LEARNING CENTER FOR INDIGENOUS KNOWLEDGE AND CREATIVITY IN MALDIVES

Shifa Abdul Hannan

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor of Architecture

Department of Architecture Montfort del Rosario School of Architecture and Design ASSUMPTION UNIVERSITY 2013
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2013
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The aim of this thesis is to study about how architecture could help emphasize the importance of indigenous knowledge in a globally influenced community in Maldives. This paper goes in depth in understanding about the context, possible target users, why such an emphasis is needed and how architecture could tackle the issue of loss of indigenous knowledge in the community. The findings from the research indicate that there is a possibility of establishing a learning facility for indigenous knowledge which would not only cater for locals but can also relate with the tourists who come into the country. Moreover, the study also reveals how learning indigenous knowledge could relate to the globally influenced community and how architecture could balance between a modern society and knowledge from the past. The paper is concluded with the implementation of the findings from this research into architectural design process.
Acknowledgement

Alhamdulillah! (All praise and thanks to Allah). I believe it is my very first duty to thank Almighty Allah for showing me the light in pursuing education in this field of Architecture. I thank Allah for enlightening my heart with knowledge and giving me the strength and courage to face all the challenges I came across during my period of acquiring knowledge in this field. Without my faith in Allah and without his guidance, I would have been a boat sailing with no direction, heading nowhere in reaching my destination.

I would like to express my very special appreciation and sincere thanks to my thesis Advisor Professor Karan Paibullert for being a great mentor for me and also being a great inspiration for me always. I would like to thank him for the valuable and creative suggestions he put forward in order to help me develop my research and design. I also wish to acknowledge the enthusiasm and motivation he has shown throughout the entire time I worked with him, believing in me, which gave me more confidence in proceeding with my project.

I would also like to extend my gratitude to all the Professors I have worked with over the years. I believe the constructive criticism, ideas and suggestions given by all the professors helped me to widen my architectural thinking ability, helping me to build a better thesis research and design.

I wish to express my deeply heartfelt thank you to my parents for the love they show, the guidance and unconditional support they always give me. I thank them for their encouragement and motivation throughout my time of study and also thank them for simply believing in me. My heartfelt thank you is also extended to my brothers and sister for their care and emotional support throughout my study time.

Finally, I express my sincere thanks to all my friends who have been a great support for me emotionally as well as educationally.
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CHAPTER 1

THESIS INTRODUCTION

"Indigenous Knowledge is (...) the information base for a society, which facilitates communication and decision-making. Indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems"

(Flavier et al. 1995: 479)

1.1 Background of interest

Maldives is a country which is rich in its indigenous knowledge since the very beginning, as history indicates that it has been influenced by several countries around the world such as India, Sri Lanka and Middle East countries. These indigenous knowledge includes knowledge regarding arts, crafts, medicine, buildings techniques, cuisine, fishing, agriculture etc. Moreover, Maldives also have a rich knowledge base regarding the natural resources the country is blessed with, including the vast knowledge about marine biodiversity, flora and fauna etc. Since "Indigenous knowledge provides the basis for problem-solving strategies for local communities" and is a unique part of the culture and identity of Maldivians, this is an important database of knowledge which needs to be incorporated in everyday life of Maldivians. With the changing lifestyle of the people due to globalization, Maldivians have become distant from learning and making use of this vast database of knowledge which already exists in the country and the value of the knowledge is over taken by foreign knowledge and practices as mentioned in the official publication "General Overview of Dhivehi Language" by the National Center for Historical and Linguistic research/Maldives. It States "Many of the age-old customs and practices are being replaced by 'modern' ways of doing things and modern technology. Maldivian society has now entered the age of Information Technology (IT). It is now at a crossroad where the people have to maintain a delicate balance between their own unique cultural practices and a mass global culture". Moreover, the outdated system of learning in the country is not enough for the country to inspire and motivate the young generation to know and learn about the various


