Where there are both primary and secondary pathways, for example, each should be accessible [75].
- Locate seating and rest stops near but out of the flow of pedestrian traffic [75].
- Separate pedestrian, vehicular, and bicycle/ skating pathways. When adjacent to one another, clearly mark the boundaries between each [62].
- Avoid steps and curbs in pedestrian and bicycle circulation areas. Even one step can be a hazard and a barrier [75].
- Edges of pathways should be clearly marked "e.g., textured borders" [75].

In Figure 3.29, the balls clearly demarcate the boundary between vehicles and pedestrians.

Figure 3.29 The balls clearly demarcate the boundary between vehicles and pedestrians but could also pose a trip hazard [75].

- **Grades, Elevation Changes, and Handrails:**

Wherever possible, *grades* on roads and sidewalks should be designed so that the slope of pedestrian routes does not exceed (1:20) [65]. Furthermore, continuous *handrails* should be provided on both sides of all ramps or stairs, or wherever three or more steps are provided. Handrails should be a smooth, easy to grip design, no more than 50 mm in diameter [65]. In Figure 3.30, ADA handrail system is represented.

Figure 3.30 ADA handrail system is easy to install, economical, and fully compliant [76].

- **Ramps and Stairs:**

Ramps help people with disabilities safely and independently move from one level to another on public pedestrian routes. Ramps should not be too steep and should provide enough turning space for: (users of wheeled mobility devices; families with strollers; and visitors with luggage). Where an exterior path of travel is equipped with a ramp, which must have a minimum clear width of 900 mm. The surface of the ramp must be

firm, stable and slip-resistant. Also, it must have a maximum running slope of no more than (1:15) [64].

The requirements for ***stairs*** are intended to improve safety and accessibility for all stair users, including people with disabilities. Stairs may not be an option for people using wheeled mobility aids, but they will be used by many people with different types of disabilities and all other users of the facility [66]. It is important to ensure that *ramps*, *stairs*, *steps*, and *handrails* are designed and constructed so that all pedestrians can use them safely [62]. A ***ramp*** should achieve the following: (Provide ramps and stairs at grade changes. Where ramps are short and the slope is less than 6.5%, the ramp alone is sufficient; Ramps should be wide enough to accommodate the expected pedestrian flow. This may be greater than the minimum required for wheelchair use; Design ramps for all to use rather than as special accommodations for wheelchair users; If ramps are long, provide level resting platforms periodically; Provide no more than ten risers on stairways between landings; Use non-slip and non-glare surfaces and edges) [75]. In Figure 3.31, wheelchair and handicapped ramps are clarified.

Figure 3.31 Wheelchair and handicapped ramps [77], [78].

3.6.3 Entering and Exiting

It is imperative that the design of entry and exit conditions ensures their ready use by everyone.

- **Finding the Building**

Before people can enter a building, they first must be able to find it. The use of external landmarks that distinguish the building from other nearby facilities can help people locate it. Also, should include [62]:

- Use distinctive exterior design features on or near the entrance of a building to make the building easy to distinguish from other nearby buildings.
- Such cues should involve more than one sense "e.g., employ visual, informational and tactile properties as detection devices" to provide the flexibility necessary to accommodate a range of individual preferences and abilities.

❑ **Identifying & Approaching: "The Entrance or Exit"**

Successfully entering or exiting a building includes a person's ability to move away after passing through the doorway. Primary paths of travel leading away from the entrance and exit should be provided that are readily perceptible to anyone and free of level changes and obstructions that could impede movement [74]. In Figure 3.32, The entrance is not virtually distinguished from adjacent window panels.

Figure 3.32 This entrance is virtually impossible to distinguish from adjacent window panels [62].

3.6.4 Wayfinding

Wayfinding is the organization and communication of our dynamic relationship to space and the environment. Architectural wayfinding systems use the design and organization of Landscaping, urban amenities, and buildings as spatial indicators [62]. Also, wayfinding allows people to: determine their location within a setting, determine their destination and develop a plan that will take them from their location to their destination [79]. There are five primary architectural wayfinding elements: (***Paths***/ circulation; ***Markers***; ***Nodes***, ***Edges***, and ***Zones***/ districts) [80].

3.6.5 Parking and Passenger Loading Zones

Parking and passenger loading zones are critical components of any design and therefore deserve as much attention as building entrances or circulation spaces. Without sufficient parking, certain people are inconvenienced, or worse, excluded. Inability to park near a building prevents them from participating in activities, attending an event or purchasing products. Public facilities that provide adequate parking can make locations more usable, safe and appealing [80]. Wherever car parking facilities are provided, they should consider the needs of all car users, including parents and carers with young children [81].

- **Off-street parking structures**

Off-street parking facilities must provide the following two types of parking spaces for the use of persons with disabilities [67]:

Type (A) spaces are wider spaces, primarily intended to accommodate a person who uses a vehicle equipped with a mechanical lift or wheelchair ramp. They incorporate space beside the parked vehicle for the deployment of the lift or ramp and must be marked as “Van Accessible”. Also, they can be used by anyone who has a valid accessible parking permit. **Type (B) spaces** are standard parking spaces, primarily intended for people who use wheelchairs, canes, crutches or walkers but who don't need the extra space for a lift or ramp [66]. In Figure 3.33, and Figure 3.34, accessible parking spaces which have type "A & B Spaces" are illustrated

- **Access Aisles**

Access aisles, the space between parking spaces that allows persons with disabilities to get in and out of their vehicles, must be provided for all parking spaces for the use of persons with disabilities in off-street parking facilities. It also may be shared by two parking spaces for the use of persons with disabilities in an off-street parking facility [67].

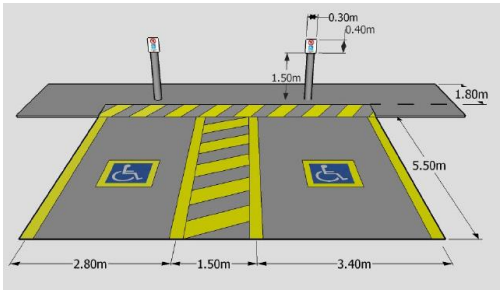

Figure 3.33 Accessible Parking Spaces which have a type (A & B) Spaces, and Access Aisles [67]; and Van Parking Side Exist Ramp (Type B Spaces) [66].



Figure 3.34 Accessible Parking with Wheel-Stop (Type A Spaces) [66].

- **Signage**

Each accessible parking space must be delineated by a sign that is mounted vertically on a post that is color contrasted with the surrounding and background environment, and at least 300 mm wide and 400 mm high. It should be installed at a height of 1.5 m from the ground surface to the bottom of the sign [67]. *Signage* and street furniture should be kept clear of parking spaces and placed at the rear of the surrounding footway [73].

- **On-Street Parking Spaces**

Accessible on-street parking not only benefits the people who use it, but also the schools, businesses, and facilities served by the parking. It can be located on a public highway, street, avenue, parkway, bridge, or similar type of road [66]. In Figure 3.35, accessible on-street parallel parking space is represented.

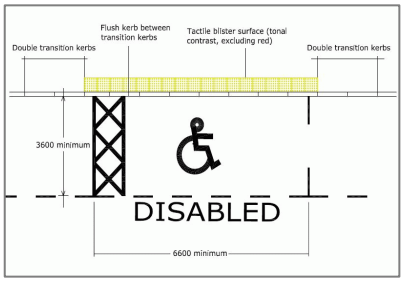


Figure 3.35 Accessible on-street parallel parking space "e.g. in the town center" [73], [66].

- **Universal Design Criteria for Parking and Passenger Loading Zones**

Criteria of Universal Design for parking spaces, as follows [80]:

- ✓ Shuttle service that is equipped with a wheelchair lift to eliminate the need to travel lengthy distances to certain facilities (for example, stadiums and amusement parks), with parking that is far from any entrance.
- ✓ Emergency phones at large parking facilities.
- ✓ Alternate parking area for buses and other larger vehicles.
- ✓ Adequate lighting in all parking areas and at passenger loading zones.
- ✓ Routes from accessible parking do not pass behind parked vehicles.
- ✓ In large parking facilities, color-coded zones with easy to remember locator identifiers such as names identified on prominently displayed signs in that area.
- ✓ Pedestrian pathway indicators "including signs, crosswalks, planters, bollards, etc." that identify.
- ✓ pedestrian pathways through parking lots.
- ✓ Speed bumps and “slow” signs strategically located in parking lots to prevent speeding and increase safety.
- ✓ Covered areas of parking for protection from inclement weather.
- ✓ Passenger loading zones that do not impede a vehicle or passenger traffic.
- ✓ Temporary parking areas, such as “15-minute parking” to prevent double parking at entrances.
- ✓ Easy-to-use, secure, short-term bicycle parking that does not obstruct main circulation paths.
- ✓ Separate entrance and exit point into parking areas to eliminate traffic.
- ✓ Valet parking service where parking lots are located along the distance from the building.

3.7 Street Design And Considerations

Streets make up the greater part of the public realm. Better-designed streets, therefore, contribute significantly to the quality of the built environment and play a key role in the creation of sustainable, inclusive, mixed communities consistent with the policy objectives of Planning Policy Statement. Streets should not be designed just to

accommodate the movement of motor vehicles. It is important that designers place a high priority on meeting the needs of pedestrians, cyclists, and public transport users so that growth in these modes of travel is encouraged [82].

3.7.1 Definitions

A clear distinction can be drawn between streets and roads. *Roads* are essentially highways whose main function is accommodating the movement of motor traffic [82]. Besides, roads are used to distribute traffic, while “A street is multi-functional and is a place to live, work, walk, cycle, interact and spend time” [83]. Additionally, *streets* are typically lined with buildings and public spaces, and while movement is still a key function, there are several others, of which the place function is the most important [82]. A *street* may have these attributes, but its more common meaning is a road in a town or village, comparatively wide as opposed to a lane or alley. More importantly, it is a road, that is the linear surface along which movement occurs between the adjacent houses. "It runs between two lines of houses or shops” [84].

"Projects For Public Spaces (PPS)" mentioned that "Great streets are the backbone of successful communities" [85]. Also, streets are the lifeblood of our communities and the foundation of our urban economies [86]. "William H. Whyte" stated that “The street is the river of life of the city, the place where we come together, the pathway to the center" [87]. They make up more than 80 percent of all public space in cities and have the potential to foster business activity, serve as a front yard for residents, and provide a safe place for people to get around, whether on foot, by bicycle, car, or transit. The vitality of urban life demands a design approach sensitive to the multifaceted role streets play in our cities [86]. Streets are critical arteries for transporting goods and people, but they are also the places where we live, work, play and interact [86]. The design and management of an urban street must reflect and accommodate these diverse and competing uses. The layout and operation of streets can prioritize and enhance particular uses for the benefit of all [86]. For the purpose of this analysis, the street will be taken as an enclosed, three-dimensional space between two lines of adjacent buildings [84]. Ultimately, architect *"Louis Kahn"* stated: (In a city the street must be supreme. It is the first institution of the city. The street is a room by agreement, a community room, the walls of which belong to the donors, dedicated to the city for common use. Its ceiling is the sky. Today, streets are disinterested movements not at all

belonging to the houses that front them. So, you have no streets. You have roads but you have no streets) [88].

3.7.2 Functions Of The Street

The street provides a link between buildings, both on the street and in the city at large. As a link, it facilitates the movement of people as pedestrians or within vehicles and also the movement of goods to sustain the wider market and some particular uses within the street. Also, its expressive function also includes its use as a site for casual interaction, including recreation, conversation, and entertainment, as well as its use as a site for ritual observances [84]. Furthermore, streets have multiple functions, ranging from being routes allowing movement of people and goods, and being spaces for gathering and conducting other public activities. Historically, streets have played a very important role for a variety of reasons, such as providing an environment to meet friends and neighbors, being a platform for political protests, and a location for markets and fairs, even being play areas for children in the residential setting [89].

Additionally, streets in cities serve many purposes besides carrying vehicles, and city sidewalks, the pedestrian parts of the streets serve many purposes besides carrying pedestrians [90]. In addition to being a physical element in the city is also a social fact. It can be analyzed in terms of who owns, uses and controls it; the purposes for which it was built and its changing social and economic function. It also has a three-dimensional physical form which, while it may not determine social structures, does inhibit certain activities and make others possible [84]. In the planning of a street, the physical factors that appear most to influence street use are, according to "Schumacher", user density, land-use mix, pedestrian-vehicular interaction, configuration, and context. Besides, in the design of the residential street, a proper balance is required between privacy, defensible space, access for the car and safe pedestrian use of street [84].

3.7.3 Street Qualities

"Jane Jacobs" declared that “Streets and their sidewalks, the main public spaces of a city, are its most vital organs” [83]. "Jennifer Lawandus" explained the ten qualities that contribute to the success of a street [91]:

3.7.3.1 Attractions & Destinations

Having something to do gives people a reason to come to a place and to return again and again. When there is nothing to do, space will remain empty, which can lead to other problems. In planning attractions and destinations, it is important to consider a wide range of activities for men and women; people of different ages; different times of day, week and year; and for people alone and in groups. Create an enticing path by linking together this variety of experiences [92].

3.7.3.2 Identity & Image

Whether space has a good image and identity is key to its success. Creating a positive image requires keeping a place clean [91], and well maintained, and capable of being maintained without excessive costs [93], as well as fostering a sense of identity. This identity can originate in showcasing local assets. Businesses, pedestrians, and driver will then elevate their behavior to this vision and sense of place [91].

3.7.3.3 Active Edge Uses

Buildings bases should be human-scaled and allow for interaction between indoors and out. Preferably, there are active ground floor uses that create valuable experiences along a street for both pedestrians and motorists. For instance, a row of shops along a street is more interesting and generally safer to walk by than a blank wall or empty lot. Sidewalk activity also serves to slow vehicular traffic [92].

3.7.3.4 Amenities

Successful streets provide amenities to support a variety of activities. These include attractive waste receptacles to maintain cleanliness, street lighting to enhance safety, bicycle racks, and both private and public seating options, the importance of giving people the choice to sit where they want is generally underestimated. Cluster street amenities to support their use [91].

3.7.3.5 Management

An active entity that manages the space is central to a street’s success. This requires not only keeping the space clean and safe but also managing tenants and programming the

space to generate daily activity. Events can run the gamut from small street performances to sidewalk sales to cultural, civic or seasonal celebrations [92].

3.7.3.6 Seasonal Strategies

In places without a strong management presence or a variety of activities, it is often difficult to attract people year-round [91]. Utilize seasonal strategies, like holiday markets, parades and recreational activities to activate the street during all times of the year. If a street offers a unique and attractive experience, the weather is often less of a factor than people initially assume [92].

3.7.3.7 Diverse User Groups

It is essential to provide activities for different groups. Mixing people of different race, gender, age, and income level ensure that no one group dominates the space and makes others feel unwelcome and out of place [92].

3.7.3.8 Traffic, Transit & the Pedestrian

A successful street balances the competing needs of the street driving, transit, walking, cycling, servicing, parking, drop-offs, etc [93]. Also, it is easy to get to and get through; it is visible both from a distance and up close. Accessible spaces have high parking turnover and, ideally, are convenient to public transit and support walking and biking. Access and linkages to surrounding destinations must be a part of the planning process. Automobile traffic cannot dominate the space and preclude the comfort of other modes [92].

3.7.3.9 Blending of Uses and Modes:

Ground floor uses and retail activities should spill out into the sidewalks and streets to blur the distinction between public and private space [92].

3.7.3.10 Protects Neighborhoods

Great streets support the context around them. There should be clear transitions from commercial streets to nearby residential neighborhoods, communicating a change in surroundings with a concomitant change in street character [91].

3.7.4 Accessible Streets For People

The Accessibility Standards for the Built Environment focus on removing barriers in two areas "Buildings, and Public Spaces" [94]. Public space is a space we share with stranger people who aren't our relatives, friends or work associates. It is space for politics, religion, commerce, sport, space for peaceful coexistence and impersonal encounter" [95]. It is all around us, a vital part of everyday urban life: the ***streets*** we pass through on the way to school or work, the places where children play, or the local parks in which we enjoy sports [96].

Public spaces should be easily accessible and integrated into the surrounding urban fabric. They should have a clear identity and have an intended and feasible use that encourages social activity. Successful places provide equal opportunities for everyone, both now and for future generations [97]. Accessible public spaces include specific features that make it easier for everyone people with disabilities, seniors and families to use public spaces. Some of these features are: "Sidewalks that are free of barriers and wide enough to move around; Pedestrian signals at intersections with both audible and visual cues to move people safely across the street; Gentler ramp slopes; Wider accessible parking spaces for people with mobility limitations; Service counters that a person seated in a mobility device can use" [98].

Furthermore, accessible public spaces include recreational elements like trails, outdoor eating areas and play spaces that people of all abilities can enjoy, etc. Accessibility requirements for the design of public spaces address elements that are located outdoors as well as some that are located inside of buildings. Accessibility benefits everyone. Good public spaces are planned and designed from the beginning with accessibility in mind. Accessibility by design can provide people with disabilities with more opportunities to work, shop, travel and play independently [98].

Furthermore, the public realm is one of the most important components of any city or neighborhood. As such, the built form and streetscape treatments should provide an attractive, safe and comfortable pedestrian environment. This can be achieved through a variety of design responses, which include, but are not limited to, ground level facade treatments "ie transparent glass that shares the interior activities with the street", architectural details, paving patterns, shade, seating, adequate sidewalk widths and other features [99].

Streets are places too and can contribute significantly to the quality of the built environment [97]. Design streets to incorporate elements that enhance human scale, embrace neighborhood character, provide green infrastructure and balance needs for many modes of sustainable transit, including pedestrians, bicyclists, automobiles, and transit [100]. "Allan B. Jacobs" stated that "*A great street should be a most desirable place to be, to spend time, to live, to play, to work, at the same time that it markedly contributes to what a city should be*" [100].

3.7.5 Design principles of Inclusive Urban Street

In an urban context, the street design must meet the needs of people walking, driving, cycling, and taking transit, all in a constrained space. The best street design also adds to the value of businesses, offices, and schools located along the roadway. Designing world-class streets begin with a restatement of the problem and the means by which to understand that problem. These seven principles establish a clear understanding of the primary goals, ideals, and tenets of world-class street design [86]. In Figure 3.36, The principles of urban street design are demonstrated.

Figure 3.36 The seven principles of urban street design [86].

3.7.5.1 Streets are Public Spaces

Streets are often the most vital, yet underutilized public spaces in cities. Conventional highway design standards tend to look at streets as thoroughfares for traffic and measure their performance in terms of speed, delay, throughput and congestion. In reality, streets play a much larger role in the public life of cities and communities and should be

designed to include public spaces as well as channels for movement [86]. The street design should be useful to people with diverse abilities. For example, *curb cuts* are useful to parents with strollers, aging pedestrians, and people using canes or wheelchairs. Rather than stairs and a ramp, consider grading the approach for everyone [101]. In Figure 3.37, Streets as Public Spaces at Germany & San Francisco are illustrated.

Figure 3.37 Streets as Public Spaces include outdoor space and public seats, Freiburg, Germany [102], & San Francisco, CA, USA [103].

3.7.5.2 Design for Safety

The city's efforts to enhance street safety through engineering, education, and enforcement have helped contribute to the lowest number of pedestrian fatalities and serious injuries [104].

- Prioritize safety for all street users, particularly more vulnerable groups "children, the elderly, those with disabilities" and more vulnerable modes "walking, bicycling" [105].
- Design streets serving primarily local trips at slower speeds to reduce crashes and injuries and discourage cut-through traffic [105].
- Research, test, and evaluate innovative new safety treatments, particularly those successfully adopted in other cities [104].

The street safety should be the first priority of the city to enable street which is usable by all pedestrians [104]. The street design should minimize hazards and the adverse consequences of accidental or unintended actions. For instance, allowing sufficient time for crossing helps parents with children, aging users, and people with disabilities cross the street safely [101]. Pedestrian safety islands, New York City can be seen in Figure 3.38.

Figure 3.38 Pedestrian safety islands, New York City, USA [106].

3.7.5.3 Design for Access and Mobility

The street design should communicate information effectively to the user, regardless of weather or other local conditions, or the user's hearing or sight. For example, accessible pedestrian signals that are visible and clearly audible (e.g., state "walk") can improve safety and usability for all users by giving feedback that the pushbutton works and to wait for the signal [101]. With a growing population and limited right-of-way, street designs should provide efficient ways to move people and goods and improve the economic vitality of the city [105].

- Prioritize walking, bicycling, and transit by providing safe, accessible, convenient, and comfortable facilities for these modes, particularly on designated routes and at critical network connections [105].
- Accommodate truck traffic and deliveries while minimizing their negative impacts on neighborhoods [104].
- Strive to meet accessibility standards [104].
- Accommodate emergency vehicle access [104]. In Figure 3.39, Amsterdam nicely accommodates pedestrians, cyclists, and mass transit.

Figure 3.39 The Koningsplein, Amsterdam nicely accommodates pedestrians, cyclists, and mass transit [107].

3.7.5.4 Flexibility

Transportation engineers can work flexibly within the building envelope of a street. This includes moving curbs, changing alignments, daylighting corners and redirecting traffic where necessary [86]. Many city streets were created in a different era and need to be reconfigured to meet new needs. Street space can also be reused for different purposes, such as parklets, bicycle parking, and pop-up cafes [86]. Innovation street designs can be seen in Figure 3.40.

Figure 3.40 Innovative street designs: "pedestrian plaza in lower Manhattan can provide more space for people & protect them from vehicle traffic" [108], and "Castle Street improvements, UK" [109].

3.7.5.5 Design for Livability

Beyond their use for moving people and goods, streets comprise an extensive network of public open spaces that can facilitate social, civic, and economic interactions [105].

- Expand usable public open space by reallocating underutilized roadway space to create pedestrian plazas, expanded sidewalks, corner, and mid‑block curb extensions, and opportunities for green planted areas [105].
- Design streets to encourage physical activity for all ages and populations by making walking, bicycling, and transit attractive and convenient [104].
- Include public seating when there is an appropriate maintenance partner [104].

In Figure 3.41, Curb extensions can provide usable neighborhood space for community gathering.

Figure 3.41 Curb extensions can provide usable neighborhood space for community gathering and socializing [110].

3.7.5.6 Design for Context

Streets help define the character of neighborhoods. Their design should refer to the surrounding context, including the history, land uses, and nearby landmarks [104].

- Preserve the unique character of neighborhoods [105].
- Support connections to adjacent land use by providing gathering spaces and pedestrian access to and from major destinations [105].
- Design local streets to be green, traffic-calmed environments that encourage walking, bicycling, and recreational activities [111].
- Design through-streets to balance the accommodation of traffic with safety and community needs [104].

The street design context can be seen in Figure 3.42.

Figure 3.42 The street design refers to the surrounding context, including the history at "New Malden High Street", London [112].

3.7.5.7 Design for Cost–Effectiveness

Reconstruction of city streets requires substantial financial resources. The list of worthwhile projects competing for a limited pool of funding is extensive. It is, therefore, important to ensure that street designs are cost-effective [105].

- Consider full lifecycle costs and benefits when developing street designs. Besides their initial capital outlays, the measurable long‑term economic, environmental, safety, health, and other benefits of well‑designed, well‑managed streets should be taken into consideration [104].
- Design streets to meet the city’s future needs. Streets are reconstructed very infrequently. Consideration of future conditions and needs should be part of the planning process [105].

3.8 Chapter Summary

In this chapter, background of universal design and definition are demonstrated to understand its concept, origin, and meaning. In the light of the importance of universal design approach, the benefits of UD are clarified at different levels. The four basics of UD are mentioned to pave the way to the seven principles of universal design by "Mace" (USA) which are more common and spread worldwide. Moreover, the five principles of UD in India are illustrated, it is intended to understand the differences and similarities from the common seven principles which originated in the USA. Universal design has rooted in the architecture field, so the approach of universal design for outdoor spaces are explained, its goal is to perceive the elements should be taken into consideration when designing universally for outdoor spaces. For instance, "Exterior areas, Using Circulation Systems, Entering & Exiting, and Wayfinding". Finally, some related concepts of streets are illustrated such as "definition, functions, qualities, design principles of the inclusive urban street, and accessible streets".

CHAPTER 4

CASE STUDY: AS-SOUQ STREET

4.1 The Model Of The Study

In this part, the study addresses the reasons for selecting As-souq street as a case study, as well as presents the structure of the case study and introduction about As-souq street and Aswan governorate as well.

4.1.1 Definition Of The Problem

A street is the main part of our community and a public space which plays a vital role in our daily life. When a street is not proper or qualified to accommodate all people regardless their abilities or ages, this directly and negatively affect the wide range of people who use the street such as: elderly, disabled people, children, and maybe lead to segregation.

Egypt was well known as a historic and tourist country since ever. It has a rich and valuable architectural heritage in most of its cities which represented in lots of areas, districts, some residential neighborhoods, many **streets**, squares, and a huge number of historical buildings. Some **Egyptian streets** have a unique character in a revival of the cultural and historical heritage of the country beside their commercial function. Moreover, some of those **streets** are regarded fundamental public spaces for tourists and local residents as well.

This dissertation will examine one significant street in **Aswan** city, Egypt under the name of "**Saad Zaghloul St**reet" or "**AS-Souq Street**" as a case study. It is considered as the main artery of Aswan city and has special importance over the ages. It is regarded a historic, commercial and tourist street in this city. Additionally, AS-Souq St. is one of

the most charming market and famous commercial street for both local people and tourists.

In this regard, I had conducted a helpful research two years ago about this street under the title of (***Urban Regeneration Of Saad Zaghloul / AS-Souq Street and Its Impact***) which specified a fundamental role of the street for local residents, and the importance of the new improvements which have been done over the past few years. The questionnaire was prepared to infer the impression of native people towards these changes. Also, it was conducted by ***35 respondents***, 25 visitors of the street and 10 shop owners. The questionnaire has composed of two parts. The first one related to general questions about the street, and the other part concerned with the impression of local people around those modifications. As a result, All respondents confirmed the importance of the street for them and mentioned that the street is better after its regeneration. Also, they extremely admired the idea of changing the street to be the path for pedestrians only in most of its sections.

Despite, an urban regeneration of As-souq street which happened in the last few years, however, the street still has more issues than ever before. "**AS-Souq**" has many problems which impact negatively on the street users and sometimes, prevent disabled people from go shopping or passing through. There can be many problems which faced by people with disability, elderly pedestrians and young children which find difficulty to use the street in some of its sectors. Moreover, Blind, deafblind and partially sighted people which depend on using the curb as an orientation clue to know where they are in a street and to navigate, they already find more difficulty to pass through the street because there are no enough pavements in some sectors of the street, and when they are existing without any curb ramp, also they do not consider the users of different ages and abilities. Without a distinctive pavement, disabled and elderly people express concerns about having to share the space with vehicles and cyclists. Whereas, most of the street's sections are allocated to pedestrians only, just one sector for both vehicles and pedestrian. However, approximately all sectors have different problems faced the street's users.

4.1.2 Structure Of The Case Study

As shown in Figure 4.1, AS-Souq street has some unique *physical characteristics* such as "gates, landmarks, its division for six sectors, enclosure,..etc. Besides, the

participants of this study are "users whether visitor or shop owner, architects/ planners, also government officials".

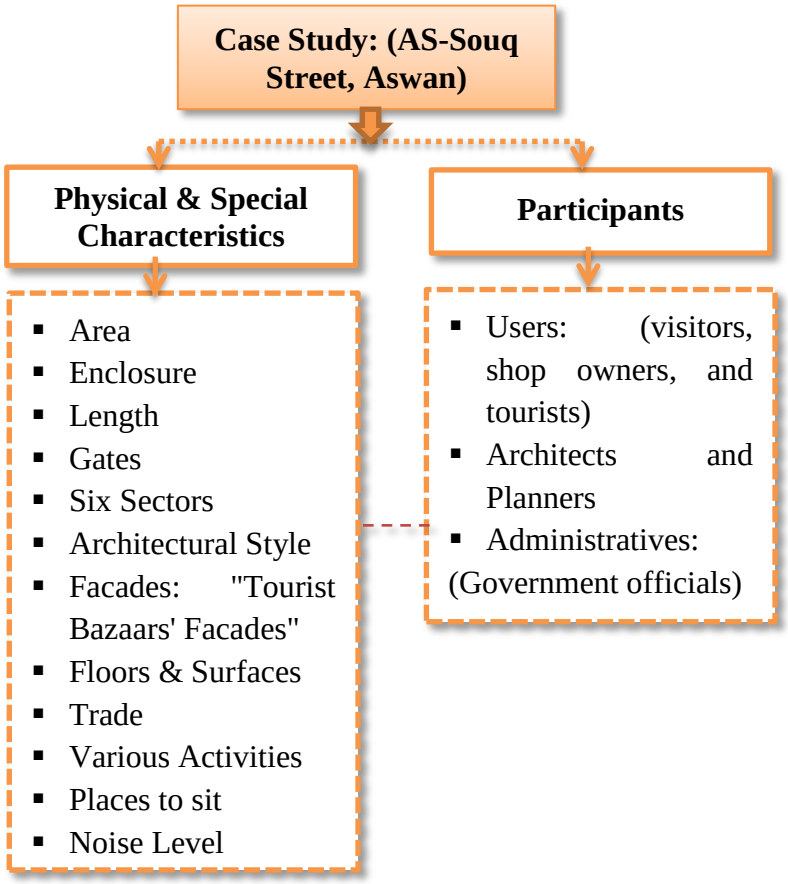

Figure 4.1 Explanation of a case study of this dissertation "AS-Souq street"

In this regard, the **structure** of **the case study** of this thesis consists of **three parts**, see Figure 4.2

1) **In-depth Interviews** with "Government official at Aswan governorate, Aswan Municipality, Decision-making committee, Urban Planning Unit, the Ministry of Housing: Utilities and Urban Communities, The Information Center of Aswan governorate, East and West Aswan district, the local unit of Aswan city".
2) **Direct Observations**, is a "supplementary technique" alongside with the survey questionnaire and related to the particular characteristics of AS-Souq street.
3) **Survey Questionnaires** conducted with "Visitors, Shop owners, Responsible persons/ "Government officials", Architects and planners"

Data sets were qualified depending on "The **four** main **qualities**" which were determined as follows **(Access & Linkages, Comfort & Image, Uses & Activities,** and **Sociability**), besides "**User Profile**" of As-souq street's respondents.

The data set includes (gender, age, educational level, occupation, marital status, number of children, home/car ownership, mode of visit, mean of travel and its difficulties, from where, frequency of visits, since when/ familiarity, for what, spending time, spending pattern, reasons of preference, Comfort in the street, Available Activities & uses, Social interaction, and accessibility). Accordingly, "The survey ***questionnaire***, the ***interviews***, and ***observations*** about the case study of this dissertation" are being achieved based on the four main qualities of public spaces.

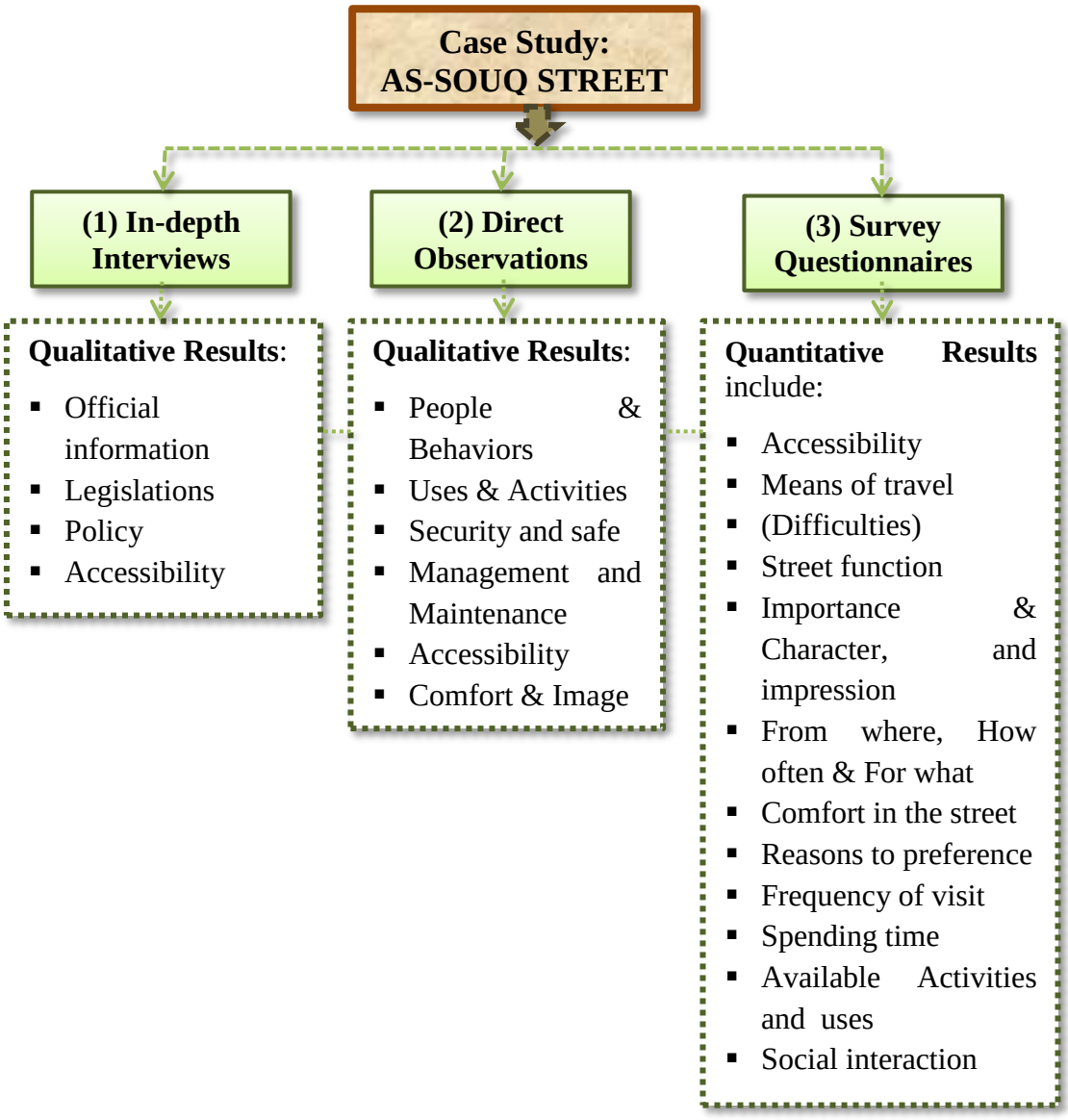

Figure 4.2 The structure of the case study of this dissertation.

4.1.3 Overview about As-souq Street

"Aswan Souq" is a colorful bazaar that offers Egyptian and African goods.It has a rich cultural and commercial history. Locally known as "Sharia AS-Souq", where the word "Sharia" in Arabic means "Street", so It is the same of "AS-Souq street". It is a popular place to buy souvenirs in Aswan. The bazaar is located in parallel to "The River Nile", and it has plenty of Egyptian and African goods. Traders sell a wide variety of goods such as perfumes, peanuts, henna powder, dried hibiscus flowers, spices, T-shirts, and custom made Ancient Egyptian styled souvenirs. Inside alleys, you'll find traders selling Nubian artifacts such as skullcaps, talismans and baskets, Sudanese swords, spices and carpets, and stuffed animals such as crocodiles [113], see Figure 4.3.

"**Sharia AS-Souq**" has a unique character and special significance for local residents and tourists as well. It is a lively market full of colorful merchandise, besides being the most famous, tourist and historic street in Aswan city, Egypt.

Figure 4.3 The colorful products at "AS-Souq street" for both locals and tourists.

AS-Souq street is located in the heart of Aswan city, which connects "The Train Station Square" in the north to "Abbas Farid Street" in the south, see Figure 4.4. AS-Souq is divided into **six** sectors by diverse gates and intersections such as "Hmaimi Gabalawy st.", Abd El-Majid Abu Zaid st. (Al Matar st.), "Al Sayeda Nafisa st.", "Salah El-Din st.", and "Abbas Farid street" [114], see Figure 4.5.

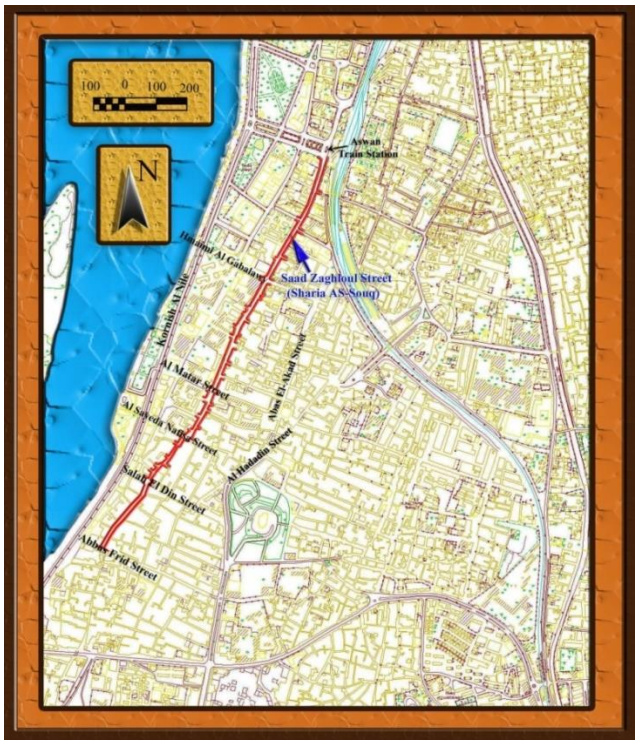

Figure 4.4 The central location of AS-Souq street at Aswan city, (By The Author).

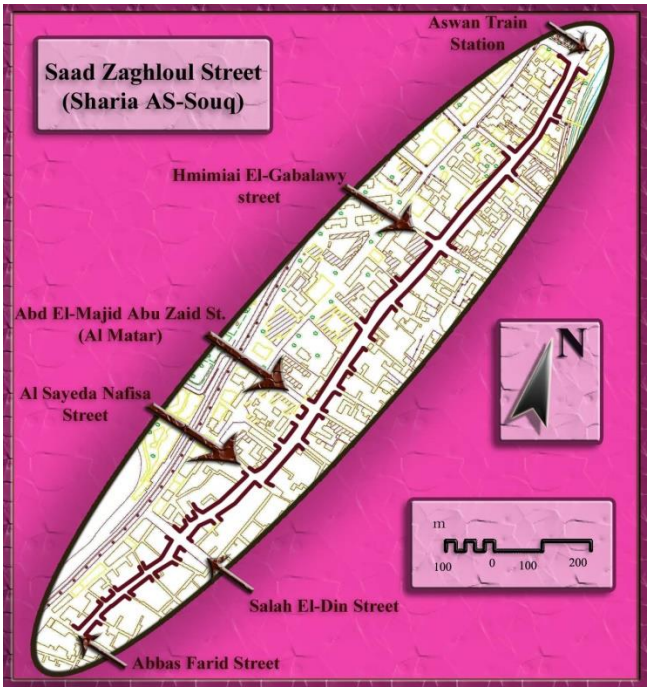

Figure 4.5 The intersecting streets with As-souq (Prepared by The Author).

Moreover, AS-Souq street extends along more than **1300 m**, and it provides various kinds of services and activities such as: “Commercial services” which appears in a huge

number of shops, “Tourist services” which represented in huge numbers of tourist shops and Pazar, “Educational services” which seen by a number of schools that located on this street, also lots of mixed services [115]. In 2004, and before the last urban regeneration, the width of AS-Souq street was between 8.7 meters and 22.8 meters, and reach to 4 meters in the sixth sector named “Ahmad Maher st.”, also, this difference in width caused a big problem for pedestrian and vehicles on street **Error! Bookmark not defined.**, see Figure 4.6.

Figure 4.6 AS-Souq street before the last urban regeneration, in 2004.

In 2006, the governor of Aswan issued an awesome decision No. (32) of the year (2006) for the street expansion, and the construction of a number of united shops in the second sector of the street, besides changing most of the street sectors to be for pedestrian only. Thus, urban regeneration of AS-Souq street was started from the date of issuing this decision [116], see Figure 4.7, Figure 4.8, and Figure 4.9.

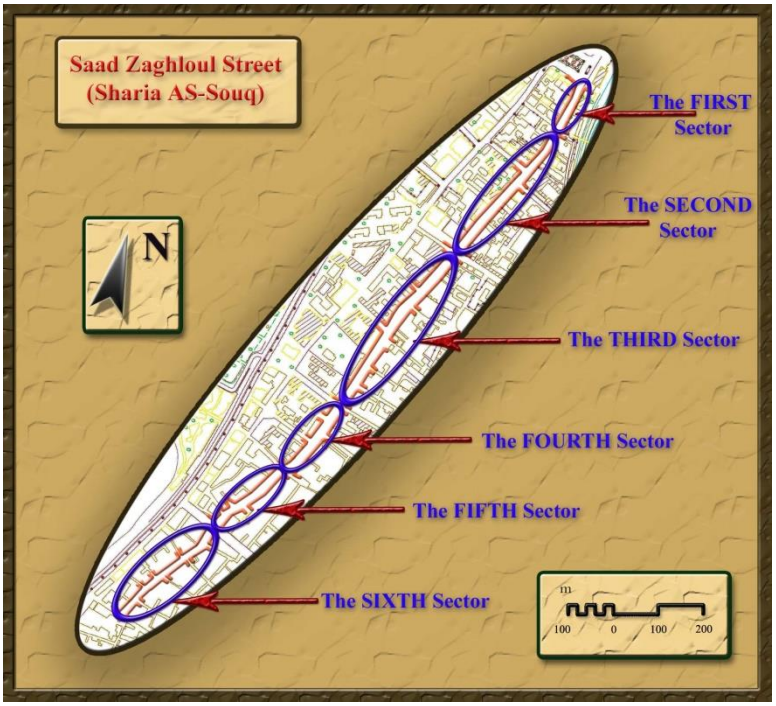

Figure 4.7 The six sectors of AS-Souq street after its urban regeneration in 2010, (Prepared by The Author).

Figure 4.8 The Fourth & the Second sector of AS-Souq street after the last improvement in 2010.

Figure 4.9 As-souq street after its improvement in 2010, (Taken by The Author).

In this regard, this dissertation confirmed that AS-Souq still has different problems which affect negatively on the street's users. Even though, AS-Souq is an essential and significant street at Aswan city, but, it is not qualified for all people especially "elderly, disabled and children".

By the practical part of this study which represented in "the case study: As-souq street", "survey questionnaire, interviews, and observations", we will put our hands on the deficiencies points and present problems on this street. Consequently, the study aspires to solve the street's problems in light of the "Universal Design Principles & its Concept", besides the qualities of "Public spaces". Also, this dissertation seeks to enable an inclusive street for all people regardless of the age and ability.

4.1.4 Aswan Governorate

Aswan is a city in Upper (southern) Egypt and the capital of Aswan Governorate. **Aswan** jewel of the Nile located about 899 km south of Cairo. Additionally, It is a

famous worldwide earned from its history and magic location which consider the Egypt's southern gate and characterized by its beautiful weather [117], see Figure 4.10. Clearly visible is the north-flowing River Nile, regarded as the longest River in the world passing through Aswan [118], see Figure 4.11. In addition to the population of Aswan governorate have reached (1,461,277 capita) based on the (9 -11-2015) census [119], see Figure 4.12.

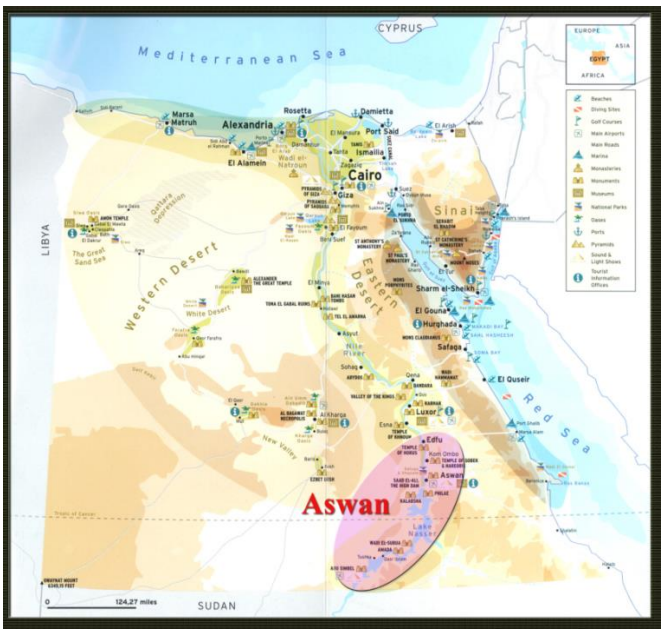

Figure 4.10 Aswan governorate's Location from The Arab Republic of Egypt [120]**.**

Figure 4.11 The River Nile at Aswan, Egypt [118].

Figure 4.12 A spatial map of Aswan governorate and its population (9-11-2015) census [119].

4.2 The Analysis Of The Field Study

In this part, the thesis explains the analysis of the survey questionnaire and its main idea.

4.2.1 Basic Idea Of The Questionnaire, Interviews And Observations

Great public spaces are those places where celebrations are held, social and economic exchanges occur, friends run into each other, and cultures mix. When theses spaces work well, they serve as the stage for our public lives [121]. Depending on **"Project For Public Spaces Organization** (**PPS**)" in evaluating thousands of public spaces around the world, “PPS” has found that to be successful, they generally share the following ***four qualities***: (**Access & Linkage, Comfort & Image, Uses & Activities,** and **Sociability**) [122]. Thus, the main idea of "the practical part of the study" was inspired by the **four qualities of public spaces,** see Figure 4.13.

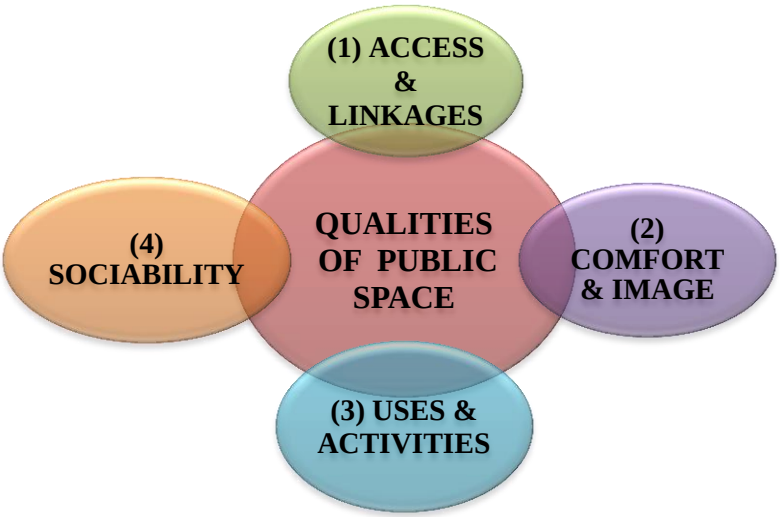

Figure 4.13 Four key qualities of public space [121].

First of all, the *survey questionnaire's idea* came from those **four qualities**: (Access & Linkage, Comfort & Image, Uses & Activities, and Sociability). "Each quality" is represented in "one section" of the questionnaire, beside the section of "*User Profile*" which displays the respondents' personal information. Also, "Each quality" includes relevant questions to "Universal design for streets and urban public space". A **copy of the *survey question*s is found In Appendix "B".**

Like the survey questionnaire, the questions of "*the interviews*" targeted the government official's and architects' view regarding the four main sections: **(**Access & Linkage, Comfort & Image, Uses & Activities, and Sociability). **A detailed list of the interviews' questions is given In Appendix "B"**.

In a similar manner, "*Direct observations*" which were prepared to depend on the street's vision at different times of the day, then recording the notes of what I watched, plus capturing photographs at various times of the day which supports the observations.

4.2.2 Analysis Of The Survey's Questions

A questionnaire was conducted with **330** persons: (**110** Visitor; **110** Shop owner; **110** Government Officials & Architect or Planner), see Figure 4.14.

Data sets of this questionnaire are structured to ***Four*** *section*s beside "*User Profile*" of respondents, as follows (**User Profile**; "**Section one**": Access & Linkages; "**Section two**": Comfort & Image; "**Section three**": Uses & Activities; and "**Section four**": Sociability).

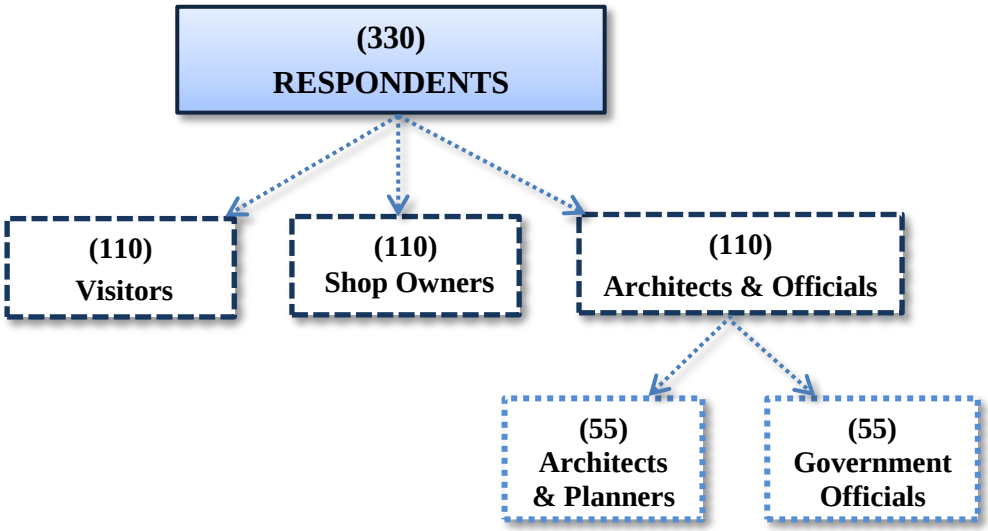

Figure 4.14 Distribution of the study's sample size.

The "**36** ***Questions***" of the survey questionnaire are subject to *four main sections/* sets, plus *Users Profile*s section. Each section includes different questions in order to achieve the study's goals. Furthermore, the survey questionnaire was divided into sections regarding: (At the beginning, **Users Profiles** were presented. Then, the first section is **Access & Linkage,** secondly**, Comfort & Image,** the third section is **Uses & Activities,** finally, **Sociability**). These sections were prepared as a result of my interpretation of the relationship between the "Four qualities of Public spaces" and "Seven principles of universal design" as mentioned above, see Figure 4.15.

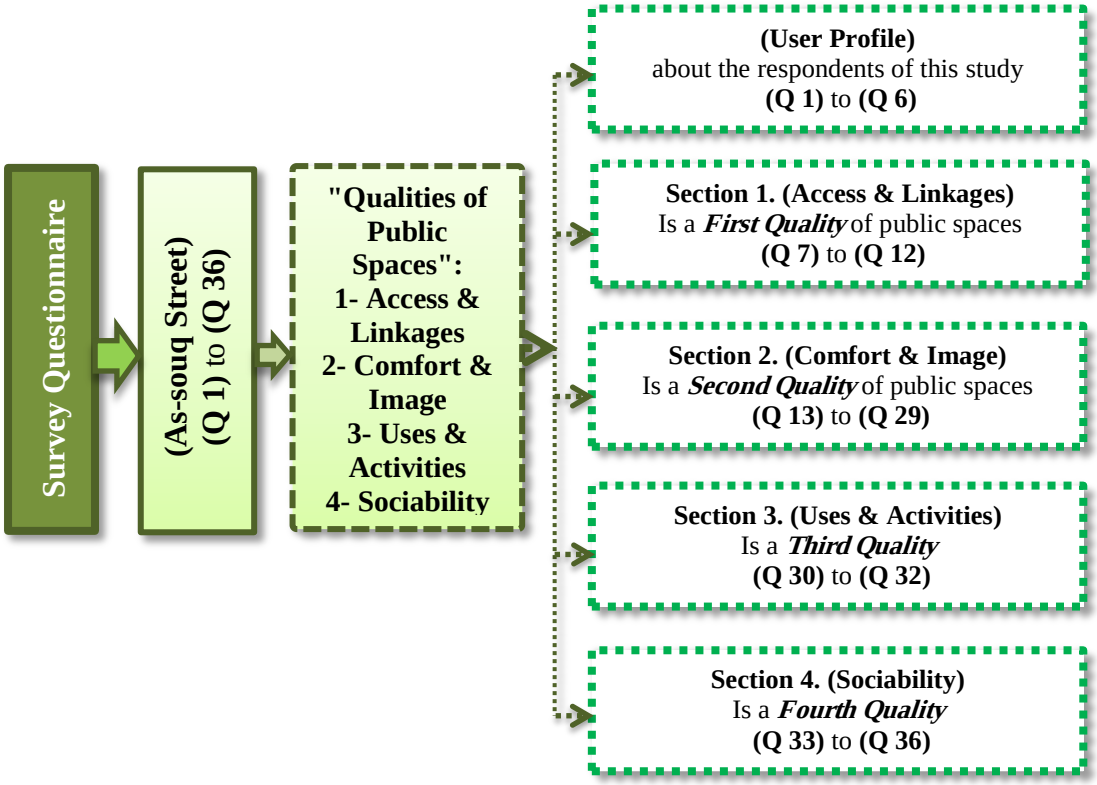

Figure 4.15 Organization of The Survey Questionnaire.

4.2.2.1 "User Profile"

User Profile of As-Souq street's respondents is the beginning of the questionnaire which included "**6 Questions**" asked to determine the socio-demographic characteristics of users who visit the street.

The User Profile of the recipients of the street contain (**Q1** Sex: Female or Male), (**Q2** User Type), (**Q3** Age group), (**Q4** Level of Education: none, Primary preparatory, Secondary, Undergraduate, Graduate, Postgraduate or PhD), (**Q5** Profession/ Occupation), and (**Q6** Physical Disability). See **Appendix B**: The **Survey Questionnaire**.

4.2.2.2 Section 1: "Access & Linkages"

In this section, questions were asked to judge the existence of the accessibility approach at AS-Souq street by its connections to its surroundings both visually and physically. Also, to grasp to what extent is easy to reach this street to and go through; besides to examine the street's vision from a distance and up close.

This part comprises of six questions which require responses about: "(**Q7**: the visibility of As-souq street from a distance), (**Q8**: the place which respondents coming from), (**Q9**: means of arrival to the street), (**Q10** & **Q11** Difficulties in reaching and entering AS-Souq), (**Q12**: travel time to the street)".

4.2.2.3 Section 2: "Comfort & Image"

This section of the survey questionnaire is targeted to recognize the importance of As-souq street for users, besides to understand whether the street is comfortable and has a good image, also to examine the accessible outdoor amenities which are available at As-souq. *Additionally*, this section includes **17 Questions** were asked to find out answers about "(**Q13**: A unique character and significance of As-souq); (**Q14**: The qualification of As-souq for all people); (**Q15**: the availability of places to sit); (**Q16**: The division of the street into six sectors); (**Q17**: Allocation most of the street's sections for pedestrian only); (**Q18**, **Q19**, **Q20**, and **Q21**: The availability of ramps for the urgent services' entry, accessible sidewalks, curb ramp, and public toilets); (**Q22** and **Q23**: Sence of safety and comfort, beside the security presence); (**Q24** and **Q25**: The availability of accessible Pedestrian Signals, and prominent landmarks); (**Q26**: The provision of parking spaces); (**Q27**: The visibility of the billboards through passing the street); (**Q28**: The sufficiency of lighting elements); and (**Q29**: The quality of floors materials)".

4.2.2.4 Section 3: "Uses & Activities"

The third section of the questionnaire composes of **three Questions** which were asked to figure out responses around "(**Q30**: Frequency of street's visit); (**Q31**: Spent time inside As-souq); and (**Q32**: The availability of species of activities)".

4.2.2.5 Section 4: "Sociability"

The primary aim of the fourth section is to evaluate a social side of As-souq street by recognizing the extent of users' satisfaction. When people see relatives, meet friends and interacting with strangers, they tend to feel a stronger sense of the street and types of social activities. This section includes ***four Questions*** were asked to find out answers about: "(**Q33**: Preference of As-souq street's visit); (**Q34**: Preference of walking with relatives and friends); (**Q35**: knowing/ recognizing people by "face or name"); and (**Q36**: Interaction with foreigners/ strangers)".

4.3 The Interviews' Responses & Direct Observation

4.3.1 The In-depth Interviews' Results

Interviews were carried out with government officials, Architects and planners at Aswan city for data collection. The questions of the interviews were prepared before interviews were conducted. The type of questions might be both closed and open-ended. A closed-ended question constitutes an answer that has a limited set of response categories. Whereas, an open-ended question is open to the interpretation of interviewee and may result in longer explanations.

The questions were asked during the meetings with the interviewees were about AS-Souq street to gather information that is more detailed and to clarify the importance of AS-Souq street as an urban public space, then, specifying whether the existence of universal design principles at this street or not.

In a similar fashion with the survey questionnaire, the questions of the interviews composed from four main sections: (Uses & activities, Comfort & image, Access & linkage, and Sociability). **In appendix C, the list of the interviews' questions was given**. *The interviews were conducted with government officials and architects of Aswan city in August and September 2015*. The questions intended to gather information about responsible persons' general perspective regarding the characteristics of AS-Souq street.

In this part, the study displays the views of the government officials, architects, and planners which were concluded by their responses about AS-Souq street. Based on "The **Four Sections**" of the interview, each question followed by its answer for the "**16 Questions** of the interviews".

4.3.1.1 Section 1. (Access & Linkages)

First of all, (Question 1) which was conducted with government officials and architects is represented in "(**Q1**) Would you describe AS-Souq street as an urban public space?". The interviewees definitely stated that AS-Souq is commercial, and tourist street at Aswan city.

As for "(**Q2**) Do you see this street as an **important public space** of consumption, shopping, and entertainment?". The interviewees affirmed the importance of the street,

especially, after the last urban regeneration which happened in 2002. Concerning "(**Q3**) Would you consider this street as **a major artery of Aswan city**?". They emphasized that AS-Souq is regarded one significant and basic artery of Aswan city owing to:

- AS-Souq street's distinctive location of the city.
- The existence of large numbers of trade shops, cafes, restaurants,..etc).
- The Variety of goods, services and activities.
- A familiar place to meet with friends and relatives as well.
- The sense of security of security and safe inside the street.
- AS-Souq street has climatic features due to: (the wooden pergolas, awnings, shops' shades, and a number of trees inside the street).