knowledge the country already have. Neither is there a solid playground for young
generation to explore and showcase their creativity and skills in using the indigenous
knowledge along with the modern international practices and knowledge. Although
"Sharing Indigenous Knowledge within and across communities can help enhance cross-
cultural understanding and promote the cultural dimension of development"3, the
country does not either offer many facilities to the large the number of tourists who
come into the country to make the full use of the knowledge existing in the country and
input their creativity and thoughts in exploring the knowledge. Neither does the country
enhance much social interactions between locals and tourists, since not much places are
established in the country which could act as community centers to build the local-
foreign relationships. Since the local young generation need to value and explore their
creativity in using the indigenous knowledge as understanding the indigenous
knowledge better could lead the country towards a more meaningful development,
while foreigners needs better access to the country's indigenous knowledge data base
and to get in touch with the locals and learn, there is potential in the country to build a
facility to allow local and foreign people to learn indigenous knowledge, explore
creativity and allow for social interactions.

1.2 Issue of interest

• How would the location of such a facility affect the efficiency of the facility usage
  and help integrate local and tourist life, in a context like Maldives?
  • Geographical formation of the country
  • Accessibility
  • Surrounding developments
  • Future developments
  • Users (locals and tourists)

• How would learning be promoted responding to the current time and users?
  • Learning methods and types of learners?
  • Changing trends of learning environments

• Learning methods and characteristics of the types of learners integrated with architectural space, programs, activities, technology etc.

• How could architecture be rooted in context/culture yet bridge between local and global?
  • Theory (Critical Regionalism)
  • Theory applied in context to achieve a suitable architectural language, identity and relation to context.

1.3 Objective of proposal

- Create an architecture which could expand the experience of learning, changing the perception of people towards learning, especially about indigenous knowledge.

- Create an architecture which could act as a community center or hub building social relations in terms of exchanging indigenous knowledge, information, skills and stories.

- Create an architecture which could result in the progression of creativity and problem solving techniques in this developed world, through the better understanding of indigenous knowledge.

- Create an architecture which could create an understanding between indigenous and foreign knowledge and allow for cross-cultural exchange.
1.4 Hypothesis of Proposal

- If a learning center is built with spaces and programs for an active learning process, more people will be motivated to learn the indigenous knowledge.

- If different types of learners are fully understood and catered for in a learning center, a user-friendly environment of learning of indigenous knowledge could be created.

- If indigenous knowledge learning is promoted through a learning center, where tourists could also take part in the activities held in the center along with the locals, more social relations could be created between locals and foreigners, which could in turn build cross-cultural understanding.

- If a learning center supports and promotes the skill of locals and their individualism in the modern world along with knowledge input from foreigners, it would result in more creativity.

1.5 Definitions of Terms

**Indigenous knowledge**—Knowledge that is unique to a given culture or society. It contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities. (Warren 1991)

**Globalization**—is the process of international integration arising from the interchange of world views, products, ideas, and other aspects of culture.

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4 http://www.worldbank.org/afr/ik/basic.htm

5 http://en.wikipedia.org/wiki/Globalization
1.6 Research Outline

1. Data Collection
   - Quantitative research methods
     - Existing statistical data will be used to verify useful information about the country, users, theories etc
     - Case studies will be used to analyze certain matters and observations.
   - Qualitative research methods
     - Methods such as interviews will be carried out to back up the research in more depth.

2. Data analytical
   - Data interpretation
     - Personal experiences and interpretations will also be used to understand certain issues.
   - Site analysis and interpretations

The study would focus on the following areas:

Research will be done to understand the current methods of learning in the country
Research will be done about the target users for the building including both locals and tourists
Research will be done about the location of the building and its relation to existing context and future developments
Research will be done to understand how the learning center could fit into the context and reflect its idea with respect to its context and the modern day world.
CHAPTER 2
PRIMARY STUDY

2.1 Data Collection

Since the core spark of the study is originated in the contextual background of the country, the first set of data is collected regarding the origin and settlements of the country, its geography and cultural aspects and indigenous knowledge of the country.