4.3.1.2 Section 2. (Comfort & Image)

When it comes to "(**Q4**) Are there enough seats at AS-Souq street? If no, why?", the interviewees confirmed the non-existence of sufficient seats, and they stated that there were a small number of benches just at the third sector of the street which was exploited by the street vendors owing to the insufficient campaigns of the municipality to follow the street. Moreover, they mentioned the difficulty of the existence of enough seats due to being a commercial street with two fully sides of shops. Consequently, there were no empty areas to fix new seats at AS-Souq.

With respect to "(**Q5**) Is the street qualified for all people of different ages and abilities? If No, why?", It is considered an essential question for this study which targets to understand whether AS-Souq street is eligible for all users or not. In this regard, the responses of the interviewees emphasized that AS-Souq lacks many basic items which help all users to benefit from the street easily such as:

- No ramps for the entry of the emergency vehicles to the street,
- No curb ramps when there is a level change,
- No yards to serve the street's users,
- Elderly, children and disabled people not taken into consideration during the design process of the street and its planning.

On the subject of "(**Q6**) What are the reasons for dividing the street into **six** sectors by number of gates?", the response of officials persons clarified the reasons for the street's division as follows:

- For security precautions
- One of the longest trade streets at Aswan city
- There are many intersecting streets with AS-Souq which allocated to vehicles, at the same time, these streets are vital and can not dispense with them.

Regarding "(**Q7**) Are there sidewalks or pedestrian paths in the different sections of the street? If no, why?", the interviewees' replied that there are sidewalks in some of AS-Souq's sectors, but, the various needs of all users not taken into account. Moreover, these sidewalks were exploited by shop owners and hawkers. They put the goods in front of their shops for their expansion which disturbs the street's visitors and lead to difficulty of movement inside AS-Souq. Besides, the various kinds of activities which happening inside the street's shops not taken into account while planning the street.

As for "(**Q8**) What is the reason in the allocation of most of the street sections for **pedestrian** only?" the interviewees' specified the reasons as follows:

- To facilitate the shopping process throughout AS-Souq street.
- To comfort tourists and locals as well from existing possible traffic jam inside the street
- For easy security control inside AS-Souq.
- It is a commercial street presents various species of activities and fields which benefit the whole residents

4.3.1.3 Section 3. (Uses & Activities)

This section started with "(**Q9**) What are the activities types that take place at AS-Souq street?" which targeted to recognize the various species of activities occurring at AS-Souq street. In this regard, the interviewees emphasized on the several activities which happening at this street such as Tourist trade: (tourist Bazaars which sell all the tourist goods). Furthermore, general trade: (shops for clothes, shoes, spices & herbs, perfumes, libraries,….etc). In other words, different kinds of activities occurring on the street in order to meet the various needs of family members and tourists as well. Additionally, the interviewees stated that all these activities are open to everybody as the aim of "(**Q10**) Are these activities open to everyone?".

With reference to one fundamental question regarding this study **("Q11**" Are there any obstacles which prevent an "Accessibility and Universal Design Approach" to be

existing at this street?). First of all, the officials mentioned that by law reviewing schemes should be done for each period of time, then re-planning, repairing which contrary to the users of the site/ place, but, this action is required to be completed. Secondly, no specialists have existed inside the legislative committees of local councils. Finally, the interviewees confirmed that the existence of "accessible pedestrian passes and sidewalks" not put into consideration.

On the subject of laws and legislations around "(**Q12**) Is there any plan such as some laws and legislations enabling all people with different abilities and ages to use the street easily and conveniently?". The government officials stated that there are no plans are scheduled for the current time, but maybe in the near future. As for "(**Q13**) Who is a responsible for putting into practice such these legislations?", the interviewees illustrated that a responsible for these legislations is ("The Specialized committees of popular local councils" which submit the proposals with "the executive devices", and then to "Governor of Aswan").

When it comes to the most significant question (**Q14**) (What are your suggestions to enable inclusive street for all people?), the interviewees' suggestions about AS-Souq street are exemplified in "Taking into account the provision of comprehensive street for all people by making some settings and qualifications which serve the whole users" as follows:

- The provision of ramps on the street's entries and curb ramps on the sidewalks. Besides, putting a wheelchair at the entrance each gate of AS-Souq not only to facilitate the patients' transition from the street to the hospitals easily but also to simplify the entry of ambulances, fire engine and security forces into the street.
- Re-planning AS-Souq street with taking into consideration the need of the shop owners by specifying sufficient spaces for the goods' display such as: (cafes, restaurants to put their tables and chairs,….etc) which leads to leaving the pedestrian sidewalks which were exploited by shop owners and street vendors.
- Re-arrangement the wooden pergolas to service as much as possible of users throughout the street.
- Providing sufficient seats and yards inside the street for all users.
- Placing the billboards of the trade shops noticeably for passers. Besides, preparing obvious signs for the orthogonal streets' names with AS-Souq in order to facilitate accessibility.

- Providing accessible signs to facilitate transition at the street, plus helping users which suffer from some physical problems such as: "vision, hearing, motion,...etc".
- Provision of basic street's furniture such as: (garbage boxes, fire engine, ...etc). Also, choosing an attractive and traditional style of the furniture to be remarkable and suitable for a tourist street.

4.3.1.4 Section 4. (Sociability)

With regard to "(**Q15**) Can residents help the government to achieve the goal? If yes? How?". The interviewees confirmed on the significant and vital role of locals in planning, designing, and development process, by the following:

- Participation in preparing the comprehensive plan for city's development and regeneration, then displaying this plan on the specialized technical committee of this development.
- Provide an opportunity for locals "visitors and shop owners" to give their positive opinions in the inclusive development process.
- Locals' cooperation by the Commitment of the government's rules, laws, and legislations.

Concerning "(**Q16**) Do architects and planners have a role beside the government and municipality for enabling an inclusive street for all people? If yes, How?". The government officials emphasized on the key role of architects & planners as follows:

- The specialized committees of local councils have a right to call the available experiences from inside and outside the governorate to provide assistance in designing and planning each service and developmental projects in order to serve the whole residents.
- Additionally, the specialized committees of local councils have a right to call interested people of designing and planning affairs, besides the efficiencies owners in order to display the proposals and developments in all categories of the society for enough period of time. Afterward, the discussion of these proposals starts with writing official minutes about the meetings. Consequently, the designing and planning process will be in harmony with the society desires.

4.3.2 Direct Observations

In the early stages of the study, I visited AS-Souq street at diverse times and spent time on this street. The observations of these stages were unfocused and general in scope. Yet, in the later stages of the research, I went to the street at varied days and different times of the day [before noon and afternoon, weekends and weekdays] in order to perform more focused notes. Those observations concerning with what I see, what I hear or what I feel,...etc. Consequently, I recorded the observations which include "Observations cards", "Videos", and "A clear description with Photographs" as a supplementary part of this dissertation which aspires to ("Evaluate AS-Souq street" in the light of "Universal Design principles" in an attempt to create and enable an *inclusive urban street* for all people").

The following observations were prepared according to "The Survey Questionnaire's Questions", and "The Particular Characteristics of AS-Souq street" which comprise a significant aspect of the practical study in carrying out this research. "Direct observations" were used as a "supplementary technique" alongside with the survey questionnaire and the in-depth interviews in order to:

- Describe problems as well as favored aspects defined by (Interviews with the "Government Officials" at Aswan governorate, Aswan Municipality, The District which follows AS-Souq street, and Decision-making committee).
- Give the illustrative dimension of the research.

In the same fashion, "The Direct Observations" of this dissertation were prepared depending on the *four main criteria* which were determined: (Access & Linkages, Comfort & Image, Uses & Activities, and Sociability), see Figure 4.16.

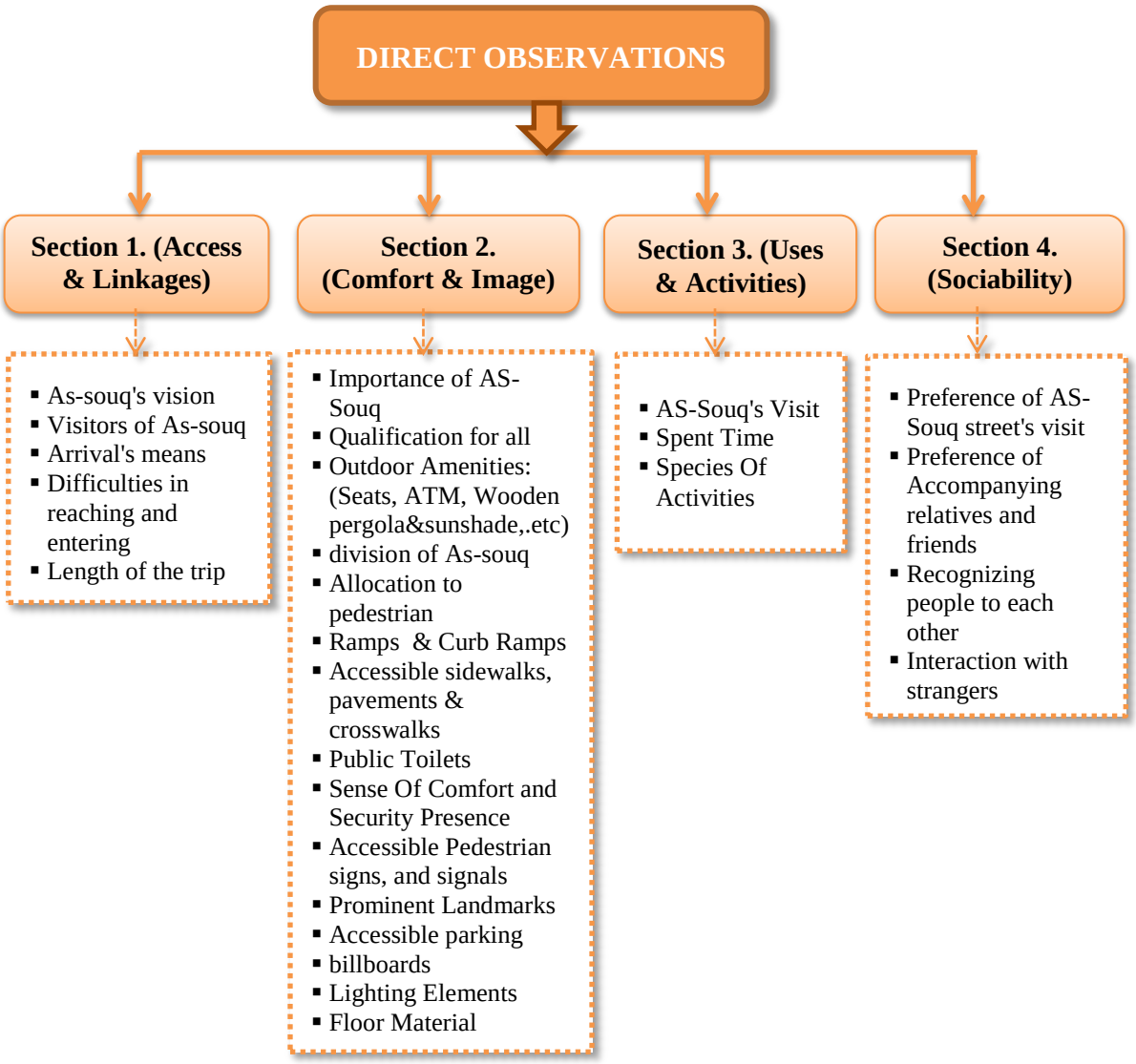

Figure 4.16 Organization of Direct Observations.

4.3.2.1 Section 1. (Access & Linkages)

❑ **AS-Souq Street's Visibility**

AS-Souq can be seen from a far distance, due to the distinguished and central location of this street in Aswan city center which connects "The Train Station Square" northward with "Abbas Farid Street" southward. Besides, the large length of AS-Souq led to its division into six sectors by diverse new gates which happened through the last urban regeneration which started in 2006, see Figure 4.17.

Figure 4.17 The distinguished location of AS-Souq street at Aswan city center, (Prepared by The Author).

❑ Visitors Of As-Souq & Arrival's Means

In Fact, visitors of the street varies to include not only the locals but also foreigners from the other governorates and main cities of Egypt and international tourists. Those visitors can arrive at AS-Souq by diverse kinds of transportation such as (bike, motorcycle, bus, minibus, private car, on foot,….etc). Indeed, most of the residents prefer going to this street "on foot" owing to its central site of Aswan city.

❑ The Difficulties In Reaching & Entering AS-Souq Street

In general, most of the street's visitors especially disabled and elderly face many obstacles in reaching and entering this street for the following reasons:

- There can be a traffic jam that causes difficulty in reaching to AS-Souq street.
- Close the street's entrances "Gates" by *steel chains* to prevent the vehicular access into the street, see Figure 4.18.
- The roads leading to AS-Souq are inaccessible, inconvenient and ineligible for all people.
- No parking spaces are existing through AS-Souq street which generates a big problem that represented in the congestion and overcrowding because of a random parking.
- The random parking of diverse species of transport besides the street's gates which result in impeding the pedestrians' movement and transition. Besides, lots of street vendors "hawkers" inside As-souq and next to the entrances, see Figure 4.19.
- The *street floor* is uncomfortable and ineligible well in some of the street's sectors. Also, the surfaces are unstable and slipping ones.
- There can be "*non-standard sidewalks*/*pavements*" in most sectors of AS-Souq street, but they were exploited by the shop owners and street vendors. Moreover, this occupation exceeds to reach to the middle of the street which leads to restricting the pedestrians' movement, see Figure 4.20.
- The street lacks the basic qualifications and types of equipment of disabled, urgent patients and elderly, besides, there is no "Emergency Vehicles Access". So, urgent patients suffer from this problem, and cannot be transferred easily from the street to the nearest hospital which maybe causes the death as happened one time before. Besides, the *long distance* between *the gate* and *the next one* at some sectors of AS-Souq creates some problems faced by street's users, see Figure 4.21.
- The *overcrowded street* which is inappropriate with its width and different species of activities, see Figure 4.22.

Figure 4.18 The steel chains which close the different gates of As-souq and disturbing street's visitors.


Figure 4.19 The random parking of diverse species of transport besides the street's gates, and Lots of hawkers inside AS-Souq and beside the entrances.


Figure 4.20 Sidewalks were exploited by the shop owners, and the shops' goods extended to the middle of the street which disturbing the whole visitors.

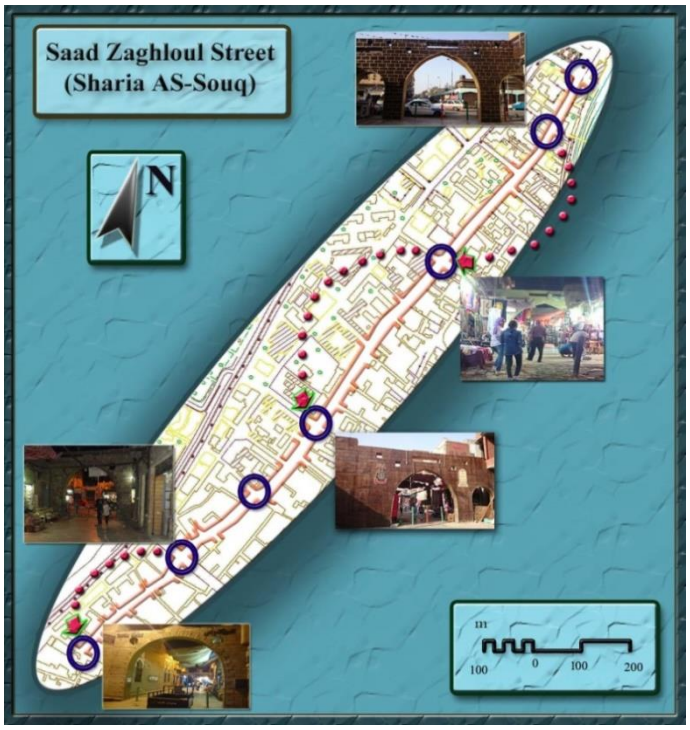

Figure 4.21 AS-Souq street's visitors suffer from the long distance between the gate and the next one at some sectors.


Figure 4.22 The overcrowded street in most of its sectors.

❑ **The Trip's Length To AS-Souq**

Due to the central and distinct location of AS-Souq at Aswan city, most of the street's visitors can reach easily in a short period of time.

4.3.2.2 Section 2. (Comfort & Image)

❑ **Character & importance of AS-Souq**

In a broader perspective, AS-Souq street has a unique character, distinguishing features and special style for the whole residents and tourists as well, which result in the feeling of your existence inside the historic city Aswan.

❑ **Qualification for all people**

AS-Souq street is *unqualified* and incompetent for all people of different ages and abilities, The ***obstacles*** which face The street's visitors have been illustrated extensively above in the item of (The difficulties in reaching and entering AS-Souq street). Regarding the available ***qualifications*** of As-souq, as follows:

Recently, the governorate, municipal and district which follows As-souq pay a great attention to the street services and interests which represented in:

- The frequent campaigns of *occupancies' remove* and hawkers from the street,
- Punishment *the outlaws* and legislations,
- Take a great care of the street,
- During the last August 2015, *new improvements* and modifications were being achieved within the different sectors of AS-Souq street such as (changing the street floors, the treatment of the pedestrian pavements, the gates, ...etc), see Figure 4.23.

Note: Although, the municipality and the district efforts for the removal of the occupancies and vendors from the street, they return back again after few days, so the problem still existing at the street.

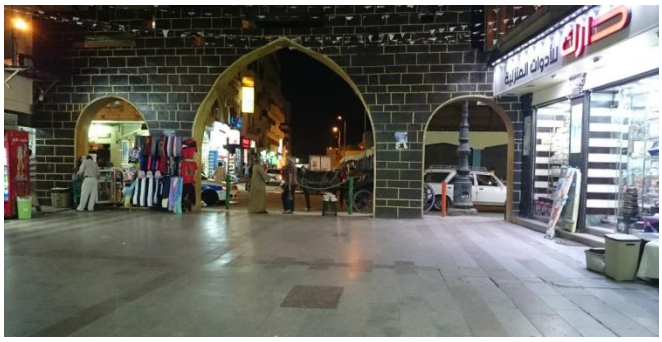

Figure 4.23 The new **floors** and the treatment of the existing **gates** at AS-Souq after the newest modifications, "August 2015", (Taken by The Author)

❑ **Outdoor Amenities: (Seats & Other Furniture):**

✓ **Benches and Seats**: As a matter of fact, so little number of seats are apparent and conveniently located in the third section of AS-Souq street, however, these benches are being used by the shop owners and street vendors "hawkers" not by the visitors. Consequently, all visitors do not feel of the existence of those seats.

✓ **Automated Teller Machines (ATM):** In spite of the two ATM machines which appear on the second sector and after the third part of AS-Souq street, but they are

inaccessible for all people with different abilities. Moreover, There is insufficient floor space adjacent to the ATM which impedes the wheelchair users and handicapped from approaching to the machine. Also, the street vendors put their goods on the pavement which the ATM machine is located on. Additionally, the operable parts "controls, buttons, deposit slots" can not be differentiated by sound or touch. *As a rational result*, all disabled people, elderly and children can not reach to or use those machines, see Figure 4.24.

- ✓ **Public Telephone & Mail Box:** Nowadays, the public telephone is unnecessary for most people, the self-phone increasingly decreases the use of the public one. Consequently, no public phones and mailbox are existing at AS-Souq street.
- ✓ **Recycling Bin:** There can be a lack of garbage bins and containers at most parts of the street, Also when they are existing, they are located inappropriately with a bad shape/style which unsuitable with the street's unique style.
- ✓ **Wooden pergolas and sunshades:** Generally speaking, AS-Souq street has many climatic advantages which represented in: (*Wooden pergolas*, *sunshades* and *street trees*). Most of the street is covered by ***sunshades*** that are made from cloth and textile. Besides, ***wooden pergolas*** which extend along most of the street's pavements. Moreover, the ***street's trees*** are apparent intensely in some sectors. Therefore, the street has unique climatic features and nice weather that encourage people to visit the street through the hot summer and the high temperatures, and that differs from the other streets at Aswan city. Consequently, the street is regarded as a favorable and desirable destination for all people, see Figure 4.25.
- ✓ **Fire extinguisher:** There is no fire extinguisher at the street which regarded as a serious problem at such one significant and commercial street.

Figure 4.24 The existing **seats**, and inaccessible **ATM** machines at AS-Souq street.

Figure 4.25 *Sunshades* that are made from cloth and textile; *wooden pergolas* which extend along most of the street's pavements; and the *street's trees* that are apparent intensely at the third sector.

❑ AS-Souq's Division Into "Six Sectors"

The last urban regeneration of AS-Souq resulted in dividing the street into "Six sectors" by a number of gates, see Figure 4.26. **On the one hand**, the division of this street is considered a very *useful idea* for **several purposes**:

- Facilitate walking freely within the street which owing to increase the shopping rate and raise the domestic economy.
- Enable local residents and tourists from enjoying their tour through the street sectors.
- Provide an aesthetic and civilized shape/ appearance for the street.
- Decrease the feel of bored.
- Contribute feeling safe and comfortable.
- Simplify reaching to the required place at the street.

On the other hand, dividing the street has an obvious disadvantage which represented in the difficulty of the entry of the urgent services and emergency vehicles into the street. For instance, "Ambulance, Fire engine, Police and Security forces". Moreover, the difficulty of maintenance works on the street such as "Networks, Sewage, Water,..etc".

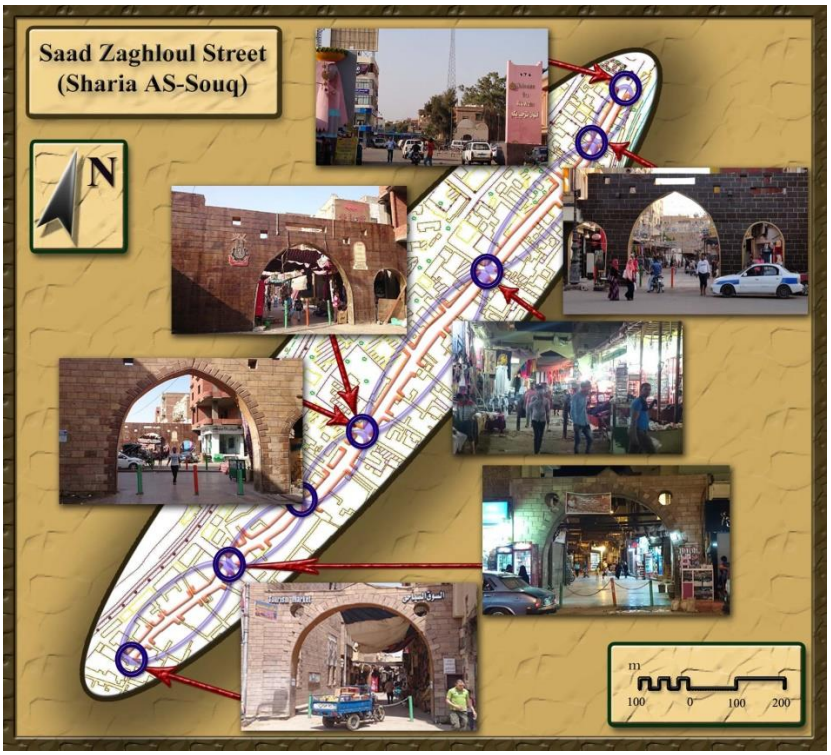

Figure 4.26 The division of AS-Souq street by several gates, (Prepared by The Author).

❑ The Street's Allocation To Pedestrian Only

Allocation most of AS-Souq's sectors just for pedestrian has many advantages as follows:

- Support many *activities* especially *tourism* sector at the street.
- Simplify the *movement* and *transition* through the street, see Figure 4.27.
- Encouraging visitors to *walk freely* and spent a nice time in the street.
- Achieving a great *safety* and *security* for all people of different ages through the street.

Nevertheless, the municipality, governorate, and Aswan city council should overcome one of the most real problems which are that the urgent cases of patients in this street could not be easily transferred to the nearest the hospital., besides, the hardship of the emergency vehicles access into the street".

Figure 4.27 The third sector of AS-souq which allocating to pedestrian only.

- **Ramps For Urgent Services' Entry & Curb Ramps**

Although, *no standard ramps* at the entrances of the street's sectors "gates", but *manual* one appears at the entrance and exit of the second section only. Furthermore, there are many **obstacles** should be removed at the different gates of the street such as:

- A *raised threshold* and level change at the gate of the fourth sector of AS-Souq which restricts passing the street by disabled, elderly and children. This threshold should be beveled with a suitable slope, see Figure 4.28.
- Various species of *transports* besides most of the street-gates which disturb and irritate visitors totally.
- The street vendors at the beginning of each gate at the street.

As for the existence of curb ramp when changing levels. Never had I seen curb ramp at AS-Souq street before.

- **Accessible sidewalks, Pavements & Crosswalks**

Despite, the *first sector* of AS-Souq is allocated to both pedestrian and vehicle, however, no standard sidewalks/ pavements are existing there. There can be just narrow pavements at both sides of the same sector, but people can not use those pavements due to "the random parking, street vendors, recycle container and discontinuous pavements, beside the exploitation/ utilization of these sidewalks by the shop owners". In the same fashion, there can be some *inaccessible* and unqualified *pavements*/ sidewalks at *most sectors* of AS-Souq street, however, not all people can benefit from, due to "The shop owners and street vendors are exploiting these pavements and their occupation extends

to reach to the middle of the roadway. Besides, those pavements are not equipped for all people with different ages and abilities".

Furthermore, *no crosswalks* at "The intersecting streets" with AS-Souq. Besides, *no traffic signs* at these streets to regulate the pedestrian transition from any sector to the next one safely.


Figure 4.28 (Left photo): A manual ramp appears at the entrance of the second sector of AS-Souq. (Right photo), a raised threshold at the fourth sector's gate.

❑ Public Toilets

One public toilet is existing in the third sector of AS-Souq street. It comprises of two rooms, one for men and the other for women, however, it is not enough for all the street's visitors. Moreover, this toilet is inaccessible and inappropriate for all people with different ages and abilities. Additionally, there is an accessible sign indicates to the location of the toilet, see Figure 4.29.


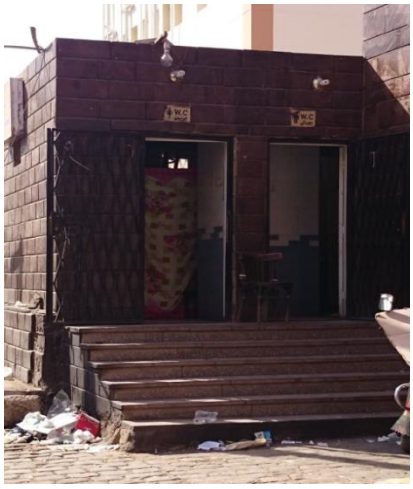

Figure 4.29 The *sidewalks* were exploited by the shop owners at the ***first sector*** which allocated to both ***vehicle & pedestrian***; also the existing *public toilet* at the street.

- **Sense Of Comfort & Safety, And Security Presence**

Although a security presence appears just at one point along the whole street, specifically beside the gate of the fourth sector of AS-Souq, but most visitors feel secure, safe and comfortable without noticing this security presence.

- **Accessible Pedestrian signs & signals**

By examining the whole street, I found out that there are *no visible* or *audible signals* indicate the direction of travel "left or right". Furthermore, there is just *four accessible signs*/ signage along the whole street. The first sign is located beside the public toilet. The second one is existing at the end of the street which refers to "Tourism Market", see Figure 4.30. As for the third and fourth signs are located in the station square which considered the start point of AS-Souq street, see Figure 4.31.

These signage are inadequate totally for the whole street, and it should be placed in an appropriate location throughout AS-Souq. Additionally, no exterior signage are available along the street that provides directions to the accessible routes and entrances.

In a broader context, every space/part of the street should be designated with several signs to help all people regardless their ages and abilities to reach the desired place without the need to help or explanation. Furthermore, all those signs should have a good contrast between characters and background, besides taking into account the appropriate size of characters.

As a consequence, AS-Souq street lacks such those accessible signs which facilitate the visitors' transition from and to anywhere.

Figure 4.30 First sign beside a public toilet, the second sign is at the end of As-souq street.

Figure 4.31 Third and fourth sign are located in the station square

- **Prominent Landmarks**

AS-Souq street has abundant of prominent landmarks from its beginning to the end such as (Train station, artworks especially on walls, statues, and gates with a traditional and unique style), see Figure 4.32.

Figure 4.32 The first gate of AS-Souq which includes a traditional and unique artwork that referring to Aswan's style, besides the written sentence "Welcome To Aswan".

- **Accessible Parking Spaces**

No accessible parking spaces are located in AS-Souq street. Besides, all visitors maneuvering to find a random space alongside with the street gates/ entrances to parking their own transports. This act generates a serious problem which represented in "The overcrowding and strangulation". Consequently, a great difficulty is being generated in entering and exiting from the street. Moreover, those random parking spaces are not designated with a sign showing the International Symbol of Accessibility.

❑ Billboards

AS-Souq abounds of the billboards which display advertisements about (shop, tourist bazaar, hospital, medical clinic, pharmacy, cafeteria, and hotel,...etc). Indeed, some of those billboards can be appeared clearly through passing the street, whereas, the other ones unobserved at all for the following reasons:

- The improper and unsuitable location which billboards are placed on, see Figure 4.33.
- Sometimes, lack of using the high-quality materials which impact on the appearance of the billboards.
- The accessible billboards should have a good contrast between characters and background, also adequate character size for viewing distance.
- The weather condition affects negatively on most of the street billboards such as (The high temperature at Aswan city which change the color, shape and the quality of those billboards).

Figure 4.33 The billboard of the shop's name could not appear clearly through passing AS-Souq due to wooden pergolas. Whereas, the other billboard could seem obvious.

❑ Lighting Columns

There are an adequate number of lighting elements along AS-Souq street, but, some sectors suffer from the darkness and depending on the lighting units of their own shops, while, the other sectors are illuminating completely. The reason of this problem is represented in closing the lighting elements all the day in most sectors and the other ones need maintenance and repair, see Figure 4.34.

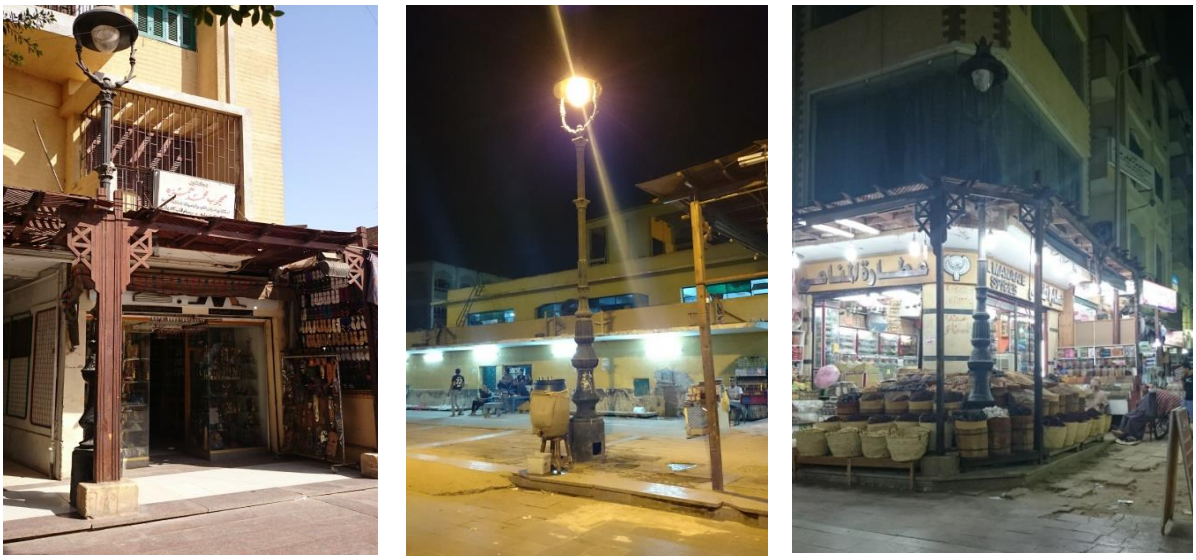

Figure 4.34 The lighting columns in different times of the day and from different sectors.

- **Floor Materials**

Along the street's sectors, the floor materials vary from Granite and Sandstone. Even Though, the ground substances in some sectors are firm, stable, slip resistance and convenient. On the contrary, the other sectors are suffering from inappropriate materials which are unstable, slipping and inconvenient for all visitors, plus some problems which need to repair and maintenance, see Figure 4.35.

Figure 4.35 The street's floors are uncomfortable, unstable and slipping in some of its sectors.

4.3.2.3 Section 3. "Uses & Activities"

- **As-souq Street's Visit, A Spent Time, and Species Of Activities**

By exploring the street's visitors whether domestic inhabitants or foreigners. I found out that most people travel to AS-Souq street daily owing to its central and prominent location from Aswan city. Additionally, the street links between the city's north with its

south. Also, people spend more than one hour during their visit due to the several types of activities which are occurring at this street such as (work, home, shopping, Eating, Walking, Entertainment, Meeting with others, and visit a physician/doctor,.... etc).

4.3.2.4 Section 4. "Sociability"

- **Preference of AS-Souq's visit**

In general, all visitors prefer travelling to AS-Souq for many purposes, I mention the common ones, as follows (Its distinct location; Existence of shops; Cafes and restaurants; Variety of goods; Services & activities; Climatic advantages; Sense of security & safe, and Meeting people each others**),** see Figure 4.36.

Figure 4.36 The street abounds of cafes which considered a preferable place for the men visitors, also Shopping is a popular activity for most of AS-Souq's visitors.

- **Preference of Accompanying relatives & friends, and Interaction With Strangers**

The majority of locals prefer going to As-souq with their relatives and friends which confirm the great social relationships occurring at this street and its sustainability, also emphasizes their sense of security and safety through the street's visit. Besides, people at AS-Souq street seem to know each other easily by face or name, and they can interact with the foreigners Spontaneously.

4.4 Results Of Statistical Analysis of Survey Questionnaire

In this part, the study examines and analyzes results of survey questionnaire statistically by using (**SPSS**) program "***Statistical Package for the Social Sciences***". Prevalent statistical techniques such as "*descriptive statistics*", "*cross-tabulation*", "*Chi-Square tests*" and "*One-sample t-tests*" have been used to examine the data collected from the questionnaire. I used an alpha level of (0.05) for all statistical tests (95% confidence interval).

Chi-Square is a non-parametric statistical technique, used primarily with nominal or categorical data such as (Identity, profession, and gender,..etc). It is important to determine whether you are doing a ("Chi-square test Goodness of Fit" which also known by "*The one-way chi-square*" and "The simple chi-square") or a (*Test of Independence*). The word "Independent" means that there is no association/ relation between two attributes. In other words, the attributes for example between "A and B" are independent.

"*The one-way chi-square*" means that there is one variable with 2 or more connected categories and a participant may fall into one of them (e.g. "Walking", "Shopping", Eating", or "Entertainment/ Fun"). "Test of Independence" means that there are two variables with 2 or more categories in each (e.g. "preference of visit", or "spent time" rely on gender, Female or Male).

In short, *the* x^2 *analysis* displays the differences and relationships. As for the results, significant relations are presented in detail with cross-tabulation tables.

"*Cross-Tabulation*" is the simplest technique for understanding patterns/ models of differences between populations/ respondents in a database. Moreover, Cross-Tabulations is an example of bivariate analysis e.g. examining the association between two variables such as "Preference of visit" and "gender"; or "Difficulties in entering" and "physical disabilities",...etc.

The survey findings reported below are based on ***two phases*** of analysis. In the ***first phase***, the sample was collected from As-souq street was analyzed and the statistical analysis of the questionnaire's questions was carried out "individually". In this step of descriptive statistics, each variable (Q1 to Q36) was analyzed one after the other according to the qualities of urban public space which the survey's questions depended on.

As for the ***second phase***, the sample was gathered from As-souq street too, and the statistical analysis of the survey's questions was done "comparatively". This phase divided into **two parts**, see ***Figure 4.****37*. In the ***first part*** of **this phase**, the relationship and differences were illustrated by (Chi-Square Test), see ***Figure 4.38***. This dissertation poses that there are associations between some variables "Questions" each other. In this context, the results of this evaluation are as follows: These *questions were chosen* to *locate and find answers for the key research questions* of this dissertation. **"The cross tabulation" were given after the own illustration, while "the chi-square test's tables" were attached in Appendix A**. ***Secondly***, the relationship and differences were clarified by (One-Sample T-Test), see ***Figure 4.39*** The "One-Sample T-Tests" were conducted for the questions which ask about the extent of satisfaction of As-souq's users. **The clarification** and **evaluation results of the "One-Sample T-Tests" were attached in Appendix A**, and conducted for the following *four questions* (As-souq's visit is preferable for you "**Q33**"; Walking with relatives & friends is a desirable activity "**Q34**"; Knowing people by face or name is spontaneously happened "**Q35**"; and Interaction with strangers is done easily "**Q36**"). The main goal of this test is to understand the extent of satisfaction of As-souq's users about those mentioned questions.

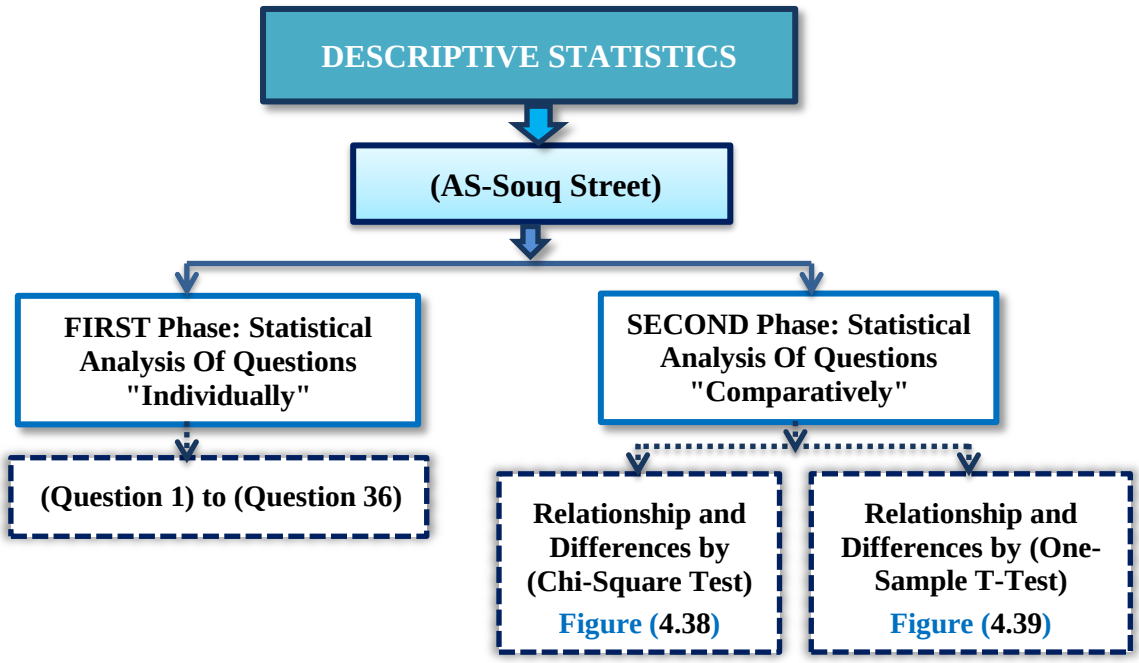

Figure 4.37 Phases of Descriptive Statistics of this study (The Author).

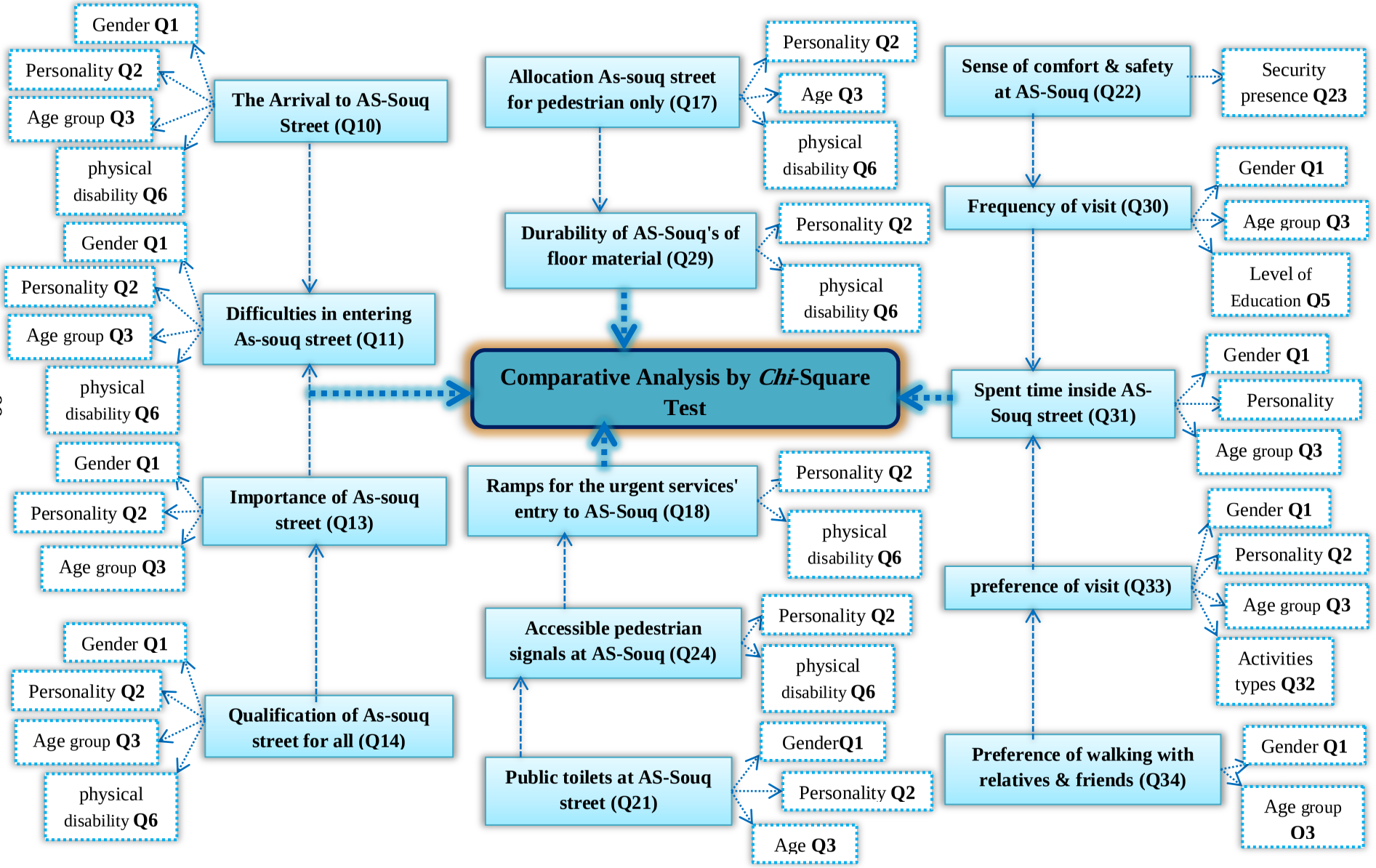

Figure 4.38 Comparative Analysis by *Chi*-Square Test (The Author).

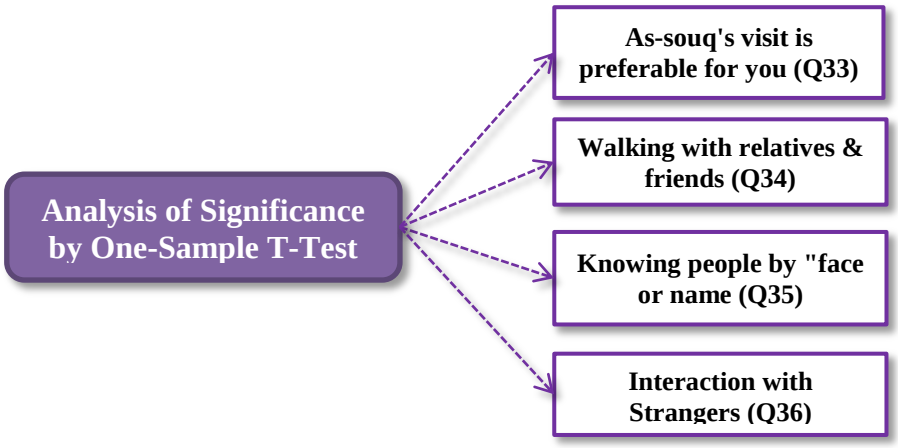

Figure 4.39 Comparative analysis by "One-Sample T-Test" (The Author).

4.4.1 The First Phase of "Statistical Analysis Of Questions Individually" by (SPSS)

In this part, the study discusses the statistical analysis of the 36 questions of the survey questionnaire individually.

4.4.1.1 User Profile (Questions 1 to 6)

This demographic part of the questionnaire consists of 6 Questions explain basic information about (gender, identity, age, level of education, occupation, and physical disability). Depending on data collected (**Q1**), more than half (78.5%) of respondents of "*Sharia as-Souq*" or "*AS-Souq street*" were male and (21.5%) female. Respondents were distributed equally by **3** ***identities***: ("Visitors", "Shop owners", and "Architects plus government officials"), each personality includes **110** respondents out of the total number of the sample.

The sample's respondents tended to be relatively young. The "median age" of the respondents of AS-Souq was (2) which referred to (**25** to **40 years old**) that represented almost a half (**44.5**%) from the whole sample. The rest half of the respondents were 40 to 65 (38.2%), 10 to 25 (10.9%), and over than 65 (6.4%).

Level of education data shows that 1.8% of the respondents had no education degree (uneducated), 2.1% had a primary school degree, 6.1% had a preparatory school degree, 22.1% had a secondary school degree, 3.6% will have some college degrees (they were undergraduate students), more than half (**54.8**%) of respondents had ***graduate degrees***,

7.6% had postgraduate degrees, and 1.8% had Ph.D. degrees. The data are graphed in Figure 4.40 below.

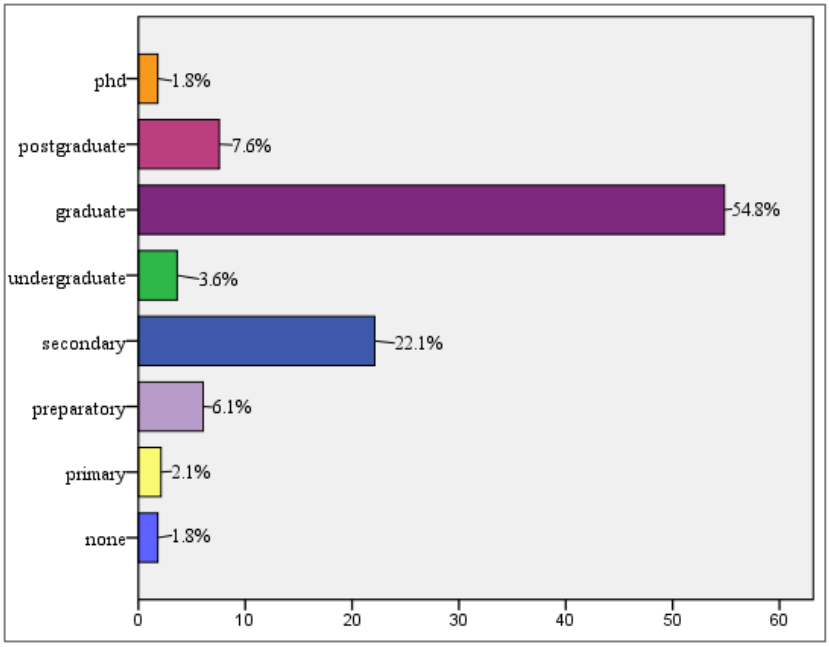

Figure 4.40 The valid percent of the level of education (**Q4**)

The sample of the study included a different kind of *occupations* which were classified in the main categories of professions. In Figure 4.41, profession data shows that 15.5% of respondents were employees, 4.2% were students, the highest percent of the respondents (38.2%) were self-employed, 2.4% were professionals, 3.9% were housewives, 2.4% retired/ unemployed, (16.7%) were architects/ planners, 16.7% were government officials.

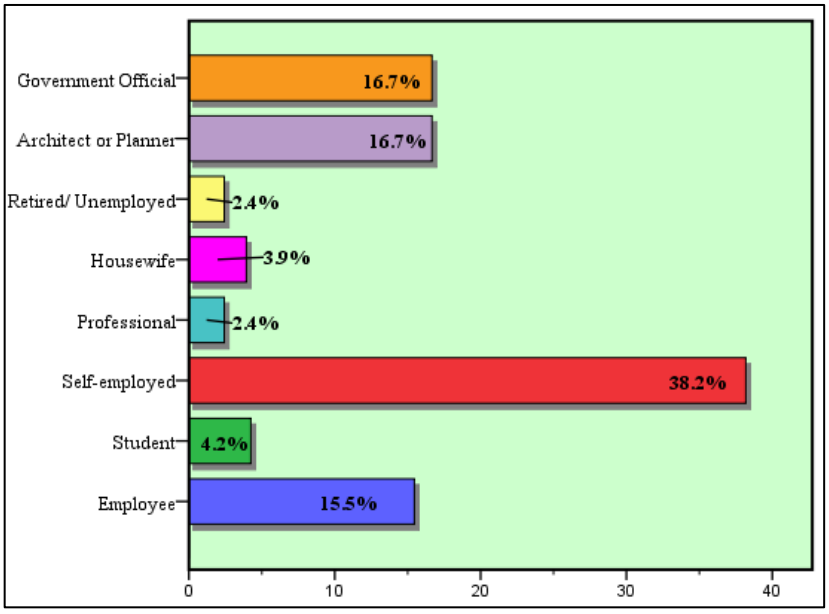

Figure 4.41 The valid percent of Profession distribution (**Q5**)

When it comes to "*Physical Disabilities*", (87.3%) of respondents had no physical disabilities, while 12.7% had physical disabilities, the data graphed in Figure 4.42 below. Regarding *the disability kind*, 26.2% of respondents had hearing disabilities, (33.3%) had vision problems, 19% had motion problems, 11.9% were disabled/ handicapped totally, 2.4% had amputated the arm, and 7.1% had infantile paralysis, see Table 4.1.

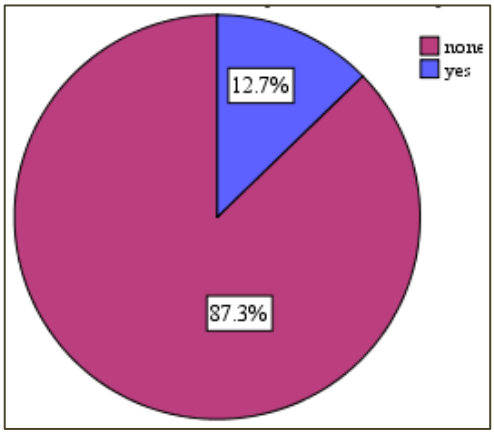

Figure 4.42 Clarifying respondents' number who had physical disabilities (**Q6**).

Table 4.1 Disability types distribution of AS-Souq street‘s Respondents (**Q**6)

Disability Kind		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hearing	11	3.3	26.2	26.2
	Vision	14	4.2	33.3	59.5
	Motion	8	2.4	19.0	78.6
	Disabled or handicapped	5	1.5	11.9	90.5
	Amputated arm	1	.3	2.4	92.9
	Infantile paralysis	3	.9	7.1	100.0
	Total	42	12.7	100.0	
Missing	X	288	87.3		
Total		330	100.0		

4.4.1.2 Section 1: Access & Linkages (Questions 7 to 12)

This section focuses on the criterion "Access and linkage to various activities at AS-Souq street" via the evaluation of responses to questions 7 to 12. **Q7** (Can you see AS-Souq street from a distance?), **Q8** (From which district or city did you come to the

street?), **Q9** (How did you arrive at the street?), **Q10** ("Did you arrive to the street easily?" and If yes "What are the difficulties in reaching the street?"), **Q11** (Do you confront any difficulties in entering the street?), and **Q12** (How long did your trip take? "in minutes"). **Based on** data collected more than half (59.1%) of respondents of "Sharia as-Souq"/ "AS-Souq street" stated that they can see the street from a distance, see Table 4.2. when it comes to the city/ district which respondents are coming from, (93.7%) of respondents came from Aswan city itself and its villages, see Table 4.3.

Table 4.2 The valid percent of respondents for AS-Souq street‘s vision (**Q7**)

Can you see AS-Souq from a distance?		Frequency	Valid Percent	Cumulative Percent
Valid	No	135	40.9	40.9
	Yes	195	59.1	100.0
	Total	330	100.0	

Table 4.3 The city/ district which respondents of AS-Souq street are coming from (**Q8**)

From which city did you come to the street?		Frequency	Valid Percent
Valid	Aswan and its valleges	309	93.6
	Outside of Aswan (Cairo, Menia, Sohage,..)	21	6.4
	Total	330	100.0

Regarding the respondents' arrival to the street by transport, almost half of respondents (49.1%) came to AS-Souq street on foot, 19.4% of respondents came by private car, 4.2% of respondents came by bike/ motorcycle, 27.3% of respondents came by mass transportation, see Table 4.4. As for kind of "Mass transport", 11.1% of respondents came by bus, (68.9%) of respondents came by minibus, 16.7% of respondents came by taxi, 2.2% of respondents came by train, 1.1% of respondents came by boat/sailboat, see Figure 4.43.

Table 4.4 The respondents' arrival to the street by transport (**Q9**)

How did you arrive at the street?		Frequency	Valid Percent
Valid	On foot	162	49.1
	Private car	64	19.4
	Bike or motorcycle	14	4.2
	Mass transport	90	27.3
	Total	330	100.0

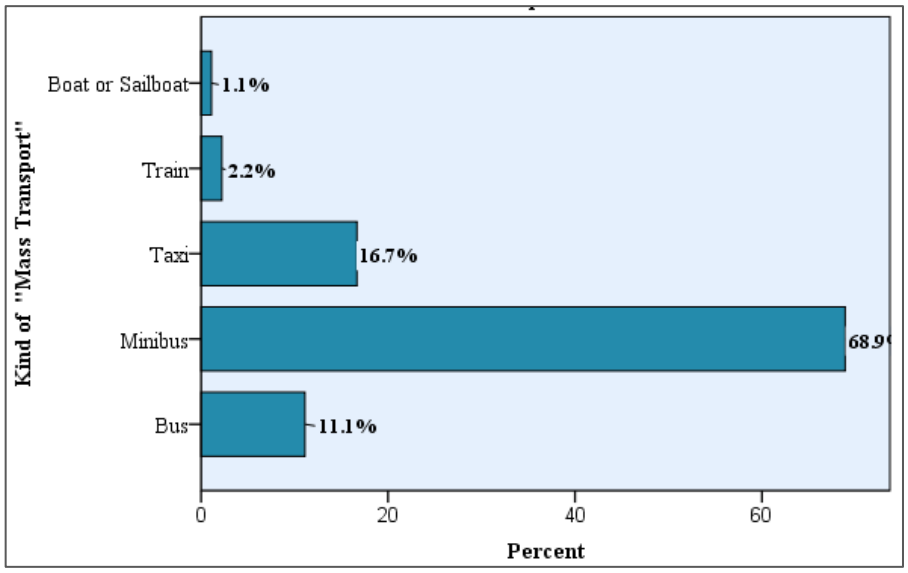

Figure 4.43 The valid percent of respondents who used kinds of mass transport (**Q9**)

With regard to (**Q10**), the data in Table 4.5 showed that (61.52%) of respondents of AS-Souq street mentioned that they did not arrive easily to the street while 38.48% arrived easily. For the *difficulties in reaching* to this street, 12.3% of respondents stated that no pedestrian crossing close to the street, 3.4% of respondents mentioned that there are no bus stops close to the street, 18.2% of respondents emphasized that sidewalks are not good enough or not existing, 8.4% of respondents stated that there are no pedestrian paths available, (21.7%) of respondents affirmed that the street floors are not qualified well, 4.9% of respondents specified that there are physical disabilities, 7.9% of respondents told traffic jam, 15.3% of respondents inconvenient roads, 5.4% of respondents said insufficient parking, 2.5% of respondents mentioned that waiting period for buses or minibuses, see Figure 4.44.

Table 4.5 Respondents' percent who arrived easily to AS-Souq street (**Q10**)

Did you arrive at the street easily?		**Frequency**	**Valid Percent**
Valid	No	203	61.5
	Yes	127	38.5
	Total	330	100.0

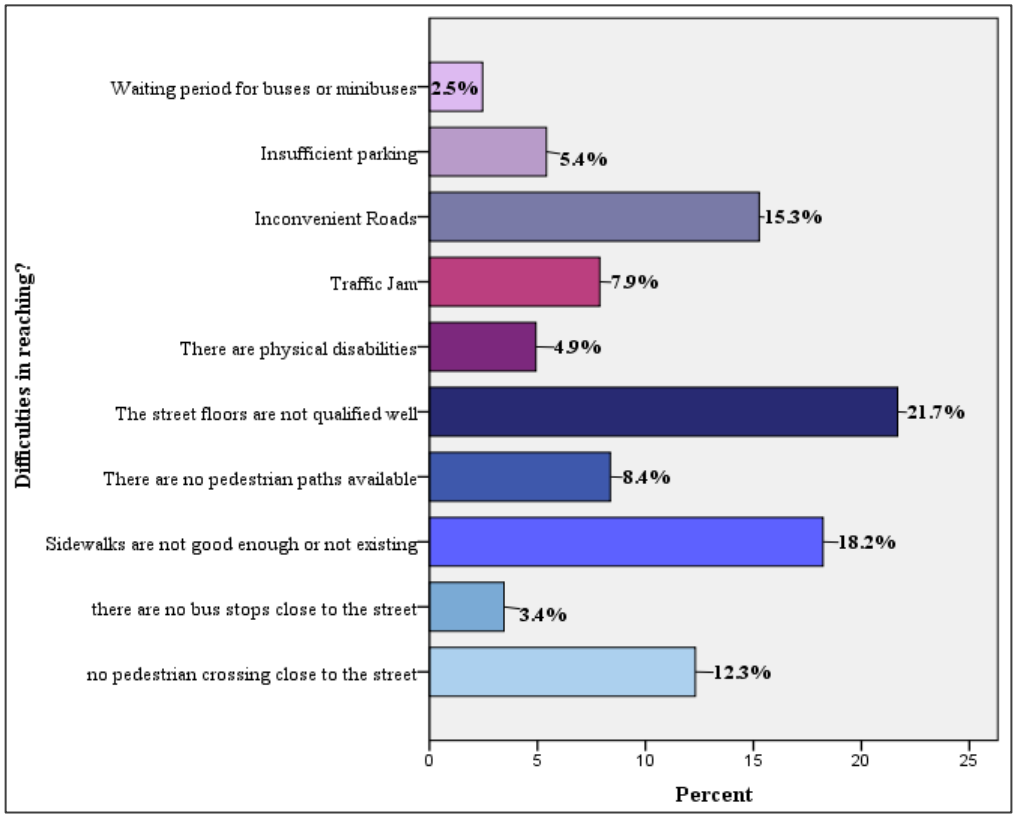

Figure 4.44 The valid percent of difficulties in reaching to AS-Souq street (**Q10**)

As for the difficulties which confront the respondents when entering the street (**Q11**), more than a half of respondents (55.5%) faced some difficulties in entering the street, while 44.5% of respondents did not face any difficulties, see Table 4.6.

Since (**Q12**) was an open-ended question, the analysis was based on a preset categorization of answers depending on the original respondents' responses. As can be seen from Figure 4.45 below, more than half (53%) of respondents their trip to AS-Souq street took "from 5 to 15 minutes". 31.5% of respondents took "from 15 to 30 minutes ", 11.8% of respondents took "from 30 minutes to 1 hour", and 3.6% of respondents took "from 1 hour to 2 hours".

Table 4.6 Respondents' percent who are facing difficulties in entering the street (**Q11**)

Facing difficulties in entering the street		**Frequency**	**Valid Percent**
Valid	No	147	44.5
	Yes	183	55.5
	Total	330	100.0

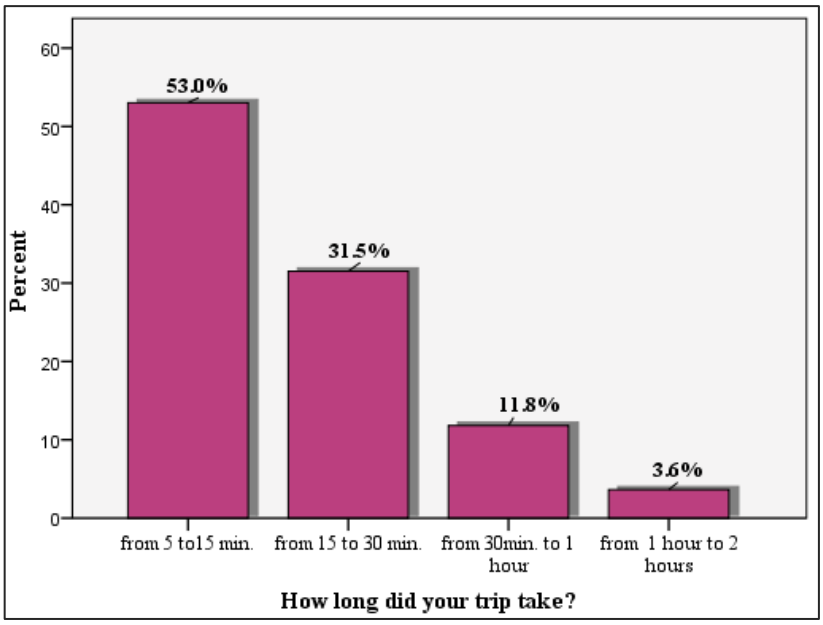

Figure 4.45 Respondents' percent regarding the length of the trip to AS-Souq street (**Q12**)

4.4.1.3 Section 2: Comfort & Image (Questions 13 to 29)

This section focuses on the criterion "Comfort and good image" via the evaluation of responses of questions 13 to 23. **Q13** (Do you feel that AS-Souq street has a unique character & special importance for residents and tourists as well? and Do you feel that you are in Aswan when you are in?), **Q14** (Is the street qualified for all people of different ages and abilities?), **Q15** (Are there enough places to sit at the street? If yes, Are seats conveniently located?), **Q16** (Do you agree with dividing the street into "Six sectors" by number of new gates?), **Q17** (Do you agree with allocating most of the street sections for pedestrian only?), **Q18** (Are there ramps for the entry of urgent services to the street: "Ambulance, fire-engine and security forces"?), **Q19** (Are there accessible sidewalks support the diverse needs of people of all abilities?), **Q20** (Are there Curb ramps provided when there is a level difference?), **Q21** (Are there public toilets in most sectors of the street? If yes, Do they consider the needs of all users of different ages and abilities?), **Q22** (Do you feel comfortable and safe at the street?), **Q23** (Is there a security presence?), **Q24** (Are there Accessible Pedestrian Signals and signage at this street?), **Q25** (Are there any prominent landmarks to remember the street and its location? If, yes, mention it), **Q26** (Are "parking spaces" provided at the street? If yes, Do they consider the needs of all car users?), **Q27** (Do you clearly notice the

billboards through passing the street?), **Q28** (Are there sufficient Lighting Elements at the street?), and **Q29** (Do you feel that "The Floor Material" of the street are safe and durable?).

When it comes to "A unique character of AS-Souq street" (**Q13**). The overwhelming majority (96.36%) of respondents confirmed on a unique character and special importance of this street for them and tourists as well. Additionally, (95.15%) of respondents feel that they are in Aswan city when they are in AS-Souq street. The data are graphed in Figure 4.46 and Figure 4.47 below.

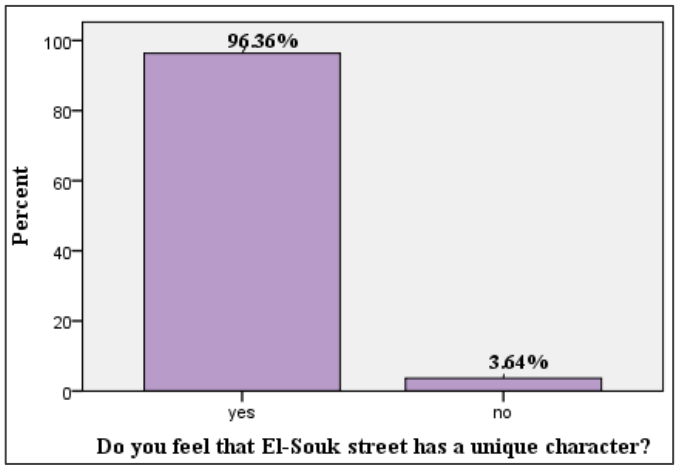

Figure 4.46 Respondents' sense towards a unique character of AS-Souq street (**Q13**)

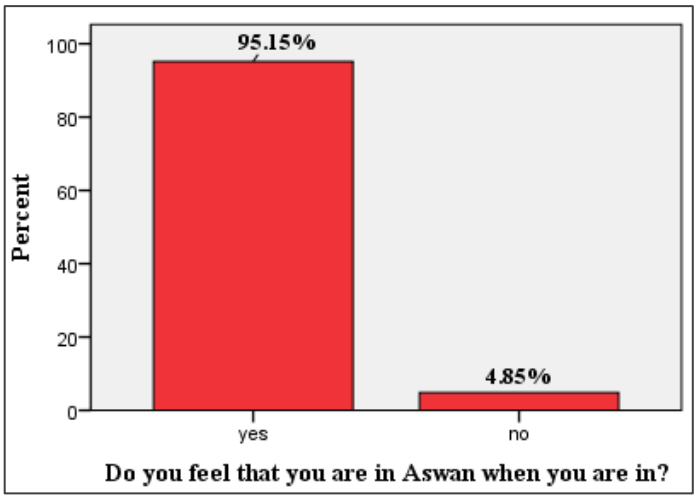

Figure 4.47 Respondents' feeling of Aswan city while their existence inside AS-Souq street (**Q13**).

Concerning qualification of AS-Souq street for all people of different ages and abilities (**Q14**), the data distribution showed that (86.4%) of respondents affirmed that the street was not qualified for all people. while 13.6% of respondents stated that the street was illegible for all users, see Figure 4.48.

When it comes to the existence of seats at AS-Souq street (**Q15**), (96.4%) of respondents mentioned that no enough seats existing at the street, while 3.6% of respondents confirmed the existence of seats. Moreover, (58.3%) of respondents who emphasized the existence of seats at the street, they also stated that seats were not conveniently located, see Table 4.7 and Table 4.8.

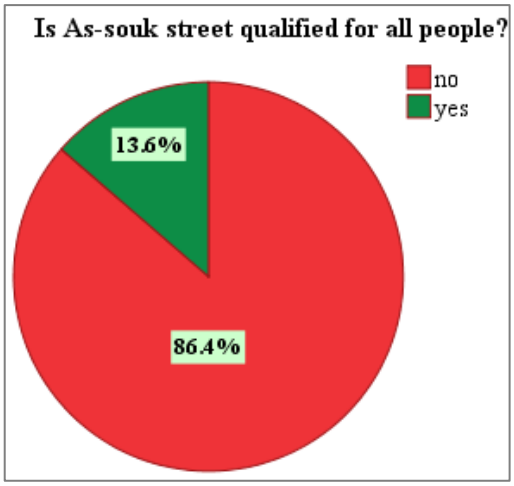

Figure 4.48 The ratio of respondents who confirmed on the non-qualification of AS-Souq street for all people (**Q14**)

Table 4.7 Respondents' percent about the existence of seats through the street (**Q15**)

Are there enough places to sit on the street?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	318	96.4	96.4	96.4
	yes	12	3.6	3.6	100.0
	Total	330	100.0	100.0	

Table 4.8 Respondents' ratio about location of seats at the street (**Q15**)

Are seats conveniently located?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	324	98.2	98.2	98.2
	yes	6	1.8	1.8	100.0
	Total	330	100.0	100.0	

Regarding (**Q16**) more than half (74.8%) of respondents accepted the division of AS-Souq street into six sectors while 25.2% of respondents did not accept the division, see Figure 4.49. As for allocating most street's sections for pedestrian only (**Q17**), (73.6%) of respondents agreed with this allocation, whereas, 26.4% of respondents did not accept, see Figure 4.50.

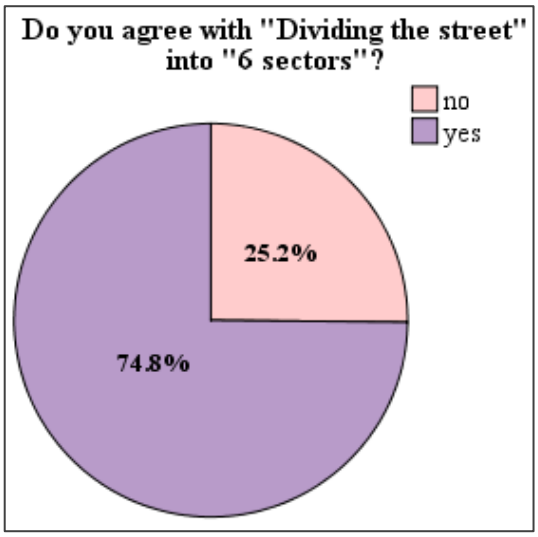

Figure 4.49 The respondents' percent which accepted the division of AS-Souq street(**Q16**).

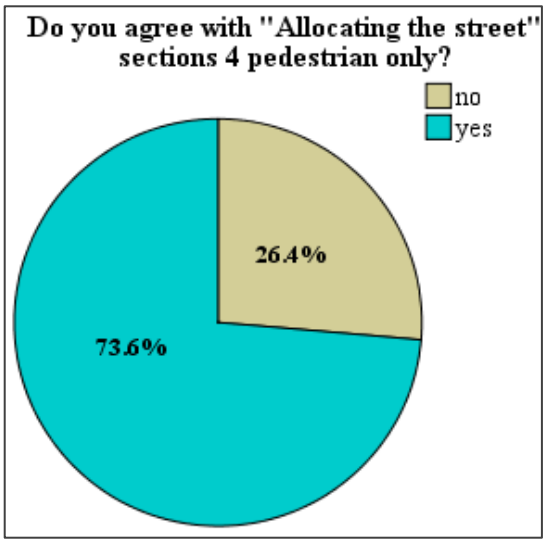

Figure 4.50 The respondents' percent which accepted an allocation of AS-Souq street for pedestrian only (**Q17**).

With regards to (**Q**uestions **18** to **20**), more than half (57%) of respondents of AS-Souq street confirmed that there were no ramps for the entry of urgent services to AS-Souq street, see Table 4.9. In addition to (80%) of respondents stated that there were no

accessible sidewalks for all people of different ages and abilities, see Table 4.10. Besides, (88.2%) of respondents emphasized that there no curb ramps at a level difference. see Table 4.11.

As for the existence of public toilets in most sectors of AS-Souq street (**Q21**), data distribution showed that (78.2%) of respondents stated that no public toilets existing in the street while 21.8% of respondents confirmed their existence. Moreover, (72.2%) of respondents who confirmed the existence of public toilets, they, too, mentioned that these toilets did not consider the need of all people with different ages and abilities, see Table 4.12 and Table 4.13.

Table 4.9 Respondents' percent about "Ramps' existence for the entry of urgent services" to AS-Souq street (**Q18**).

Are there "Ramps" for the entry of urgent services to the street?		**Frequency**	**Valid Percent**
Valid	no	188	57.0
	yes	142	43.0
	Total	330	100.0

Table 4.10 Respondents' percent about "Accessible sidewalks' existence" for all people(**Q19**).

Are there "Accessible sidewalks" for all people of different abilities?		**Frequency**	**Valid Percent**
Valid	no	264	80.0
	yes	66	20.0
	Total	330	100.0

Table 4.11 Respondents' percent about "Curb ramps' provision" at a level difference(**Q20**).

Are there "Curb ramps" provided at a level difference?		**Frequency**	**Valid Percent**
Valid	No	291	88.2
	Yes	39	11.8
	Total	330	100.0

Table 4.12 Respondents' percent about "Public toilet's existence" in most sectors of AS-Souq street (**Q21**).

Are there "public toilets" in most sectors of the street?		Frequency	Valid Percent
Valid	No	258	78.2
	Yes	72	21.8
	Total	330	100.0

Table 4.13 Respondents' percent about the toilets' considerations for all people(**Q21**).

Do they consider the needs of all people?		Frequency	Percent	Valid Percent
Valid	No	52	15.8	72.2
	Yes	20	6.1	27.8
	Total	72	21.8	100.0
Missing	x	258	78.2	
Total		330	100.0	

In evaluating (**Q22**), the data which were graphed showed that more than half (66.7%) of respondents felt comfortable and safe during their existence inside AS-Souq street, see Figure 4.51. Only 33.3% of respondents felt inconvenient. In contrast with (**Q23**), more than half (60%) of respondents stated that no security presence existing at the street, while 40% confirmed the existence of security forces, see Figure 4.52.

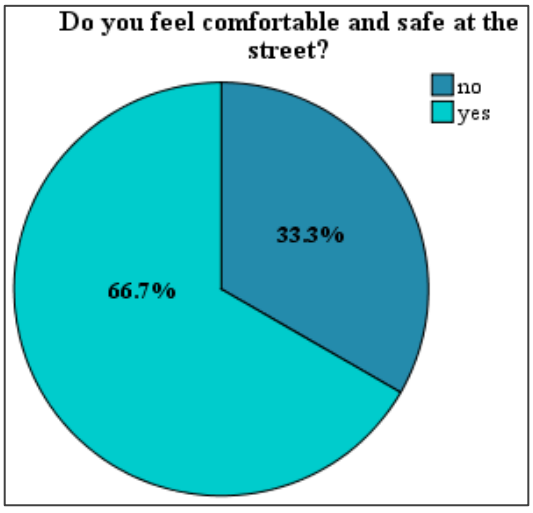

Figure 4.51 Respondents' percent about their feeling inside the street (**Q22**).

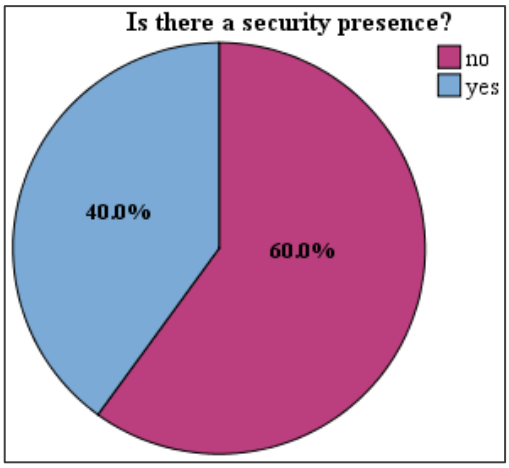

Figure 4.52 Respondents' ratio about a security presence inside As-souq street (**Q23**).

Concerning to (**Q**uestion **24**), more than half (83%) of respondents mentioned that no accessible pedestrian signs at AS-Souq street, while 17% of respondents confirmed the existence of pedestrian signals, see Figure 4.53. When it comes to the existence of prominent landmarks at the street (**Q25**), more than half (67.3%) of respondents emphasized that there were distinguished landmarks, whereas, 32.7% of respondents stated there were no landmarks at the street, see Table 4.14. As for types of the present landmarks at AS-Souq street, 32.4% of respondents pointed out to Gates, almost a half of (40.5%) of respondents selected Train station, 12.6% of respondents mentioned Artworks, 2.3% of respondents chose Statue, 10.4% of respondents stated Shops façade/ Tourist bazaars, .9% of respondents said Murals, and finally .9% of respondents selected Shrine, see Figure 4.54.

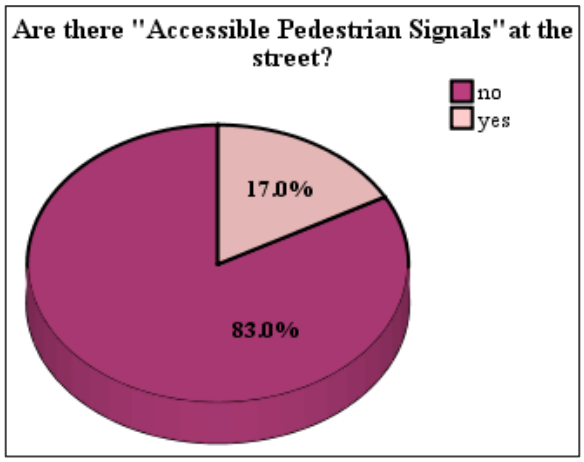

Figure 4.53 Respondents' percent about the existence of accessible pedestrian signs at the street (**Q24**).

Table 4.14 Respondents' ratio about the existence of landmarks at AS-Souq street(**Q25**).

Are there any prominent landmarks?		Frequency	Valid Percent
Valid	No	108	32.7
	Yes	222	67.3
	Total	330	100.0

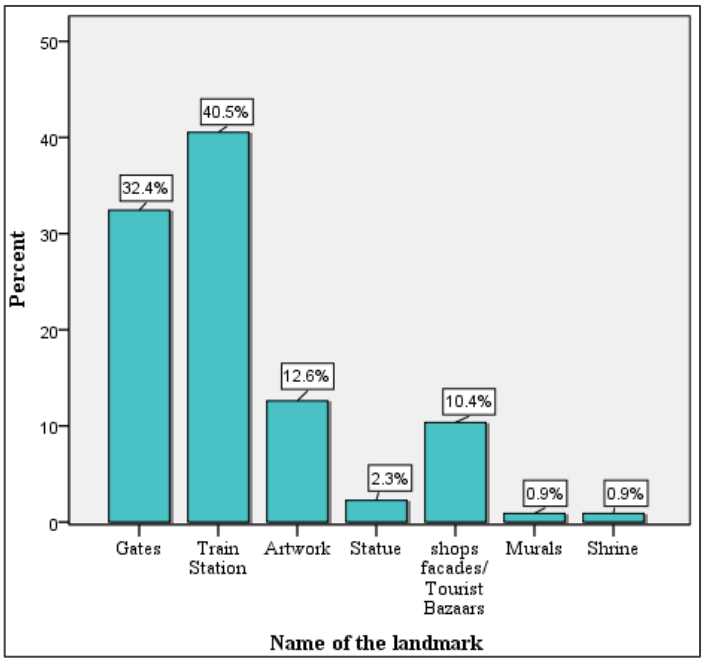

Figure 4.54 The existing landmarks' distribution at the street (**Q25**).

As for the provision of parking spaces at AS-Souq street (**Q26**), data distribution showed that (92.1%) of respondents stated that no parking existing at the street while 7.9% of respondents confirmed their existence, see Table 4.15. Furthermore, (80.8%) of respondents who confirmed the existence of parking spaces, they said also that this parking did not consider the need of all people with different ages and abilities, see Table 4.16.

Table 4.15 Respondents' percent about "Parking spaces' existence" at AS-Souq street(**Q26**).

Are "parking spaces " provided at the street?		Frequency	Valid Percent
Valid	No	304	92.1
	Yes	26	7.9
	Total	330	100.0

Table 4.16 Respondents' percent about the parking considerations for all people(**Q26**)

Do they consider the needs of all car users?		Frequency	Percent	Valid Percent
Valid	No	21	6.4	80.8
	Yes	5	1.5	19.2
	Total	26	7.9	100.0
Missing	x	304	92.1	
Total		330	100.0	

According to the analysis of vision of billboards through passing AS-Souq street (**Q27**), (65.8%) of respondents clearly noticed the billboards through passing the street, while 34% of respondents did not observe, the data were graphed in Figure 4.55.

As for sufficient lighting elements (**Q28**), (67.6%) of respondents emphasized on an adequate number of lighting elements at the street, whereas, 32.4% of respondents stated no enough elements available, see Figure 4.56.

When it comes to the respondents' level of satisfaction about the street floor material (**Q29**), (63.2%) of respondents confirmed on the unsafe and non-durable floor material in some sections of the street. Only 34.8% of respondents felt safe and comfortable, see Figure 4.57.

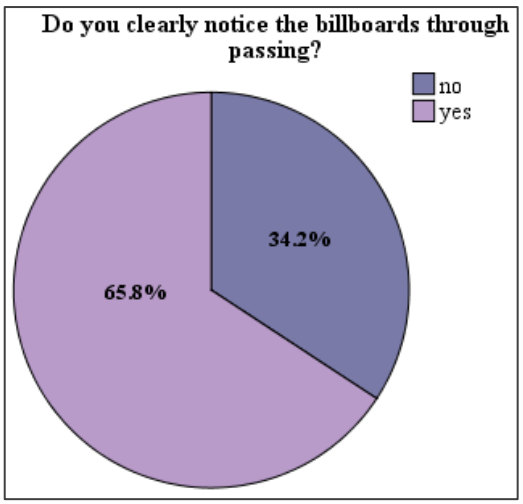

Figure 4.55 Respondents' percent about noticing the billboards through passing AS-Souq street (**Q27**).

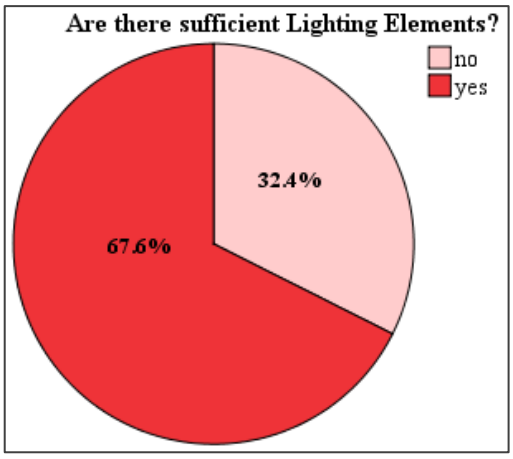

Figure 4.56 Respondents' percent about provision of lighting elements (**Q28**)

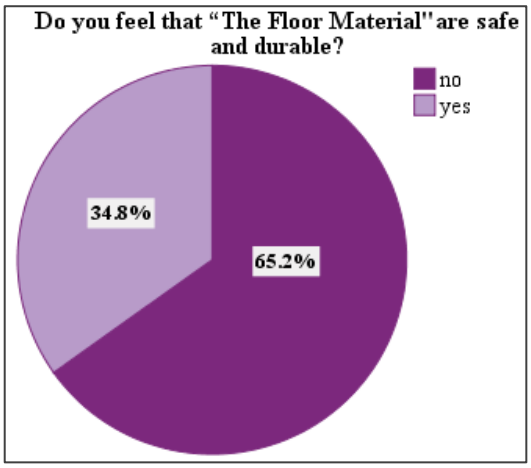

Figure 4.57 Respondents' level of satisfaction about the street floor material (**Q29**)

4.4.1.4 Section 3: Uses & Activities (Questions 30 to 32)

This section focuses on the quality/ criteria of "Uses and activities" via the evaluation of responses of questions 30 to 32. **Q30** (How frequently have you been visiting this street? Average times per month), **Q31** (How long do you usually spend at this street?), and **Q32** (Are there different types of activities occurring at the street? If yes, Kind of the activities). These questions aim to find out the respondents‘ preferences regarding familiarity frequency of visits, duration of visit, and types of activities occurring at AS-Souq street.

Since (**Q30**) was an open-ended question, the analysis was based on a preset categorization of answers depending on the original respondents' responses, Figure 4.58 showed that 25.2% of respondents visited AS-Souq street "less than 10 times" per

month. 13.6% of respondents visited the street "from 10 to 25 times" per month. More than half (59.7%) of respondents visited AS-Souq every day. Only 1.5% of respondents visited it throughout their visit owing to they were foreigners.

Regarding "Average time spent" at AS-Souq street (**Q31**), Figure 4.59 showed that 18.8% of respondents just pass through the street. 20.6% of respondents spent around half an hour. 26.1% of respondents spent more than one hour. (34.5%) of respondents have spent all day on the street.

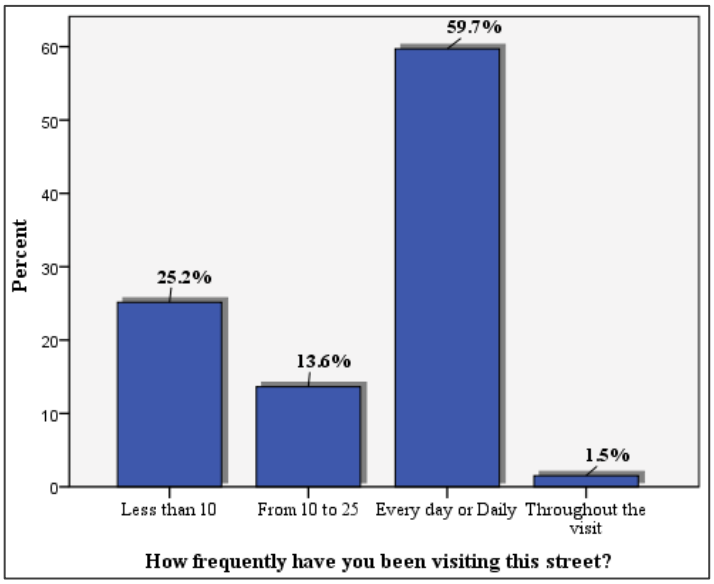

Figure 4.58 Frequency of visits‘ of AS-Souq street's Respondents (**Q30**)

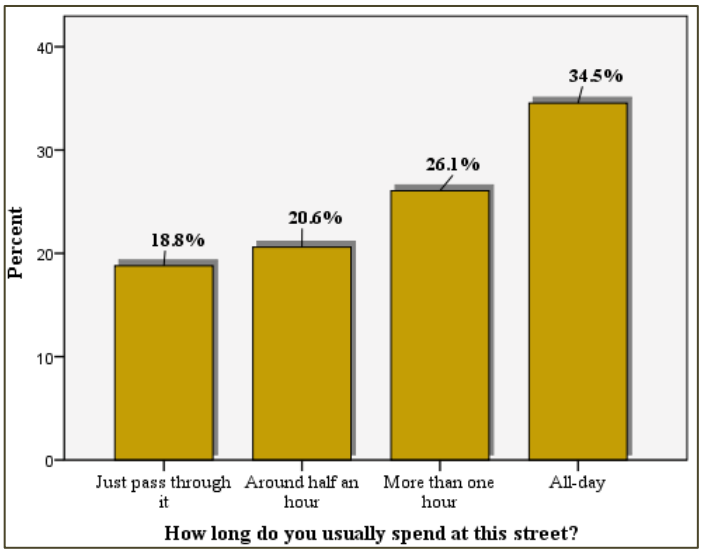

Figure 4.59 Average time spent" at AS-Souq street (**Q31**)

Concerning "Types of activities occurring at AS-Souq street (**Q32**)", the overwhelming majority (91.8%) of respondents emphasized that the street includes many kinds of activities. Only 8.2% of respondents stated that no different types of activities happened at A-souq, the data were graphed in Figure 4.60.

As can be seen in Figure 4.61 below, 7.3% of respondents mentioned "walking" as an activity occurring at AS-Souq street, 29% of respondents selected "shopping", 8.9% of respondents stated "eating/ having a meal", 7.6% of respondents chose "entertainment/ fun", 3.6% of respondents mentioned "meeting friends or visiting relatives", 4.6% of respondents selected "visiting physician; lawyer; engineer,..etc", 2.3% of respondents stated "going to work", and finally, (36.6%) of respondents said "all the above mentioned".

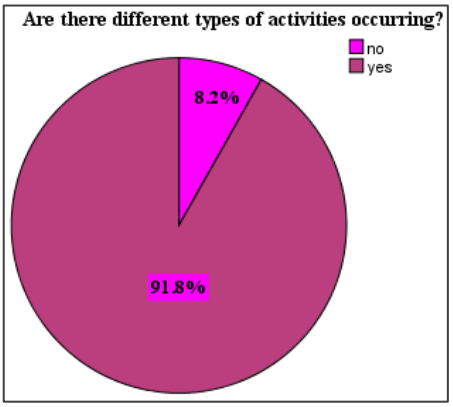

Figure 4.60 Different types of activities occurring at AS-Souq street (**Q32**)

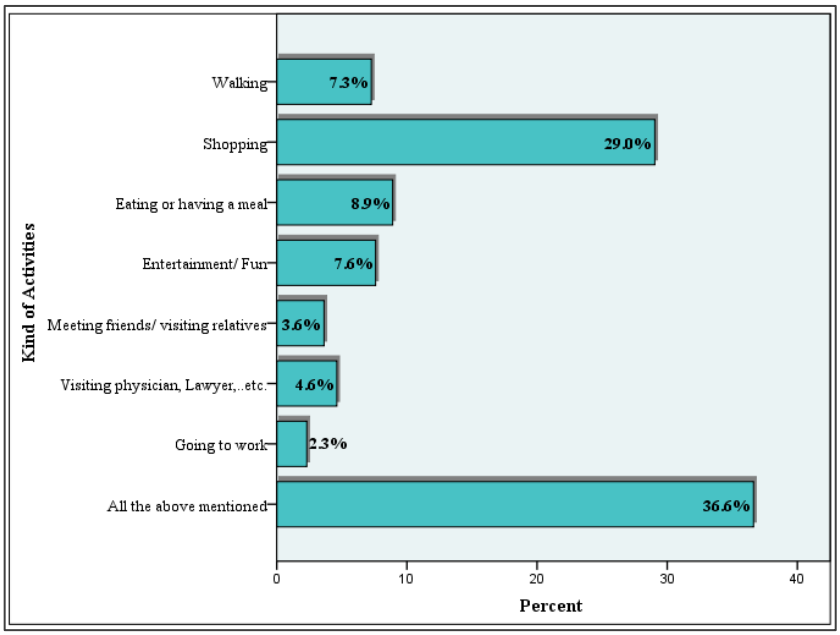

Figure 4.61 Respondents' choices about the different kinds of activities occurring at AS-Souq street (**Q32**)

4.4.1.5 Section 4: Sociability (Questions 33 to 36)

This section focuses on the criterion "Sociability/ a social space" via the evaluation of responses to **Q30** (AS-Souq street's visit is preferable for you), **Q31** (Walking with relatives and friends is a desirable activity for you at the street), **Q32** (Knowing people by "face or name" is spontaneously happened on this street), and **Q33** (Interaction with foreigners is done easily on the street).

In evaluating (Q33 to Q36), these questions followed one style which its target is to understand the level of respondents' satisfaction and their feeling regarding a social side of AS-Souq street as an urban public space. In other words, this evaluation is aimed to realize to what extent can occur such strong social relations inside AS-Souq street.

Depending on data collected (**Q33**), 6.4% of AS-Souq street‘s respondents strongly disagreed about "preference of AS-Souq street's visit", 12.4% of respondents slightly disagreed, 1.2% of respondents were neutral, 3% of respondents slightly agreed, and the overwhelming majority (77%) of respondents strongly agreed about "preference of street's visit", see Figure 4.62.

As for "preference of walking with relatives and friends at AS-Souq street" (**Q34**), 9.7% of AS-Souq street‘s respondents strongly disagreed, 21.5% of respondents slightly disagreed, .9% were neutral, 6.1% of respondents slightly agreed, and more than half (61.8%) of respondents strongly agreed about "preference of walking with friends", see Table 4.17.

Regarding "Knowing people by face or name inside AS-Souq street" (**Q35**), 15.2% of AS-Souq street‘s respondents strongly disagreed, 10.3% of respondents slightly disagreed, 1.8% of respondents were neutral, 8.5% of respondents slightly agreed, and more than half (64.2%) of respondents strongly agreed about "knowing people by face or name", see Table 4.18.

When it comes to "Interaction with foreigners at AS-Souq street" (**Q36**), 26.1% of AS-Souq street‘s respondents strongly disagreed, 13.3% of respondents slightly disagreed, 1.2% of respondents were neutral, 13.6% of respondents slightly agreed, and around half (45.8%) of respondents strongly agreed about "interaction with foreigners", see Figure 4.63.

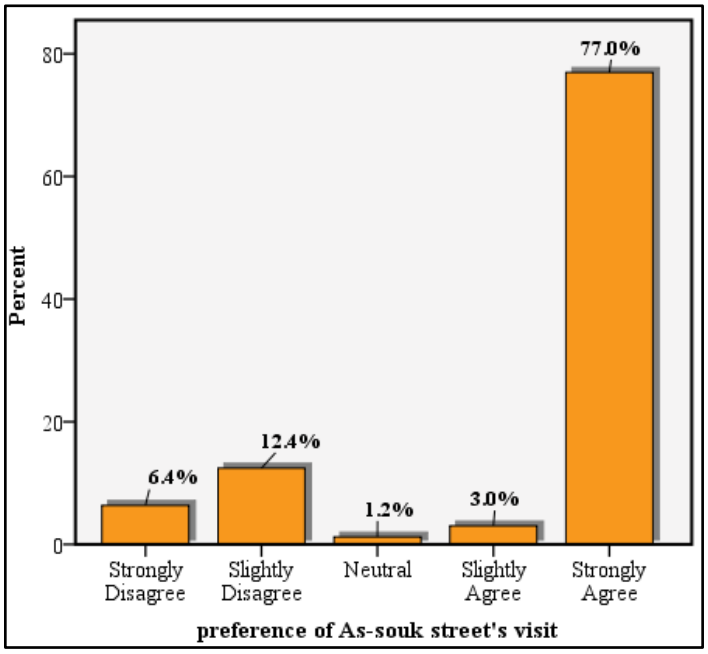

Figure 4.62 Respondents' percent regarding preference of AS-Souq street's visit (**Q33**)

Table 4.17 Respondents' distribution regarding preference of walking with relatives & friends at AS-Souq street (**Q34**)

preference of walking with relatives & friends at AS-Souq street		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	32	9.7	9.7
	Slightly Disagree	71	21.5	31.2
	Neutral	3	.9	32.1
	Slightly Agree	20	6.1	38.2
	Strongly Agree	204	61.8	100.0
	Total	330	100.0	

Table 4.18 Respondents' distribution regarding Knowing people by face or name inside AS-Souq street (**Q35**)

Knowing people by face or name inside AS-Souq street		Frequency	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	50	15.2	15.2
	Slightly Disagree	34	10.3	25.5
	Neutral	6	1.8	27.3
	Slightly Agree	28	8.5	35.8
	Strongly Agree	212	64.2	100.0
	Total	330	100.0	

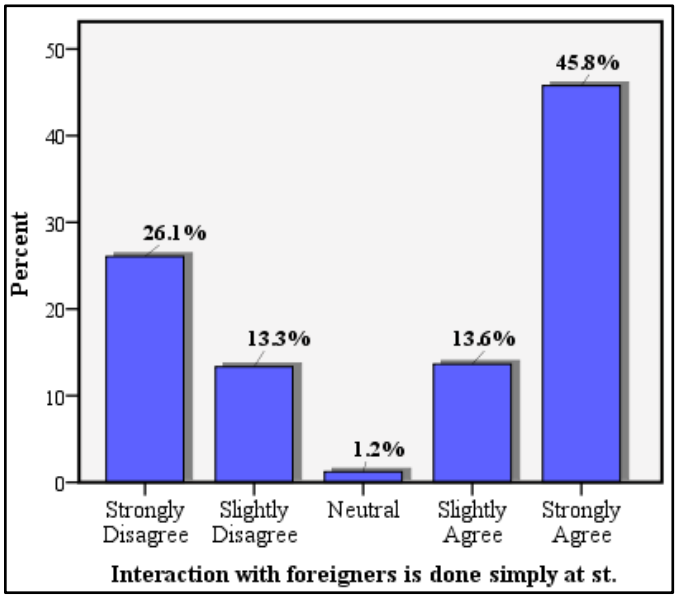

Figure 4.63 Respondents' distribution regarding Interaction with foreigners at AS-Souq (**Q36**)

4.4.2 The Second Phase of "Statistical Analysis Of Questions Comparatively" by "*Chi*-Square Test (X^2)" and "One-Sample T-Test"

The data provided by the questionnaire were statistically analyzed to clarify "the relationships between different user characteristics and priorities, preference, and frequency of visit encountered problems, spent time,...etc" which are variables of the survey. The differences were detected by ***"Chi*-Square Tests"** were tabled via Cross-tabulation for a general evaluation of the data, **review Figure 4.38**.

In this part, the study presents **the explanation of the results of the** "**Cross tabulations**", whereas, **the tables themselves** are existing in **Appendix A**. Also, **the tables** of **"Chi-square test"** are attached in **Appendix A**. Besides, **the illustration** of the **"One-Sample T-Test" and its tables** are available in **Appendix A**.

This dissertation poses that there are associations between some variables "Questions" and each other. In this part, the study selected some questions which help in finding answers to the main research questions. In other words, *the research questions of this study will be proved by perceiving and grasping the relationships between those selected questions*. In this context, the results of this evaluation as follows:

4.4.2.1 Cross-Tabulations For Significant Relations in x^2 Analyses For AS-Souq Street

1) The study sampled 330 respondents, and evaluated whether there is any association between "Arrival to AS-Souq street (**Question 10**)" and each of the following variables: "Gender (**Q1**); User Type (**Q2**); Age group (**Q3**); and Physical Disability (**Q6**)".

The "Arrival to AS-Souq (**Q10**)" is not significantly associated to "Gender (Q1)". Whereas, "The arrival to the street (Q10)" is significantly associated to "User Type (Q2)", X^2 (3, N = 330) = 36.007, P = .000. Also, the street's visitors encounter more difficulty in arriving AS-Souq than the other personalities. Moreover, the association between "Arrival to the street (Q10)" and "Age Group (Q3)" is statistically significant, " X^2 (3, N = 330) = 13.460, P = .004. Besides, "Arrival to AS-Souq (Q10)" is significantly related to "physical disability (Q6)", X^2 (1, N = 330) = 9.677, P = .002.

2) When it comes to the association between (**Question 11**) and each of the following: "(**Q**uestion **1**); **Q**uestion **2**); (**Q**uestion **3**); and (**Q**uestion **6**)".

"Difficulties which encountering the street's users (**Q11**)" is significantly related to "Gender (**Q1**)", X^2 (1, N = 330) = 6.733, P = .009. Men confront more difficulties in entering AS-Souq street than women. Furthermore, "Difficulties in entering AS-Souq (Q11)" is significantly associated to "User Type (Q2)", X^2 (3, N = 330) = 62.489, P = .000. Whereas, the association between "Difficulties in entering the street (Q11)" and "Age Group (Q3)" is not statistically significant. Also, "Difficulties in entering (Q11)" is not significantly related to "physical disability (Q6)".

3) Regarding the association between (**Question 13**) with each of the following: "(**Q**uestion **1**); (**Q**uestion **2**); and (**Q**uestion **3**)".

Respondents' view concerning to "Importance of AS-Souq street (Q13)" is not significantly related to "Gender (Q1)". Whereas, the *chi*-square test is significant to clarify the association between "Importance of AS-Souq (Q13)" and "User Type (Q2)", these two variables are significantly related to each other, X^2 (3, N = 330) = 10.896, P = .012. Additionally, "Importance of AS-Souq (Q13)" is not significantly associated with "Age group (Q3)".

4) As for the association between "Qualification of AS-Souq street for all people (**Question 14**)" with each of the following variables: "Gender (**Q1**); User Type (**Q2**); Age group (**Q3**); and Physical disabilities (**Q6**)".

"Qualification of AS-Souq for all (Q14)" is not significantly related to "gender (Q1)". Whereas, "Qualification of AS-Souq for all (Q14)" is significantly associated to "User Type (Q2)", X^2 (3, N = 330) = 23.544, P = .000. The largest number of the street's visitors and architects have emphasized on the non-qualification of AS-Souq for all people of different ages and abilities. Furthermore, the association between "Qualification of AS-Souq for all (Q14)" and "Age Group (Q3)" is not statistically significant. While, "Qualification of AS-Souq for all (Q14)" is significantly related to "The existence of physical disability (Q6)", X^2 (1, N = 330) = 5.177, P = .023.

5) Concerning the relation between "Allocation As-souq street for pedestrian only (**Question 17**)" with each of the following variables: "Personality (**Q2**); Age group (**Q3**); and Physical Disability (**Q6**)".

The *chi*-square test is statistically significant for the following cases: "Allocation As-souq street for pedestrian only (Q17)" is significantly related to "Personality(Q2)", X^2 (3, N = 330) = 10.536, P = .015. Furthermore, "Allocation As-souq for pedestrian (Q17)" is significantly associated to "Age group (Q3)", X^2 (3, N = 330) = 9.847, P = .020. While the association between "Allocation As-souq for pedestrian (Q17)" and "Physical Disability (Q6)" is not statistically significant. In other words, "Allocation of As-souq street to pedestrian (Q17)" is not significantly related to "Physical Disability (Q6)".

6) With regard to the association between "Durability and safety of AS-Souq street's floor material (**Question 29**)" with each of the following variables: "User Type (**Q2**); and Physical Disability (**Q6**)".

"Durability of AS-Souq's floor material (**Q29**)" is significantly associated to "Personality(Q2)", X^2 (3, N = 330) = 52.360, P = .000. Moreover, "Durability of AS-Souq's floor material (Q29)" is significantly related to "Physical Disability(Q6)", X^2 (1, N = 330) = 7.007, P = .008.

7) When it comes to the relationship between (**Question 18**) with each of the following variables: "(**Q**uestion **2**); and (**Q**uestion **6**)".

"Ramps for the urgent services' entry to AS-Souq (Q18)" is significantly related to "Personality (Q2)", X^2 (3, N = 330) = 97.334, P = .000, (see Table 4.43). Additionally, "Ramps for the urgent services' entry to AS-Souq (Q18)" is significantly associated to "Physical Disability (Q6)", X^2 (1, N = 330) = 7.253, P = .007.

8) As for the association between (**Question 24**)" with each of the following variables: "(**Q**uestion **2**); and (**Q**uestion **6**)".

"Accessible Pedestrian Signals and signage at AS-Souq street (Q24)" is significantly related to "Personality (Q2)", X^2 (3, N = 330) = 19.980, P = .000. Whereas, "Accessible Pedestrian Signals and signage at AS-Souq (Q24)" is not significantly associated with "physical disability (Q6)".

9) Regarding the connection between (**Question 21**) and each of the following: "(**Q**uestion **1**); (**Q**uestion **2**); and (**Q**uestion **6**)".

"Public toilets in most sectors of AS-Souq street (Q21)" is not significantly associated to "Gender (Q1)", "Personality (Q2)" and "physical disability (Q6)" is not statistically significant.

10) On the subject of the association between (**Question 22**) and (**Q**uestion **23**).

The result of the evaluation found that "Sense of comfort and safety at AS-Souq street (Q22)" and "Security presence (Q23)" is statistically significant, X^2 (1, N = 330) = 86.420, P = .000, (see Table 4.50). In other words, "Sense of comfort at AS-Souq (Q22)" is significantly associated with "Security presence (Q23)".

11) With respect to the relationship between (**Question 30**) and each of the following: (**Q**uestion **1**; **Q**uestion **3**; and **Q**uestion **5**).

"Frequency of visit (Q30)" is significantly associated to "gender (Q1)", X^2 (3, N = 330) = 21.066, P = .000. In addition to, "Frequency of visit (Q30)" is significantly related to "Age group (Q3)", X^2 (9, N = 330) = 32.345, P = .000. Also, "Frequency of visit (Q30)" is significantly associated to "Profession (Q5)", X^2 (21, N = 330) = 178.033, P = .000.

12) With reference to the relation between (**Question 31**) and each of the following: (**Q**uestion **1**; **Q**uestion **2**; and **Q**uestion **5**).

"Spent time inside AS-Souq street (Q31)" is significantly associated to "Gender (Q1)", X^2 (3, N = 330) = 19.641, P = .000, (see Table 4.54). Furthermore, " Spent time (Q31)"

is significantly associated to "Personality (Q2)", X^2 (9, N = 330) = 330.558, P = .000. Also, " Spent time (Q31)" is significantly related to "Profession (Q5)", X^2 (21, N = 330) = 289.325, P = .000.

13) As regards the relationship between (**Question 33**) and each of the following: (**Q**uestion **1**; **Q**uestion **2**; **Q**uestion **3**; and **Q**uestion **32**).

"Preference of visit (Q33)" is significantly associated to "Gender (Q1)", X^2 (4, N = 330) = 10.833, P = .029. Whereas, "preference of visit (Q33)" is not significantly related to "Personality (Q2)". Additionally, "Frequency of visit (Q33)" is significantly associated to "Age group (Q3)", X^2 (12, N = 330) = 22.148, P = .036, (see Table 4.59). It is interesting and unexpected result that "Frequency of visit (Q33)" is not significantly related to "Diversity of activities (Q32)".

14) Finally, as for the association between (**Question 34**) and each of the following: "(**Q**uestion **1**); and (**Q**uestion **3**)".

Here, the *chi*-square test is significant. "Preference of walking with relatives & friends (Q34)" is significantly related to "Gender (Q1)", X^2 (4, N = 330) = 13.669, P = .008. Furthermore, "Preference of walking with relatives & friends (Q34)" is significantly associated to "Age group (Q3)", X^2 (12, N = 330) = 53.292, P = .000.

4.5 Discussion Of Findings: (Questionnaire, Observations, and Interviews)

In this part, the study discusses the obtained results from the survey questionnaire, direct observations, and in-depth Interviews.

4.5.1 Survey Questionnaire

The inclusive statistical analysis of the 36 questions can be seen in Table 4.19 which depends on the qualities of urban public space and the universal design principles.

Table 4.19 The holistic statistical analysis of the 36 questions of the questionnaire.

User Profiles			Frequency	Valid Percent
No	Question Title			
1	Gender	Male	259	78.5
		Female	71	21.5
2	User Type	Visitor	110	33.3
		Shop Owner	110	33.3
		Architect / Planner	55	16.7
		Government Official	55	16.7
3	Age Group	10-25	36	10.9
		25-40	147	44.5
		40-65	126	38.2
		Over than 65	21	6.4
4	Level of Education:	none	6	1.8
		Primary	7	2.1
		preparatory	20	6.1
		Secondary	73	22.1
		Undergraduate	12	3.6
		Graduate	181	54.8
		Postgraduate	25	7.6
		PhD	6	1.8
5	Profession/occupation	Employee	51	15.5
		Student	14	4.2
		Self-employed	126	38.2
		Professional	8	2.4
		Housewife	13	3.9
		Retired/ Unemployed	8	2.4

Table 4.19 (cont'd)

		Architect or Planner	55	16.7
		Government Official	55	16.7
6	Physical Disability:	None	288	87.3
		(Yes)	42	12.7
	Disability Kind:	Hearing	11	26.2
		Vision	14	33.3
		Motion	8	19.0
		Disabled or handicapped	5	11.9
		Amputated arm	1	2.4
		Infantile paralysis	3	7.1

Section 1. (***Access*** & ***Linkages***)			**Frequency**	**Valid Percent**
No	**Question Title**			
7	Can you see AS-Souq street from a distance?	No	135	40.9
		Yes	195	59.1
8	From which district or city did you come to the street?	Aswan & its villages	309	93.6
		Outside of Aswan [Cairo, Menia, Sohage,..]	21	6.4
9	How did you arrive at the street?	On foot	162	49.1
		Private car	64	19.4
		Bike/motorcycle	14	4.2
		Mass transport	90	27.3
	Kind of "***Mass Transport***"	Bus	10	11.1
		Minibus	62	68.9
		Taxi	15	16.7
		Train	2	2.2
		Boat or Sailboat	1	1.1
10	Did you arrive at the street easily?	(No)	203	61.5
		Yes	127	38.5
	What are the **difficulties** in reaching?	No pedestrian crossing close to the street	25	12.3
		There are no bus stops close to the street	7	3.4
		Sidewalks are not good enough or not existing	37	18.2
		There are no pedestrian paths available	17	8.4
		The street floors are not qualified well	44	21.7

Table 4.19 (cont'd)

		There are physical disabilities	10	4.9
		Traffic jam	16	7.9
		Inconvenient roads	31	15.3
		Insufficient parking	11	5.4
		Waiting period for buses or minibusses	5	2.5
11	Do you confront any difficulties in entering the street?	No	147	44.5
		Yes	183	55.5
12	How long did your trip take? (in minutes)	From 5 to15 min.	175	53.0
		From 15 to 30 min.	104	31.5
		From 30min. To 1 hour	39	11.8
		From 1 hour to 2 hours	12	3.6
Section 2. (***Comfort & Image***)			**Frequency**	**Valid Percent**
No	**Question Title**			
13	Do you feel that AS-Souq street has a unique character & special importance?	No	12	3.6
		Yes	318	96.4
14	Is the street qualified for all people of different ages and abilities?	No	285	86.4
		Yes	45	13.6
15	Are there enough places to sit on the street?	No	318	96.4
		Yes	12	3.6
16	Do you agree with dividing the street into “Six sectors” by a number of new gates?	No	83	25.2
		Yes	247	74.8
17	Do you agree with allocating most of the street sections for pedestrian only?	No	87	26.4
		Yes	243	73.6
18	Are there ramps for the entry of urgent services to the street?	No	188	57.0
		Yes	142	43.0
19	Are there accessible sidewalks support the diverse needs of people of all abilities?	No	264	80.0
		Yes	66	20.0
20	Are there Curb ramps provided when there is a level difference?	No	291	88.2
		Yes	39	11.8
21	Are there public toilets in most sectors of the street?	No	258	78.2
		Yes	72	21.8
22	Do you feel comfortable and safe on the street?	No	110	33.3
		Yes	220	66.7

Table 4.19 (cont'd)

23	Is there a security presence?	No	198	60.0
		Yes	132	40.0
24	Are there Accessible Pedestrian Signals and signage at As-souq?	No	274	83.0
		Yes	56	17.0
25	Are there any prominent landmarks to remember the street and its location?	No	108	32.7
		Yes	222	67.3
	The ***existing landmarks*** at AS-Souq street	Gates	72	32.4
		Train Station	90	40.5
		Artwork	28	12.6
		Statue	5	2.3
		Shops facades or Tourist Bazaars	23	10.4
		Murals	2	.9
		Shrine	2	.9
26	Are "parking spaces" provided at the street?	No	304	92.1
		Yes	26	7.9
27	Do you clearly notice the billboards through passing the street?	No	113	34.2
		Yes	217	65.8
28	Are there sufficient Lighting Elements at the street?	No	107	32.4
		Yes	223	67.6
29	Do you feel that "The Floor Material" of the street are safe and durable?	No	215	65.2
		Yes	115	34.8
Section 3. (*Uses* & *Activities*)			**Frequency**	**Valid Percent**
No.	**Question Title**			
30	How frequently have you been visiting this street? (Average times per month)	Less than 10	83	25.2
		From 10 to 25	45	13.6
		Every day/ Daily	197	59.7
		Throughout the visit	5	1.5
31	How long do you usually spend on this street?	Just pass through it	62	18.8
		Around half an hour	68	20.6
		More than one hour	86	26.1
		All-day	114	34.5
32	Are there different types of activities occurring at the street?	No	27	8.2
		Yes	303	91.8
	Kind of Activities	Walking	22	7.3
		Shopping	88	29.0

Table 4.19 (cont'd)

		Eating or having a meal	27	8.9
		Entertainment/ Fun	23	7.6
		Meeting friends or visiting relatives	11	3.6
		Visiting physician (doctor), Lawyer, or Engineer, ..etc.	14	4.6
		Going to work	7	2.3
		All the above mentioned	111	36.6
Section 4. (***Sociability***)			**Frequency**	**Valid Percent**
No.	**Question Title**			
33	AS-Souq street's visit is preferable for you.	Strongly Disagree	21	6.4
		Slightly Disagree	41	12.4
		Neutral	4	1.2
		Slightly Agree	10	3.0
		Strongly Agree	254	77.0
34	Walking with relatives and friends is a desirable activity for you at the street.	Strongly Disagree	32	9.7
		Slightly Disagree	71	21.5
		Neutral	3	.9
		Slightly Agree	20	6.1
		Strongly Agree	204	61.8
35	Knowing people by "face or name" is spontaneously happened on this street.	Strongly Disagree	50	15.2
		Slightly Disagree	34	10.3
		Neutral	6	1.8
		Slightly Agree	28	8.5
		Strongly Agree	212	64.2
36	Interaction with foreigners is done easily on the street.	Strongly Disagree	86	26.1
		Slightly Disagree	44	13.3
		Neutral	4	1.2
		Slightly Agree	45	13.6
		Strongly Agree	151	45.8

Based on the survey findings reported in "**Table 4.19"**, the study sample was collected from As-souq street who were 330 respondents, and the statistical analysis of the questionnaire's questions were achieved "individually", each variable (Q1 to Q36) was analyzed one after the other according to the qualities of urban public space which the survey's questions depended on.

The study found that the sample's gender tended to be male (78.5%), and relatively young (44.5%) of respondents "between 25 to 40 years old". Besides, the respondents' level of education were (graduate 54.8%). Also, the study's sample pointed that high percent of surveyed people (38.2%) were "self-employed", then (16.7%) of surveyed were "architects and planners". While (12.7%) of respondents had "physical disabilities", and (33.3%) of those surveyed complained that "they had vision's problems".

As for (**Section 1. Access & Linkage**), the study found that more than half (59.1%) of respondents could see As-souq street from a distance which can prove "the accessibility of the street by its connections to its surroundings. A good public space should be easy to get, and it is apparent from a distance and close. Furthermore, the sample's surveyed people (49.1%) arrived at As-souq street "on foot", while, (27.3%) of respondents used different kinds of "mass transport". Also, (53.0%) of the surveyed persons their trip to the street took "from 5 to 15 minutes". Besides, (93.6%) of respondents were coming from "Aswan and its villages", so their trip to the street was short and mostly reached on foot. Additionally, the study found that more than half of the sample's respondents (61.5%) arrived at As-souq street with difficulty and scarcely. Further, (21.7%) of those respondents complained from "the ineligible floor material of As-souq". Also, more than half of surveyed persons (55.5%) confronted some difficulties in entering the street.

Regarding (**Section 2**. **Comfort and Image**), this study indicated to a good first impression and special significance of As-souq street through the overwhelming majority (96.4%) of respondents who felt a unique character about this street. Besides, (67.3%) of respondents confirmed on "the existence of prominent landmarks at As-souq street in order to remember the place, for instance: gates, artworks,..etc". Also, an

overwhelming majority (96.4%) of surveyed persons approved "the unavailability of places to sit at As-souq". Furthermore, more than half (60.0%) of surveyed people "the unavailability of security presence at As-souq street". Nevertheless, (66.7%) of those surveyed "felt safe and comfortable on the street".

When it comes to "qualification of the street for all people", (86.4%) of respondents confirmed that "As-souq street was unqualified for all people of different ages and abilities". It was clear by the non-existence of some basic elements at the street, as follows:

- More than half (57.0%) of recipients approved "the non-existence of ramps for the urgent services' entry to As-souq street".
- In addition to (80.0%) of surveyed persons confirmed on "the inaccessible sidewalks which did not support the diverse needs of people".
- Beside (88.2%) of recipients indicated to "the non-provision of curb ramps when there is levels difference".
- Likewise, (83.0%) of respondents confirmed on "the non-existence of accessible pedestrian signals and signage at As-souq".
- Additionally, (78.2%) of surveyed persons stated that "there were no enough public toilets in most of the street's sections".
- Further, more than half (65.2%) of respondents complained of "the unsafe and non-durable material of the street's floor"
- Also, the overwhelming majority (92.1%) of surveyed confirmed on "the non-provision of parking spaces at the street".

All the above-mentioned items affirmed that As-souq street is ineligible for all people of different ages and abilities.

More than half (65.8%) of respondents were "clearly noticed the billboards through passing As-souq street". Also, (67.6%) of those respondents confirmed on "the sufficiency of the lighting elements at the street". Furthermore, "the allocation most of the street's sections for pedestrian only" was approved by (73.6%) of surveyed persons. Beside (74.8%) of those surveyed accepted "the division of As-souq street into six sections by the new gates".

Concerning (**Section 3**. **Uses & Activities**), the study clarified that more than half (59.7%) of respondents "have been visiting As-souq street daily". Besides, (34.5%) of the sample's respondents "had spent all-day at this street", which indicates that "As-souq street is used throughout the day". Moreover, the overwhelming majority (91.8%) of surveyed persons confirmed on "the existence of different kinds of activities occurring at As-souq for instance: shopping, walking, ..etc", which affirms that "the more activities that are going and that people have an opportunity to participate in".

Eventually, (**Section 4**. **Sociability**), the study showed that more than half (77.0%) of surveyed people were "strongly agreed about As-souq street's visit". Besides, (61.8%) of surveyed were "strongly preferred walking with relatives and friends on the street". Also, (64.2%) of respondents affirmed on "the easy recognition among people by face or name inside the street". Further, around half (45.8%) of surveyed people confirmed on "the spontaneous interaction with foreigners at As-souq street". Ultimately, the study interprets that when people prefer "As-souq street's visit", see their friends, meet relatives, and feel comfortable while interacting with strangers, they tend to feel a stronger sense of this street or attachment to their community and to the street that foster those types of social activities.

The next part illustrates the significant relationships between some questions and each other which can be seen in "Table 4.20"

Table 4.20 The matrix of the significant relationships between some questions.

	Q 1 Gender	Q 2 User Type	Q 3 Age Group	Q 5 Profession	Q 6 Physical Disability	Q 23 Security presence
Q 10 The arrival to AS-Souq"		●	●		●	
Q 11 Difficulties in entering	●	●				
Q 13 Importance of AS-Souq street		●				
Q 14 Qualification of As-souq for all		●			●	
Q 17 Allocation most of the street's sectors for pedestrian		●	●			
Q 29 Durability of the floor material"		●			●	
Q 18 Ramps for the urgent services' entry		●			●	
Q 24 Accessible pedestrian signals & signage		●				
Q 22 Sense of comfort and safety						●
Q 30 Frequency of visit	●		●	●		
Q 31 Spent time inside As-souq street	●	●		●		
Q 33 preference of visit	●		●			
Q 34 Preference of walking with relatives&friends	●		●			

The dissertation sampled 330 respondents and posed that there were associations between Some of the questions to each other. The research questions of this dissertation

could be proved by grasping the relationships between those chosen questions. Only the influential and significant associations were included in the above comparative table, and I highlighted the box that encompassed the important relationships.

According to **Table 4.20**, the study confirmed that "Age group; the existence of physical disabilities; and the personality" have a clear impact on the difficulty of the surveyed people's arrival to As-souq street. Also, "Gender of the respondents and their personalities" is considered an important reason for entering the street easily. Besides, "The personality of the respondents" had a significant influence on "The respondents' sense of the street's importance".

This dissertation also revealed that "The existence of physical disabilities; and personality" affected on the respondents' sense of "The disqualification of As-souq street for all; and the non-durable floor materials of the street", beside the respondents' observation of "the non-existing of accessible pedestrian signage at As-souq street". Furthermore, "The age group and the personality" had an obvious role about the extent of respondents' acceptance of "Allocation most of the streets sections for pedestrian only".

Moreover, "The respondents' sense of comfort and safety" were strongly associated with "The provision of the security presence at As-souq street". Besides, "The age group of the respondents and gender" had a significant impact on "The surveyed persons' preference of the street's visit, and walking with their relatives and friends". Elderly, adults, women, and children preferred the street's visit due to the several activities occurring at the street and meeting each other. Further, "A spent time inside the street" was significantly related to "The gender of the respondents; their personalities; and professions".

As a result from the above-mentioned relationships, the study proves that Universal Design approach is not present at As-souq street and Aswan city as well. Also, this dissertation confirms that As-souq acts as an important “urban public space” while it does not work as "inclusive street" in Aswan city.

Consequently, the study seeks to improve life quality in urban public spaces in order to achieve high life quality in Aswan city. Hence, use the model of this study as a general one to be applied on other public spaces whether in Egypt or outside.

4.5.2 Direct Observations

The brief of the direct observations of the dissertation can be seen from Table 4.21 below.

Table 4.21 Brief of the observations.

OBSERVATIONS		
Item	**Characteristic**	**Explanation**
Section 1. (*Access* & *linkages*)	AS-Souq Street's Visibility/ Length of the trip	AS-Souq street can be seen from a distance, by reason of its distinguished and central location in Aswan city center which connects "The Train Station Square" northward with "Abbas Farid Street" southward. Also, most of its visitors can reach easily in a short period of time.
	Visitors of As-souq/ Arrival's means	The street's visitors encompass the locals, foreigners, and international tourists. Besides, they can arrive at the street by diverse kinds of transport such as (Bike, motorcycle, bus, minibus, private car, on foot,….etc).
	Difficulties in reaching and entering	Most of the street's visitors encounter many obstacles in reaching and entering As-souq as follows: • Closing some of the street's gates by steel chains. • A traffic jam. • They are inaccessible, inconvenient and ineligible roads which leading to As-souq street. • No parking spaces are existing. • The random parking of diverse species of transport besides the street's gates. • Lots of streets vendors. • The uncomfortable and ineligible street's floor materials in some of the street's sectors. • "Non-standard sidewalks/ pavements" in most sectors • The shortage of the basic qualifications of the street for disabled, urgent patients and elderly. • The overcrowded street.

Table 4.21 (cont'd)

Item	Characteristic	Explanation
Section 2. (Comfort & Image)	Importance of AS-Souq	Locals and tourists feel a strong sense around the unique character, and distinguishing features of AS-Souq street.
	Qualification for all	Even though, the frequent occupancy removal campaigns, and punishment the outlaws and legislations by the municipality, plus the last improvements and modifications which were being achieved within the different sectors of AS-Souq, but this street is considered unqualified and incompetent for all people of different ages and abilities. The obstacles which encountered the street's visitors had been mentioned above in (Difficulties in reaching and entering).
	Outdoor Amenities	• **Benches** and Seats: A few seats are existing in the third sector of AS-Souq street, however, those benches are being used by the shop owners and street vendors, not by the visitors. • **Automated** Teller Machines (**ATM**): They are two inaccessible ATM machines on the second & third sector of As-souq street. • **Public** Telephone, **Mail** Box, **Fire** extinguisher**,** and **Recycling** Bin: No public phones and mailbox are existing at AS-Souq street. Further, there can be a lack of garbage bins and containers in most parts of the street. Also, there is no fire extinguisher at the street. • **Wooden** pergolas and sunshades: Most of the street's sections are covered by sunshades that are made from cloth and textile. Further, wooden pergolas which extend along most of the street's pavements. Also, the street's trees that are apparent intensely in some sectors.
	Allocation the street to pedestrian only & its **division** into 6 sections	Although, allocation most of AS-Souq's sectors just for pedestrian and its division into 6 sectors causes difficulty of entering the urgent services, and difficulty of maintenance works inside the street, but those actions have many advantages for instance: "facilitate walking freely within the street, provide an aesthetic and civilized appearance, decrease the feel of bored, and achieving kind of safety and comfort, support many activities especially tourism sector at the street".

Table 4.21 (cont'd)

	Ramps & Curb Ramps	In spite of the non-standard ramps at the entrances of the street's sectors "gates", but manual one appears at the entrance and exit of the second sector only. Also, I Never had seen curb ramp at AS-Souq street before.
	Accessible sidewalks, pavements & crosswalks	No standard sidewalks/ pavements are existing at the first sector of AS-Souq, whereas, this sector only is allocated to both pedestrian & vehicle. Additionally, there are few inaccessible pavements/ sidewalks at most sectors of the street, however, not all people can benefit from. Also, no crosswalks at "the intersecting streets" with AS-Souq.
	Public Toilets	There is one public toilet at the street's third sector, but it is unqualified for all people with different ages & abilities.
	Sense Of Comfort and Security Presence	Most visitors feel secure, safe and comfortable at As-souq, despite a security presence is shown just at one point of the street.
	Accessible Pedestrian signs, and signals	There is just four accessible signs along the whole street and located inappropriately. Besides, no visible or audible signals are existing at As-souq which indicates to the direction of travel "left or right".
	Prominent Landmarks	AS-Souq has plentiful of prominent landmarks from its beginning to the end for instance (Train station, artworks, and gates)
	Accessible parking	No accessible parking spaces are located in AS-Souq street.
	Billboards	AS-Souq has an abundance of the billboards which display advertisements about: [shop, tourist bazaar, hospital, pharmacy, and cafeteria,..etc]. Some of those billboards can appear clearly through passing the street, while, the other ones unobserved.
	Lighting Elements	In spite of the existence of sufficient lighting elements at the street, but some sectors are illuminating completely while the other sectors complain from the darkness because of closing those lighting elements.

Table 4.21 (cont'd)

	Floor Material	Some of the street's sectors are suffering from unstable, slipping and inconvenient floor materials, whereas, the other sectors' materials are firm, stable, slip resistance and convenient.
Item	**Characteristic**	**Explanation**
Section 3. (*Uses* & *Activities*)	AS-Souq's Visit/ Spent Time/ Species Of Activities	Most visitors come to As-souq street owing to the various species of activities which occur, such as: (shopping, Eating, Walking, Entertainment, ..etc). Besides, As-souq's visitors spend a long time through their trip at the street.
Section 4. (*Sociability*)	Preference of AS-Souq street's visit/	The overwhelming majority of the street's visitors prefer traveling to AS-Souq repeatedly.
	Preference of Accompanying relatives and friends/	Moreover, visitors The street's visitors affirm on their sense of security and safety through the street's visit. Moreover, they prefer to visit the street with their relatives and friends which refer to the great social relationships occurring at the street and its sustainability.
	Recognizing people to each other& Interaction with strangers/	Furthermore, People can interact with the foreigners Spontaneously at AS-Souq street, and they tend to recognize each other easily by face or name.

4.5.3 In-depth Interviews

The study presents the government officials' views, planners, and architects as well, which were concluded by their responses around AS-Souq street. They confirmed the importance of As-souq as commercial, and tourist street, besides being one significant and basic artery at Aswan city. Also, the interviewees mentioned the several activities which occur in As-souq and stated that all those activities are open to everybody.

The interviewees affirmed the non-existence of sufficient seats, but there were a small number of benches just in the third sector of the street which was exploited by hawkers. Also, they mentioned that there were no empty areas at the street to place new seats because of being a commercial street with two fully sides of shops. Moreover, they

explained the deficiency of the basic elements which help different users to benefit from the street easily regardless their ages and abilities, such as (Ramps for the entry of the urgent services; curb ramps when there is a level change; yard,...etc).

The government officials illustrated that the division of the street into 6 sections due to "security precautions, the length of the street, and several intersecting streets with AS-Souq which allocated to vehicles". Additionally, they clarified the advantages of allocating most of the street's sections for pedestrian only which appeared in "facilitating the shopping process, and granting a sense of comfort, safety & security". Also, the street's planning and the existing sidewalks did not take into consideration the various needs of users. Besides, those present sidewalks were exploited by shop owners and hawkers.

The interviewees specified the obstacles which prevent "Accessibility Approach" to be applied at the street as follow: "first, by law the schemes should be reviewed, then, re-planning and repairing deficiencies, but, not enough specialists exist inside the legislative committees of local councils. Also, accessible passageways and sidewalks not taken into account". Furthermore, the officials mentioned that there are no current plans scheduled, and the responsible persons for these legislations are ("The Specialized committees of popular local councils" which submit the proposals with "the executive devices"; and then to "Governor of Aswan").

The proposals of the interviewees about AS-Souq street are represented in "provision of the comprehensive street for all people by making some settings and qualifications which serve all users". For instance: Provision of basic street's furniture, accessible signs, ramps and curb ramps, and accessible sidewalks. Besides, re-planning the street with taking into account the need of all visitors & the shop owners, and re-arrangement the wooden pergolas, also placing one wheelchair at the entrance each gate of AS-Souq. Ultimately, the officials confirmed the important role of architects, planners and locals in planning, designing, and development process.

4.6 Chapter Summary

This chapter encompassed "Five major parts". First of all, "The model of the study" was demonstrated which included "AS-SOUQ Street as a case study". Secondly, the analysis

of the survey's questions was presented. Thirdly, the interviews responses and direct observations were clarified. Followed by, results of statistical analysis of survey questionnaire which was conducted in two phases: "Individually" and "Comparatively" by "Chi-Square Test (X^2)" and "One-Sample T-Test" analysis. Then, "Discussion Of Findings" of this study was illustrated which encompassed "Questionnaire, Observations, and Interviews". Finally, this chapter ended by Its summary.

As underlined by this research, to provide the inclusiveness of street or other urban public space, the necessary intervention should be on the issues of (***Access & Linkages****;* ***Comfort & Image****;* ***Uses & Activities****;* and ***Sociability***).

Regarding "***Access & Linkages***", it is crucial to remove all barriers and difficulties in entering and reaching to the street. In addition, to supply different kinds of mass transportation to facilitate the arrival.

Concerning "***Comfort & Image***", it is significant to provide safety, security and comfort to the user. It is critical also to qualify As-souq street for all people *by providing*: (Enough places to sit and in a comfortable position; Ramps for the entry of urgent services to the street; Accessible sidewalks support the diverse needs of people; Curb ramps when there are level differences; Public toilets in most of the street's sectors; Accessible pedestrian signals and signage; Parking spaces boost the varied needs of people; The billboards and conveniently located; Prominent landmarks; Sufficient lighting elements; and Durable & safe floor materials of the street).

As for "**Uses & Activities**", it is preferable to supply various species of activities at the street which leads to enjoyment and spending more time throughout the visit, and As-souq street already has such those activities.

With regard to "**Sociability**", it is important to foster the association between the street's visitors and each other, also to simplify interaction with strangers, which create a comprehensive and sustainable community for all members. Hence, most of As-souq's users feel of such those social relationships and interactions.

CHAPTER 5

CONCLUSION

Universal design approach places human diversity at the heart of the design process so that buildings, public spaces, and environments can be designed to meet the needs of all users. It, therefore, covers all persons regardless of their age or size and those who have any particular physical, sensory, mental health or intellectual ability or disability. People of diverse abilities all around the world should be able to use buildings and public spaces comfortably and safely, also be capable of finding their way readily, as far as possible without special assistance. Universal design approach caters for the broadest range of users, which can result in buildings, public spaces and environments that can be used and enjoyed by everyone.

Without a doubt, streets are one of the most significant urban public spaces where daily rituals and public life can be experienced. In streets, a different public life is lived. Successful streets themselves are becoming a way of life for local residents. In this regard, this dissertation was set out to examine the universal design principles in streets as public spaces with reference to As-souq street as a case study from Aswan city, Egypt. As-souq can be classified as the main artery of the city since it has a central location, unique character, and special importance for locals and strangers "foreigners" as well. Additionally, the street mainly serves the whole local residents of the city besides being a tourist bazaar and a favorite destination for the tourists. Therefore, As-souq has been selected as a case of this dissertation to be examined in terms of the principles of universal design and the qualities of urban public spaces in order to qualify inclusive street which accommodates all members of the society regardless of the age and ability. In this context, this study explains the 7 principles of universal design, besides indicating to the four main qualities of public spaces.

When it comes to *the research questions*. This dissertation concludes that "Universal Design Approach and its principles" has not yet a mandated, considered or applied to As-souq street and the whole city as well. **It is clear to see** the lack of the key characteristics of "Accessibility and Inclusiveness" which qualifying the street to be usable and eligible for all people regardless of the age and ability. Besides, the non-existence of the basic amenities of "Universal Design for streets and outdoor spaces" such as (accessible pedestrian signage & signals, emergency vehicles access, parking spaces, enough public toilets, curb ramps when there is a difference in levels,...etc). The study believes that the shortage of such those elements is regarded a basic reason for the unavailability of universal design approach and accessibility at this street and the whole city as well, besides the other reasons which related to the implementation and local authorities of the city.

Obviously, As-souq street at Aswan city has a rich cultural and long commercial history. By examining the study's findings, it is obvious that As-souq acts as a significant "Urban public space" while it does not work as "Inclusive street for all people regardless of the age and ability". **It is important to** emphasize that applying Universal Design as a general strategy ensures achieving justice and equality in rights and opportunities for all members of the society. Accordingly, promoting a real participation in the community life. Thus, improving "Life quality" in the urban fabric, public spaces, then society, and finally the whole city as well. By considering just the number of people with disabilities and elderly in Egypt, we can say that it is significant to design at least urban public spaces together with their nearby environments according to the Universal Design principles so that all of them welcome as members of the community in order to form an inclusive society.

As direct observation, interviews and statistical analysis indicate, there can be key characteristics should be taken into consideration when designing every street in light of the principles of universal design such as (Accessible sidewalks which support the diverse needs of all people, crosswalks, accessible pedestrian signals & signage, curb ramps when there is a level difference, clear billboards along the street, emergency vehicles access and accessible ramps, enough parking spaces, and sufficient & suitable lighting elements).

One important aspect of the inclusive urban street design is the availability of different species of "Street's furniture" such as (enough seats, garbage boxes, fire engine,

Accessible Automated Teller Machines "ATM"). Accordingly, the design of an inclusive street should provide such those furniture. Additionally, "The street's floor" is probably one of the significant findings of this study. So, the design of every street should be provided "comfortable, slip-resistance, stable, and durable floor materials".

As can be concluded from the case study, the city streets which have "A considerable history, cultural heritage, unique character, and tourist destination" should be allocated to "Pedestrian-only". Hence, walking freely in the street, achieving kind of safety & comfort, and increasing the rate of the street's visit which leads to raising the street's importance and the commercial movement as well. Consequently, the street which is allocated to pedestrian-only is regarded a desirable place to visit.

Another significant finding of this study, which is prominent, is that the presence of "Sunshades, street trees, and wooden pergolas" at the street. As a consequence, such those street shades should be put into account when designing new streets or developing existing ones, especially in the warm countries. Moreover, "The provision of different kinds of activities" is found to be a substantial aspect for locals and tourists as well. Therefore, every street should contain different types of activities which encourage people to prefer visiting the street, stay a long and nice time, and enjoy their tour at the street.

The case study of this dissertation points out that the lack of "Security presence" is not a related element to "The sense of security" at the street. This means, the non-provision of security presence inside the street has no impact on the sense of security and preferring the street's visit. Hence, there are different elements affect the sense of security at the street such as (Recognizing people each other, interaction with strangers spontaneously, species of activities, and social activities which occurring at the street). To conclude, the better street's design which allows accommodating "All generations, locals & strangers, and kinds of activities" is regarded a safe and preferable place to visit.

Furthermore, the existence of "Accessible public toilets" at the street is found to be an essential element for all visitors of the street and shop owners as well. So, providing such an accessible public toilet for all people regardless of age and ability should be taken into consideration when designing every street.

The presence of "street's vendors/ hawkers" throughout the street is regarded a major threat to the future of the tourism sector in the city. Such those hawkers affect

negatively on the tourists and locals as well. They are disturbing the street's visitors and sometimes become initial reasons of non-preference of the street's visit. In this sense, the municipality and city council should manage such this problem for every street. As a consequence, when designing every street, the needs of visitors and shop owners should be taken into accounts, such as (The size of the shop should be suitable to the displayed goods and products). Accordingly, the pedestrian can benefit from clear sidewalks without barriers at the street.

This study points out that "Physical disabilities, gender differences and age group" are influential factors in the use of the streets as public spaces and public life experiences in those streets, besides their obvious impact on the user's sense of comfort and satisfaction at the space. So, the physical disabilities, gender, and age of the street's users" should be taken into consideration when designing every street.

Furthermore, this dissertation indicates that the development of public spaces reflects a remarkable image for the city, being a central place for friends meeting, spending leisure times or any various activities improve the social environment in the city. Also, streets have to be sustained because communities need more variety of social experiences in the public realm.

In this context, *the 7 principles of Universal Design* contribute in developing *the design of the streets as public spaces*. By implication of those principles in the design process of public spaces that leads to creating "Inclusive urban public spaces" which accommodate seniors' users, adults, children and disabled people as well. By designing for human diversity we can create things that will be easier for the widest range of people to use. Thus, everyone will benefit from UD, which takes into consideration the full range of human diversity, including physical, perceptual and cognitive abilities, and different body sizes and shapes. Everything can be universally designed.

Consequently, people with disabilities can "live in the community without being discriminated from the social life; engage the social activities; enjoy their built environment; receive services equally; utilize outdoor spaces, and use buildings easily". Furthermore, people who have no disabilities have to think universally for the surrounding environments. They should know that the universal design for products, buildings, public spaces, and whole environments are much better than the current situation.

A large number of streets and public spaces are existing in and around Aswan city. Therefore, it is essential for urban design to determine the basic elements which prevent the application of universal design principles and accessibility approach in streets and urban public spaces throughout the city and outside as well. By exploring all those key elements in an attempt to get rid of them and to find solutions to authorize applying Universal Design approach widely. Also, by simplifying the inclusive design of streets and urban public spaces which lead to getting a better urban life that overcomes social segregation.

- **Contributions and Recommendations**

This study will be a significant resource and valuable guide in Egypt in order to understand and apply UD approach for streets and outdoor public spaces to be usable and convenient for all people regardless of the ability and age. Moreover, it emphasizes that through the implementation of Universal Design as a strategy which ensures equal and democratic rights in society for all people regardless of age and ability. Therefore, encouraging full participation in the life of the community by ensuring access to all aspects of the society, including the built environment, transport, products and goods, public services,...etc. Consequently, improving "Quality of life" in the urban fabric and the whole community as well.

This *study contributes* to arouse interest in the principles of Universal Design and to draw the attention of the specialists of the government, architects, and planners, in order to understand and implement the principles of Universal Design in all urban public spaces to be usable and convenient for all people whatever their abilities or ages. In addition, to raising the performance of design for a wide range of users. Through the in-depth interviews, the study asks from the officials and designers to rethink in some essential formal architectural concepts, to consider equity between different species of users especially disabled people, children and elderly.

As architects, we have to think universally towards the future, we also have to do our role which represented in achieving good design in the light of the Universal Design principles so that all people can access, use, and understand the public spaces, buildings, and environments to the greatest extent and in the most independent and natural manner possible, without the need for adaptations or specialised solutions. Architects also have to take into account that Universal Design concept and principles boost full integration

for each member of the society, and create universal spaces or places for everyone. As for landscape architects, engineers, city planners, and designers, they have to create friendly, welcoming public spaces and environments which embracing universal design as an essential element, besides they have to convince the government to apply the requirements of the Universal Design principles.

The study's findings can serve as a guide for the commercial sector that aims to understand the significance of universal design for its future investments. This research could also help in raising the rate of success of commercial streets concerning meet the visitors needs at such those streets. For instance, the availability of mass transportation to the street, provision of security, removal of physical barriers, provision of accessible street furniture, ...etc. Such those examples can be re-evaluated according to statistical figures obtained as results of this study.

This dissertation participates in attracting local government attention in order to legislate policies and laws that aim to manage, maintain existing streets and public spaces and make them inclusive for all people. These policies should support the provision of an increasing number of inclusive streets and urban public spaces in the near future. Additionally, local authority "municipalities'" need to develop awareness around Universal design approach and its principles. Likewise, improving the design process in accessibility and flexibility of streets. Also, there is an essential need to pay more attention to the considerations of the users' diversity and their abilities at the urban design level.

- **Future Research**

"Universal Design" approach introduced in this dissertation provides *a natural guide to future research*. UD is a new domain in Architecture in our country Egypt, and Aswan city too. Accordingly, for future work, Universal Design approach and its principles could be studied intensely in several architectural fields. Thereafter, research on the domain of UD will gradually move to deeper levels. For instance, this study aims to evaluate As-souq street as an urban public space in light of the principles of Universal Design (UD). In this sense, the principles of UD can be applied to other streets or urban public spaces in Aswan city or different locations around the world in order to improve a life quality of public spaces widely and in Aswan city as well.

Furthermore, As-souq street can be compared not only with another street at Aswan but also with another type of urban public spaces in the city such as "Park, plaza, recreational space or central boulevard". In this regard, the concentration of future research can be expanded to cover a public space in Aswan. Depending on this comparison the problems of different types of public spaces can be specified to the executive authorities that are responsible for developing and maintaining those public spaces. Additionally, the criteria of this study (access & linkage, comfort & image; uses & activities; and sociability) can be developed in light of Universal Design Principles.

Additionally, the theoretical model of this dissertation and the structure of the case study can be applied to other cases not only inside Aswan city but also outside. Hence, some proposals can be evolved to boost the inclusive design approach in streets and urban public spaces (UPS).

Moreover, the assessment of street design with universal design principles in this dissertation can gradually move to deeper levels, and be extended in several ways. One possible extension is to examine "Outdoor sidewalks and walkways" in terms of widths, slopes, plus the surface of all pathways. Then, preparing statistical measures for those elements. The second extension is to investigate "Crosswalks/ Street Crossings" with regard to "The suitable location, right angles to one another, and obstacles encountered such as light elements, traffic signal supports, and garbage boxes". A third extension is to examine a plan and elevation of "The Accessible Toilet" with reference to the convenient dimensions to accommodate all users, also the facilities of this toilet. The fourth possible extension is to study "Outdoor amenities" at the street such as "Street's furniture, lighting elements, signage, seats and accessible pedestrian signals" in terms of the better location at the street, suitable materials, size, traditional style, the requested number of those amenities along the street.

This dissertation can be used also as a director of future research in universal design for interior spaces of buildings. At Aswan city, almost all interior spaces of buildings are not qualified to accommodate all users regardless of age, size and ability. For examples, houses we live in, schools we study in, governmental buildings we go to,...etc. Therefore, the interior spaces should be universally designed with the outdoor ones. So, for future works, Universal design principles can be addressed and applied to interior spaces of buildings at the city and outside as well. Consequently, getting universally designed environments.

Besides, this study can also provide a guide to future research in the tourism sector of the city. Since Aswan is regarded a tourist city in "The Arab Republic Of Egypt". Therefore, the city abounds different kinds of tourist buildings such as "Hotels, floating hotels "Nile cruise ships", tourist outdoor spaces, and tourist villages,...etc". So, for future works, universal design principles could be applied to such those buildings and outdoor spaces which lead to creating inclusive, usable and legible tourist buildings for all users whether locals or tourists. Thus, getting tourism buildings which are universally designed to accommodate all users.

As interviews, observations and survey findings indicate that many elderly users and adults come to As-souq to meet their friends. So, social factors influencing seniors' usage should be addressed in future research. Senior people tend to have more leisure time and a less active social life compared with other populations; these factors may influence the street use. A better grasp of how social events may influence users' activities inside the street, and can help in attracting more people to the street.

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APPENDIX-A

SIGNIFICANT RELATIONS & CROSS-TABULATION

❑ Significant Relations By "One-Sample T-Test" Analyses For AS-Souq street

In this part of the evaluation results, "One-Sample T-Tests" were conducted for the following four questions: ["As-souq's visit is preferable for you (Q33)"; "Walking with relatives & friends is a desirable activity (Q34)"; "Knowing people by face or name is spontaneously happened (Q35)"; "Interaction with strangers is done easily (Q36)"]. The main goal of this test is to understand the extent of satisfaction of As-souq's users about those mentioned questions.

The "One-Sample T Test" is statistically significant for these next 4 questions. As shown by (Table A.1), the 330 respondents who were surveyed had a significantly favorable of "AS-Souq street's visit (Q33)", t(329) = 18.073, P = .000. Also, they had a significantly **favorable** of "Walking with relatives & friends (Q34)", t(329) = 10.510, P = .000, (see Table A.2). As for (Question 35), respondents had a significantly **favorable** of "Knowing people by face (Q35)", t(329) = 11.201, P = .000, (see Table A.3). Additionally, respondents had a significantly favorable of "Interaction with foreigners/ strangers (Q36)", t(329) = 4.168, P = .000, (see Table A.4).

Table A. 1 One-Sample T Test for [As-souq's visit is preferable for you (Q33)], (The Author by "SPSS" program).

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
As-souq's visit is preferable&desirable	18.073	329	.000	1.318	1.17	1.46

t(329) = 18.073, P = .000

Table A. 2 One-Sample T Test for [Walking with relatives & friends (Q34)], (The Author by "SPSS" program).

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Walking with relatives and friends is favorable	10.510	329	.000	.888	.72	1.05

t(329) = 10.510, P = .000

Table A. 3 One-Sample T Test for [Knowing people by "face or name (Q35)], (The Author by "SPSS" program).

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Knowing people by "face or name" is happened easily.	11.201	329	.000	.964	.79	1.13

t(329) = 11.201, P = .000

Table A. 4 One-Sample T Test for [Interaction with foreigners/ strangers (Q36)], (The Author by "SPSS" program).

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Interaction with foreigners is done simply.	4.168	329	.000	.397	.21	.58

t(329) = 4.168, P = .000

- **Cross-Tabulations for Significant Relations in X^2 Analyses for AS-Souq street**

Table A. 5 "The arrival to AS-Souq street (Q10)" versus "Gender (Q1)", (The Author by "SPSS" program).

Did you arrive at the street easily?		Gender: Male or Female		Total
		Male	Female	
	no	161	42	203
	yes	98	29	127
Total		259	71	330

X^2 (1, N = 330) = .213, P = .645

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.213a	1	.645		
Continuity Correctionb	.105	1	.746		
Likelihood Ratio	.212	1	.645		
Fisher's Exact Test				.681	.371
Linear-by-Linear Association	.212	1	.645		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 27.32.
b. Computed only for a 2x2 table

Table A. 6 "Arrival to the street(Q10)" versus "User Profile(Q2)", "SPSS".

Did you arrive at the street easily?		User Profile				Total
		visitor	shop owner	architect or planner	government official	
	no	62	50	49	42	203
	yes	48	60	6	13	127
Total		110	110	55	55	330

X^2 (3, N = 330) = 36.007, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.007a	3	.000
Likelihood Ratio	39.467	3	.000
Linear-by-Linear Association	15.478	1	.000
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 21.17.

Table A. 7 "The arrival to the street(Q10)" versus "Age Group(Q3)", (Author by SPSS).

Did you arrive at the street easily?		Age Group				Total
		10 to 25	25 to 40	40 to 65	over than 65	
	no	24	83	89	7	203
	yes	12	64	37	14	127
Total		36	147	126	21	330

X^2 (3, N = 330) = 13.460, P = .004

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.460a	3	.004
Likelihood Ratio	13.373	3	.004
Linear-by-Linear Association	.105	1	.745
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.08.

Table A. 8 "The arrival to the street(Q10)" versus "physical disability(Q6)", (Author).

Did you arrive at the street easily?		Is there "Physical Disability"?		Total
		none	yes	
	no	168	35	203
	yes	120	7	127
Total		288	42	330

X^2 (1, N = 330) = 9.677, P = .002

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9.677a	1	.002		
Continuity Correctionb	8.650	1	.003		
Likelihood Ratio	10.754	1	.001		
Fisher's Exact Test				.002	.001
Linear-by-Linear Association	9.648	1	.002		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 16.16.
b. Computed only for a 2x2 table

Table A. 9 "Difficulties in entering AS-Souq street(Q11)" versus "Gender (Q1)", (The Author by "SPSS" program).

Do you confront any difficulties in entering AS-Souq?		**Gender: Male or Female**		
		Male	**Female**	**Total**
	no	125	22	147
	yes	134	49	183
Total		259	71	330

X^2 (1, N = 330) = 6.733, P = .009.

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.733a	1	.009		
Continuity Correctionb	6.052	1	.014		
Likelihood Ratio	6.908	1	.009		
Fisher's Exact Test				.010	.006
Linear-by-Linear Association	6.713	1	.010		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.63.
b. Computed only for a 2x2 table

Table A. 10 "Difficulties in entering AS-Souq (Q11)" versus "User Type(Q2)", (The Author by "SPSS" program).

Do you confront any difficulties in entering As-souq?		User Type				Total
		Visitor	Shop owner	Architect / planner	Governmen t official	
	no	40	81	9	17	147
	yes	70	29	46	38	183
Total		110	110	55	55	330

X^2 (3, N = 330) = 62.489, P = .000.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	62.489a	3	.000
Likelihood Ratio	65.392	3	.000
Linear-by-Linear Association	4.964	1	.026
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 24.50.

Table A. 11 "Difficulties in entering AS-Souq (Q11)" versus "Age group(Q3)", (The Author by "SPSS" program).

Do you confront any difficulties in entering the street?		Age Group				Total
		10 to 25	25 to 40	40 to 65	over than 65	
	no	14	64	54	15	147
	yes	22	83	72	6	183
Total		36	147	126	21	330

X^2 (3, N = 330) = 6.816, P = .078

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.816a	3	.078
Likelihood Ratio	6.885	3	.076
Linear-by-Linear Association	2.620	1	.105
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.35.

Table A. 12 "Difficulties in entering AS-Souq (Q11)" & "Physical disabilities(Q6)",

Do you confront any difficulties in entering the street?		Is there "Physical Disability"?		Total
		none	yes	
	no	132	15	147
	yes	156	27	183
Total		288	42	330

X^2 (1, N = 330) = 1.519, P = .218

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.519a	1	.218		
Continuity Correctionb	1.137	1	.286		
Likelihood Ratio	1.544	1	.214		
Fisher's Exact Test				.247	.143
Linear-by-Linear Association	1.515	1	.218		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.71.

Table A. 13 "Importance of AS-Souq street (Q13)" versus "Gender(Q1)". (SPSS).

Do you feel that AS-Souq street has a unique character?		Gender: Male or Female		Total
		Male	Female	
	No	10	2	12
	Yes	249	69	318
Total		259	71	330

X^2 (1, N = 330) = .173, P = .677

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.173a	1	.677		
Continuity Correctionb	.003	1	.953		
Likelihood Ratio	.184	1	.668		
Fisher's Exact Test				1.000	.503
Linear-by-Linear Association	.173	1	.678		
N of Valid Cases	330				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 2.58.

Table A. 14 "Importance of AS-Souq (Q13)" versus "User Type(Q2)", (The Author by "SPSS" program).

Do you feel that AS-Souq has a unique character?	User Type				Total
	Visitor	Shop owner	Architect/ planner	Governmen t official	
No	9	1	2	0	12
Yes	101	109	53	55	318
Total	110	110	55	55	330

X^2 (3, N = 330) = 10.896, P = .012

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.896a	3	.012
Likelihood Ratio	12.222	3	.007
Linear-by-Linear Association	6.132	1	.013
N of Valid Cases	330		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 2.00.

Table A. 15 "Importance of AS-Souq street (Q13)" versus "Age group(Q3)", (The Author by "SPSS" program).

Do you feel that AS-Souq street has a unique character?	Age Group				Total
	10 to 25	25 to 40	40 to 65	Over than 65	
No	1	7	2	2	12
Yes	35	140	124	19	318
Total	36	147	126	21	330

X^2 (3, N = 330) = 4.194, P = .241

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.194a	3	.241
Likelihood Ratio	3.926	3	.270
Linear-by-Linear Association	.006	1	.939
N of Valid Cases	330		

a. 3 cells (37.5%) have expected count less than 5. The minimum expected count is .76.

Table A. 16 "Qualification of AS-Souq for all people(Q14)" versus "gender (Q1)", (The Author by "SPSS" program).

Is the street qualified for all people?		Gender: Male or Female		Total
		Male	Female	
	no	222	63	285
	yes	37	8	45
Total		259	71	330

X^2 (1, N = 330) = .431, P = .511

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.431a	1	.511		
Continuity Correctionb	.213	1	.645		
Likelihood Ratio	.448	1	.503		
Fisher's Exact Test				.696	.330
Linear-by-Linear Association	.430	1	.512		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.68.

Table A. 17 "Qualification of AS-Souq for all(Q14)" versus "User Profile(Q2)", "SPSS"

Is the street qualified for all people?	User Profile				Total
	Visitor	Shop owner	Architect or planner	Governmen t official	
no	103	81	52	49	285
yes	7	29	3	6	45
Total	110	110	55	55	330

X^2 (3, N = 330) = 23.544, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.544a	3	.000
Likelihood Ratio	22.679	3	.000
Linear-by-Linear Association	.006	1	.940
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.50.

Table A. 18 "Qualification of AS-Souq for all people(Q14)" versus "Age Group(Q3)", (The Author by "SPSS" program).

Is the street qualified for all people?		Age Group				Total
		10 to 25	25 to 40	40 to 65	Over than 65	
	no	32	124	112	17	285
	yes	4	23	14	4	45
Total		36	147	126	21	330

X^2 (3, N = 330) = 1.904, P = .593

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.904a	3	.593
Likelihood Ratio	1.886	3	.596
Linear-by-Linear Association	.000	1	1.000
N of Valid Cases	330		

a. 2 cells (25.0%) have expected count less than 5. The

Table A. 19 "Qualification of AS-Souq for all (Q14)" versus "The existence of a physical disability(Q6)", (The Author by "SPSS" program).

Is the street qualified for all people?		Is there "Physical Disability"?		Total
		None	Yes	
	no	244	41	285
	yes	44	1	45
Total		288	42	330

X^2 (1, N = 330) = 5.177, P = .023

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.177a	1	.023		
Continuity Correctionb	4.140	1	.042		
Likelihood Ratio	7.193	1	.007		
Fisher's Exact Test				.027	.012
Linear-by-Linear Association	5.161	1	.023		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.73.

Table A. 20 "Allocating most of the street's sectors for pedestrian only(Q17)" versus"User Type(Q2)", (The Author by "SPSS" program).

Do you agree with "Allocating the street's sections" for a pedestrian?		User Type				Total
		Visitor	Shop owner	Architect / planner	Government official	
	No	19	29	22	17	87
	Yes	91	81	33	38	243
Total		110	110	55	55	330

X^2 (3, N = 330) = 10.536, P = .015

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.536a	3	.015
Likelihood Ratio	10.511	3	.015
Linear-by-Linear Association	6.918	1	.009
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The

Table A. 21 "Allocation As-souq street for pedestrian only (Q17)" versus"Age group(Q3)", (The Author by "SPSS" program).

Do you agree with "Allocating the street's sections for pedestrian only?		Age Group				Total
		10 to 25	25 to 40	40 to 65	Over than 65	
	no	6	48	32	1	87
	yes	30	99	94	20	243
Total		36	147	126	21	330

X^2 (3, N = 330) = 9.847, P = .020

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.847a	3	.020
Likelihood Ratio	11.710	3	.008
Linear-by-Linear Association	1.229	1	.268
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.54.

Table A. 22 "Allocation As-souq street for pedestrian only (Q17)" versus "physical disabilities(Q6)", (The Author by "SPSS" program).

Do you agree with "Allocating the street" sections to pedestrian only?		Is there "Physical Disability"?		Total
		None	Yes	
	no	74	13	87
	yes	214	29	243
Total		288	42	330

X^2 (1, N = 330) = .522, P = .470

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.522a	1	.470		
Continuity Correctionb	.286	1	.593		
Likelihood Ratio	.507	1	.476		
Fisher's Exact Test				.459	.291
Linear-by-Linear Association	.520	1	.471		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.07.

Table A. 23 Durability and safety of AS-Souq street's floor material (Q29)" versus "User Type(Q2)", (The Author by "SPSS" program).

Do you feel that “The Floor Material" are safe & durable?		User Type				Total
		Visitor	Shop owner	Architect / planner	Government official	
	no	81	43	43	48	215
	yes	29	67	12	7	115
Total		110	110	55	55	330

X^2 (3, N = 330) = 52.360, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	52.360a	3	.000
Likelihood Ratio	52.943	3	.000
Linear-by-Linear Association	5.741	1	.017
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5.

Table A. 24 "Durability & safety of AS-Souq's floor material (Q29)" versus "Physical Disability(Q6)", (The Author by "SPSS" program).

Do you feel that "The Floor Material" are safe and durable?		Is there "Physical Disability"?		Total
		None	Yes	
	no	180	35	215
	yes	108	7	115
Total		288	42	330

X^2 (1, N = 330) = 7.007, P = .008

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.007a	1	.008		
Continuity Correctionb	6.120	1	.013		
Likelihood Ratio	7.785	1	.005		
Fisher's Exact Test				.009	.005
Linear-by-Linear Association	6.986	1	.008		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.64.

Table A. 25 "Ramps for the urgent services' entry to AS-Souq (Q18)" versus "User Type (Q2)", (The Author by "SPSS" program).

Are there "Ramps" for the entry of urgent services to the street?		User Type				Total
		Visitor	Shop owner	Architect / planner	Government official	
	no	71	23	47	47	188
	yes	39	87	8	8	142
Total		110	110	55	55	330

X^2 (3, N = 330) = 97.334, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	97.334a	3	.000
Likelihood Ratio	103.948	3	.000
Linear-by-Linear Association	16.179	1	.000
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5.

Table A. 26 "Ramps for the urgent services' entry to AS-Souq(Q18)" versus "physical disability(Q6)", (The Author by "SPSS" program).

Are there "Ramps" for the entry of urgent services to the street?		Is there "Physical Disability"?		Total
		None	Yes	
	no	156	32	188
	yes	132	10	142
Total		288	42	330

X^2 (1, N = 330) = 7.253, P = .007

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.253a	1	.007		
Continuity Correctionb	6.382	1	.012		
Likelihood Ratio	7.688	1	.006		
Fisher's Exact Test				.007	.005
Linear-by-Linear Association	7.231	1	.007		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18.07.

Table A. 27 "Accessible pedestrian signals & signage at AS-Souq (Q24)" versus"User Type(Q2)", (The Author by "SPSS" program).

Are there "Accessible Pedestrian Signals"?		User Type				Total
		Visitor	Shop owner	Architect/ planner	Government official	
	no	98	77	49	50	274
	yes	12	33	6	5	56
Total		110	110	55	55	330

X^2 (3, N = 330) = 19.980, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.980a	3	.000
Likelihood Ratio	18.946	3	.000
Linear-by-Linear Association	.536	1	.464
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5.

Table A. 28 "Accessible pedestrian signals & signage at AS-Souq (Q24)" versus "physical disability(Q6)", (The Author by "SPSS" program).

Are there "Accessible Pedestrian Signals"?		Is there "Physical Disability"?		Total
		None	Yes	
	no	238	36	274
	yes	50	6	56
Total		288	42	330

X^2 (1, N = 330) = .246, P = .620

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.246a	1	.620		
Continuity Correctionb	.076	1	.783		
Likelihood Ratio	.256	1	.613		
Fisher's Exact Test				.826	.405
Linear-by-Linear Association	.245	1	.620		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.13.

Table A. 29 "Public toilets at AS-Souq street (Q21)" versus "Gender(Q1)", (SPSS).

Are there "public toilets" in most of AS-Souq's sectors?		Gender: Male or Female		Total
		Male	Female	
	no	204	54	258
	yes	55	17	72
Total		259	71	330

X^2 (1, N = 330) = .240, P = .625

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.240a	1	.625		
Continuity Correctionb	.107	1	.743		
Likelihood Ratio	.236	1	.627		
Fisher's Exact Test				.629	.366
Linear-by-Linear Association	.239	1	.625		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.49.

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.240a	1	.625		
Continuity Correctionb	.107	1	.743		
Likelihood Ratio	.236	1	.627		
Fisher's Exact Test				.629	.366
Linear-by-Linear Association	.239	1	.625		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.49.

Table A. 30 "Public toilets at AS-Souq street (Q21)" versus "User Type(Q2)", (The Author by "SPSS" program).

Are there "public toilets" in most sectors?		User Type				Total
		Visitor	Shop owner	Architect/ planner	Governmen t official	
	no	92	80	40	46	258
	yes	18	30	15	9	72
Total		110	110	55	55	330

X^2 (3, N = 330) = 5.756, P = .124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.756a	3	.124
Likelihood Ratio	5.805	3	.121
Linear-by-Linear Association	.140	1	.708
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.00.

Table A. 31 "public toilets at AS-Souq street (Q21)" versus "Physical Disability(Q6)",

Are there "public toilets" in most sectors?		Is there "Physical Disability"?		Total
		None	Yes	
	no	226	32	258
	yes	62	10	72
Total		288	42	330

X^2 (1, N = 330) = .112, P = .738

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.112a	1	.738		
Continuity Correctionb	.018	1	.893		
Likelihood Ratio	.110	1	.740		
Fisher's Exact Test				.694	.436
Linear-by-Linear Association	.112	1	.738		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.16.
b. Computed only for a 2x2 table

Table A. 32 "Sense of comfort & safety at AS-Souq street(Q22)" versus "Security presence(Q23)", (The Author by "SPSS" program).

Do you feel comfortable and safe on the street?		**Is there a security presence?**		
		No	**Yes**	**Total**
	no	105	5	110
	yes	93	127	220
Total		198	132	330

X^2 (1, N = 330) = 86.420, P = .000

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	86.420a	1	.000		
Continuity Correctionb	84.219	1	.000		
Likelihood Ratio	103.799	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	86.159	1	.000		
N of Valid Cases	330				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 44.00.
b. Computed only for a 2x2 table

Table A. 33 "Frequency of visit (Q30)" versus "gender (Q1)", (The Author by "SPSS"

Gender: Male or Female	How frequently have you been visiting As-souq street?				Total
	Less than 10	From 10 to 25	Every day/ Daily	Throughout the visit	
male	54	33	170	2	259
female	29	12	27	3	71
Total	83	45	197	5	330

X^2 (3, N = 330) = 21.066, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.066a	3	.000
Likelihood Ratio	19.891	3	.000
Linear-by-Linear Association	11.983	1	.001
N of Valid Cases	330		

a. 2 cells (25.0%) have expected count less than 5.

Table A. 34 "Frequency of visit (Q30)" versus "Age group (Q3)",

Age group	How frequently have you been visiting this street?				Total
	Less than 10	From 10 to 25	Every day or Daily	Throughout the visit	
10 to 25	8	8	20	0	36
25 to 40	41	13	91	2	147
40 to 65	30	22	74	0	126
over than 65	4	2	12	3	21
Total	83	45	197	5	330

X2 (9, N = 330) = 32.345, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.345a	9	.000
Likelihood Ratio	20.278	9	.016
Linear-by-Linear Association	.727	1	.394
N of Valid Cases	330		

a. 6 cells (37.5%) have expected count less than 5.

Table A. 35 "Frequency of visit (Q30)" versus "Profession (Q5)", (The Author by "SPSS" program).

Profession/occupation	How frequently have you been visiting this street?				Total
	Less than 10	From 10 to 25	Every day/ Daily	Throughout the visit	
Employee	21	9	20	1	51
Student	3	3	8	0	14
Self-employed	4	2	120	0	126
Professional	2	2	4	0	8
Housewife	8	2	1	2	13
Retired/ Unemployed	2	4	0	2	8
Architect or Planner	16	10	29	0	55
Government Official	27	13	15	0	55
Total	83	45	197	5	330

X2 (21, N = 330) = 178.033, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	178.033a	21	.000
Likelihood Ratio	169.705	21	.000
Linear-by-Linear Association	20.120	1	.000
N of Valid Cases	330		

a. 18 cells (56.3%) have expected count less than 5. The minimum expected count is .12.

Table A. 36 "Spent time inside AS-Souq street (Q31)" versus "Gender (Q1)", (The Author by "SPSS" program).

Gender: Male or Female	How long do you usually spend on this street?				Total
	Just pass through it	Around half an hour	More than one hour	All-day	
male	46	47	61	105	259
female	16	21	25	9	71
Total	62	68	86	114	330

X^2 (3, N = 330) = 19.641, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.641a	3	.000
Likelihood Ratio	22.139	3	.000
Linear-by-Linear Association	10.628	1	.001
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.34.

Table A. 37 "Spent time inside AS-Souq street (Q31)" versus "User Type (Q2)", (The Author by "SPSS" program).

	How long do you usually spend on this street?				
User Type	**Just pass through it**	**Around half an hour**	**More than one hour**	**All-day**	**Total**
visitor	24	31	51	4	110
shop owner	0	0	0	110	110
Architect/ planner	15	17	23	0	55
government official	23	20	12	0	55
Total	62	68	86	114	330

X^2 (9, N = 330) = 330.558, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	330.558a	9	.000
Likelihood Ratio	403.157	9	.000
Linear-by-Linear Association	17.614	1	.000
N of Valid Cases	330		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.33.

Table A. 38 "Spent time inside AS-Souq street (Q31)" versus "Profession (Q5)", (The Author by "SPSS" program).

Profession/occupation	How long do you usually spend on this street?				Total
	Just pass through it	Around half an hour	More than one hour	All-day	
Employee	12	14	24	1	51
Student	2	4	8	0	14
Self-employed	4	4	6	112	126
Professional	1	2	5	0	8
Housewife	4	4	4	1	13
Retired/ unemployed	1	3	4	0	8
Architect or planner	15	17	23	0	55
Government official	23	20	12	0	55
Total	62	68	86	114	330

X^2 (21, N = 330) = 289.325, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	289.325a	21	.000
Likelihood Ratio	336.416	21	.000
Linear-by-Linear Association	55.096	1	.000
N of Valid Cases	330		

a. 16 cells (50.0%) have expected count less than 5. The minimum expected count is 1.50.

Table A. 39 "preference of visit (Q33)" versus "Gender (Q1)", (The Author by "SPSS).

The street's visit is preferable & desirable for you	Gender: Male/ Female		Total
	Male	Female	
Strongly Disagree	20	1	21
Slightly Disagree	33	8	41
Neutral	1	3	4
Slightly Agree	7	3	10
Strongly Agree	198	56	254
Total	259	71	330

X^2 (4, N = 330) = 10.833, P = .029

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.833a	4	.029
Likelihood Ratio	10.462	4	.033
Linear-by-Linear Association	1.331	1	.249
N of Valid Cases	330		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .86.

Table A. 40 "preference of visit (Q33)" versus "User Type (Q2)", (The Author by "SPSS" program).

The street visit is preferable & desirable for you.	User Type				Total
	Visitor	Shop owner	Architect/ planner	Government official	
Strongly Disagree	5	5	5	6	21
Slightly Disagree	10	18	7	6	41
Neutral	3	0	1	0	4
Slightly Agree	2	3	2	3	10
Strongly Agree	90	84	40	40	254
Total	110	110	55	55	330

X^2 (12, N = 330) = 12.583, P = .400

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.583a	12	.400
Likelihood Ratio	13.603	12	.327
Linear-by-Linear Association	2.365	1	.124
N of Valid Cases	330		

a. 10 cells (50.0%) have expected count less than 5. The minimum expected count is .67.

Table A. 41 "preference of visit (Q33)" versus "Age group (Q3)"

The street's visit is preferable & desirable for you.	Age Group				Total
	From 10 to 25	From 25 to 40	From 40 to 65	Over than 65	
Strongly Disagree	1	6	13	1	21
Slightly Disagree	5	11	25	0	41
Neutral	0	2	2	0	4
Slightly Agree	1	6	3	0	10
Strongly Agree	29	122	83	20	254
Total	36	147	126	21	330

X^2 (12, N = 330) = 22.148, P = .036

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.148a	12	.036
Likelihood Ratio	25.558	12	.012
Linear-by-Linear Association	3.019	1	.082
N of Valid Cases	330		

a. 12 cells (60.0%) have expected count less than 5. The minimum expected count is .25.

Table A. 42 "preference of visit (Q33)" versus "Diversity of Activities (Q32)", (The Author by "SPSS" program).

The street visit is preferable & desirable for you.	Are there different types of activities occurring at As-souq?		Total
	No	Yes	
Strongly Disagree	3	18	21
Slightly Disagree	2	39	41
Neutral	1	3	4
Slightly Agree	0	10	10
Strongly Agree	21	233	254
Total	27	303	330

X^2 (4, N = 330) = 4.037, P = .401

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.037a	4	.401
Likelihood Ratio	4.286	4	.369
Linear-by-Linear Association	.058	1	.809
N of Valid Cases	330		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is .33.

Table A. 43 "Preference of walking with relatives & friends (Q34)" versus "Gender(Q1)", (The Author by "SPSS" program).

Walking with relatives & friends is favorable	**Gender: Male or Female**		**Total**
	Male	**Female**	
Strongly Disagree	31	1	32
Slightly Disagree	62	9	71
Neutral	2	1	3
Slightly Agree	15	5	20
Strongly Agree	149	55	204
Total	259	71	330

X^2 (4, N = 330) = 13.669, P = .008

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.669a	4	.008
Likelihood Ratio	16.655	4	.002
Linear-by-Linear Association	12.784	1	.000
N of Valid Cases	330		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is .65.

Table A. 44 "Preference of walking with relatives & friends (Q34)" versus "Age group (Q3)", (The Author by "SPSS" program).

Walking with relatives & friends is favorable	Age Group				Total
	From 10 to 25	From 25 to 40	From 40 to 65	Over than 65	
Strongly Disagree	1	13	18	0	32
Slightly Disagree	6	15	48	2	71
Neutral	1	1	1	0	3
Slightly Agree	0	11	8	1	20
Strongly Agree	28	107	51	18	204
Total	36	147	126	21	330

X^2 (12, N = 330) = 53.292, P = .000

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	53.292a	12	.000
Likelihood Ratio	57.872	12	.000
Linear-by-Linear Association	10.524	1	.001
N of Valid Cases	330		

a. 9 cells (45.0%) have expected count less than 5. The minimum expected count is .19.

APPENDIX-B

SURVEY QUESTIONNAIRE

Survey Questionnaire

(AS-Souq Street)/ Saad Zaghlol St., Aswan, Egypt

Mai Eid Khalil Ahmed
Lecturer Assistant at Aswan University, Aswan, Egypt
Also, Ph.D. Student at Yildiz Technical University,
Faculty of Architecture,
Department of Architecture,
Architectural Design Program, Istanbul, Turkey
e-mail: maieid63@yahoo.com

Date: _____

(User Profile)

1. Gender: □ Male □ Female
2. Personality/ Identity: □ Visitor □ Shop Owner □ Architect **or** Planner □ Government Official
3. Age Group: □10-25 □ 25-40 □ 40-65 □ Over than 65
4. Level of Education: □ none □ Primary □ preparatory □ Secondary □ Undergraduate □ Graduate □ Postgraduate □ PhD
5. Profession/occupation _____
6. Physical Disability: □ None □ If yes:_____

Section 1. (*Access & Linkages*)

7. Can you see AS-Souq street from a distance? □ Yes □ No
8. From which district or city did you come to the street?_____
9. How did you arrive at the street?

   □On foot □Private car □Bike/motorcycle □Mass transport

   __Bus
   __Minibus
   __Taxi
   __Train
   __Boat/ Sailboat
10. Did you arrive at the street easily?□Yes □If No, What are the difficulties in reaching the street? □ There is no pedestrian crossing close to the street

    □ Sidewalks are not good enough or not existing
    □ There are no pedestrian paths available
    □ The street floors are not qualified well
    □ There are physical disabilities
    □ Traffic Jam
    □ Inconvenient Roads
    □ Insufficient parking
    □ Waiting period for buses or minibusses
    □ There are no bus stops close to the street

11. Do you confront any difficulties in entering the street? □No □Yes,
12. How long did your trip take? (in minutes) _____

Section 2. (*Comfort & Image*)

13. Do you feel that AS-Souq street has a unique character & special importance for residents and tourists as well? □no □ yes, Do you feel that you are in Aswan when you are in? □ yes □ no
14. Is the street qualified for all people of different ages and abilities: (disabled people, elderly, and children)? □Yes □ No,
15. Are there enough places to sit on the street?□No, □If yes, Are seats conveniently located?□ yes □no
16. Do you agree with dividing the street into "Six sectors" by a number of new gates? □ yes □ no,
17. Do you agree with allocating most of the street sections for pedestrian only? □Yes □ No

18. Are there ramps for the entry of urgent services to the street: "Ambulance, fire-engine and security forces"? □Yes □No
19. Are there accessible sidewalks support the diverse needs of people of all abilities? □Yes □No
20. Are there Curb ramps provided when there is a level difference? □Yes □No

***(Curb ramp**): Sloped area cut into the curb.

21. Are there public toilets in most sectors of the street? □no □If yes, Do they consider the needs of all users of different ages and abilities?□yes □no
22. Do you feel comfortable and safe at the street? □yes □no
23. Is there a security presence? □Yes □No
24. Are there Accessible Pedestrian Signals and signage at this street? □Yes □No
25. Are there any prominent landmarks to remember the street and its location?□No □If, yes, mention it:_____
26. Are "parking spaces " provided at the street? □No, □If yes, Do they consider the needs of all car users? □yes □No
27. Do you clearly notice the billboards through passing the street? □yes □no
28. Are there sufficient Lighting Elements at the street? □yes □no
29. Do you feel that "The Floor Material" of the street are safe and durable?□yes □ no

Section 3. (*Uses & Activities*)

30. How frequently have you been visiting this street?(Average times per month) _____
31. How long do you usually spend at this street? □ Just pass through it
    □ Around half an hour
    □ More than one hour
    □ All-day
32. Are there different types of activities occurring at the street? □No, □If Yes, Kind of the activities: □ Walking
    □ Shopping
    □ Eating or having a meal
    □ Entertainment/ Fun
    □ Meeting friends or visiting relatives
    □ Visit a physician"doctor", lawyer, Engineer,…etc.
    □ Going to work
    □ All the above mentioned

Section 4. (*Sociability*)

Below are four statements related to AS-Souq street's respondents that you may agree or disagree with. Using the 1-5 scale below. Where (**1**) ***Strongly Disagree***, (**2**) ***Slightly Disagree***, (**3**) ***Neutral***, (**4**) ***Slightly Agree***, and (**5**) ***Strongly Agree***. Answer each of the following (highlight the appropriate value/box) as they apply to yourself.

33. AS-Souq street's visit is preferable for you.

	1	2	3	4	5
Strongly Disagree	□	□	□	□	□Strongly Agree

34. Walking with relatives and friends is a desirable activity for you at the street.

	1	2	3	4	5
Strongly Disagree	□	□	□	□	□Strongly Agree

35. Knowing people by "face or name" is spontaneously happened on this street.

	1	2	3	4	5
Strongly Disagree	□	□	□	□	□Strongly Agree

36. Interaction with foreigners is done easily on the street.

	1	2	3	4	5
Strongly Disagree	□	□	□	□	□Strongly Agree

Thank you for your attention
Mai Eid Khalil Ahmed

APPENDIX-C

INTERVIEW QUESTIONS

Interview Questions

(AS-Souq Street)/ Saad Zaghlol St., Aswan, Egypt

Mai Eid Khalil Ahmed
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Also, Ph.D. Student at Yildiz Technical University,
Faculty of Architecture,
Department of Architecture,
Architectural Design Program, Istanbul, Turkey
e-mail: maieid63@yahoo.com

Date (Day/Time)_____

Section 1. (*Access & Linkages*)

1. Would you describe AS-Souq street as an urban public space?
2. Do you see this street as an important public space of consumption, shopping, and entertainment?
3. Would you consider this street as a major artery of Aswan city?

Section 2. (*Comfort & Image*)

4. Are there enough seats at AS-Souq street? If no, why?
5. Is the street qualified for all people of different ages and abilities? If No, why?
6. What are the reasons for dividing the street into six sectors by a number of gates?
7. Are there sidewalks or pedestrian paths in the different sections of the street? If no, why?

8. What is the reason in the allocation of most of the street sections for pedestrian only?

Section 3. (*Uses & Activities*)

9. What are the activities types that take place at AS-Souq street?
10. Are these activities open to everyone?
11. Are there any obstacles which prevent an "Accessibility Approach" to be existing at this street?
12. Is there any plan such as some laws and legislations enabling all people with different abilities and ages to use the street easily and conveniently?
13. Who is a responsible for putting into practice such these legislations?
14. What are your suggestions to enable inclusive street for all people?

Section 4. (*Sociability*)

15. Can residents help the government to achieve the goal? If yes? How?
16. Do architects and planners have a role beside the government and municipality for enabling an inclusive street for all people? If yes, How?

Thank you for your attention.
Mai Eid Khalil Ahmed