Introduction to Maldives (origin and settlements)

According to some archeologists such as Thor Heyerdahl in his book "The Maldives Mystery", he mentions that the Maldives was known as early as the 2000 BC and was a trading junction for several ancient maritime civilizations such as Egyptian, Mesopotamians and Indus Valley. Hence, the origin of the settlements is believed to be from different parts of the world such as Sri Lanka, India, Arabia and Africa, the very first settlers being Aryans.6 According to the historical data of the country, the very early settlers were sun worshipping people, followed by Hinduism and Buddhism, until the country embraced Islam in the 12th century.

Geography and population distribution of the country

The Maldives are a group of atolls, rings like coral islands, in the Indian Ocean just south west of India. The total land area is 300 sq Km7 and the population of the country is 328,536 (2012) inhabiting 192 of its 1,192 islands8. The 26 atolls of Maldives are oriented north-south direction.

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7 http://worldmap.org/maps/other/profiles/maldives/Maldives%20Profile.pdf
8 https://en.wikipedia.org/wiki/Maldives#cite_note-11
Figure 2.1: Location of Maldives on World Map
Source: http://www.maldives.org.my/Maldives_AboutTheMaldives_Location.php

Figure 2.2: Map of Maldives
Source: http://www.un.int/maldives/geog.htm
Table 2.1: POPULATION AND AREA DISTRIBUTION OF MALDIVES

<table>
<thead>
<tr>
<th>Atoll</th>
<th>Land Area</th>
<th>Population</th>
<th>Atoll Area (in hectares)</th>
<th>Reef Area (in hectares)</th>
<th>Inhabited islands only (in hectares)</th>
<th>Resorts (in hectares)</th>
<th>Industrial (in hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Thiladhunmathi (HA)</td>
<td>13,495</td>
<td>61,041</td>
<td>11,522</td>
<td>1,381</td>
<td>95</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td>South Thiladhunmathi (HDh)</td>
<td>16,237</td>
<td>92,519</td>
<td>13,596</td>
<td>1,807</td>
<td>166</td>
<td>307</td>
<td></td>
</tr>
<tr>
<td>North Nilandhe Atoll (FD)</td>
<td>4,967</td>
<td>75,697</td>
<td>10,699</td>
<td>176</td>
<td>47</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>South Nilandhe Atoll (GDh)</td>
<td>11,013</td>
<td>142,942</td>
<td>13,698</td>
<td>672</td>
<td>64</td>
<td>309</td>
<td></td>
</tr>
<tr>
<td>Fuvahmulah (Gn)</td>
<td>7,636</td>
<td>1,028</td>
<td>953</td>
<td>492</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Addu Atoll (S)</td>
<td>18,026</td>
<td>15,548</td>
<td>4,721</td>
<td>971</td>
<td>139</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Source: Department of National Planning- Statistical Yearbook of Maldives 2012
Cultural aspects and indigenous knowledge

Since the history of Maldives settlements indicates the difference in the origins of people, Maldives culture and traditions are brought in from these different origins. The culture and traditions of Maldives shows a colorful mixture of these different origins. Maldives indigenous knowledge could be divided into several categories such as arts & crafts, language & literature, music & dance, medicine, traditional sports, building techniques, cuisine, fishing, agriculture, rituals and social practices. Moreover, the indigenous knowledge also includes the knowledge regarding the natural resources of the country such as the marine life and flora and fauna.

Arts and Crafts
Maldivian Crafts work include wooden lacquer work, reed mat weaving, stone carvings, wood calligraphy, wooden carpentry, thatch weaving, basketry, coconut shell products such as toddy holders, jewelry making, coir rope making, fabric making such as elements of traditional dress and boat building.

Art works of Maldivians include Pyrography which is an art of using a heated tip to create burn marks which could be formed into patterns, drawings etc. Moreover, Maldivian early arts also includes paintings depicting the lifestyles of Maldivian, which is considered as traditional painting.

Language and Literature
Maldivians have an indo-aryan language unique to the people of Maldives known as Dhivehi, which is the official language of the country. The language is only used in Maldives itself along with the 10,000 people living in the neighbouring Minicoy island of Lakshadheep. Maldives have four major dialects of speaking and has its own system of writing.

Maldives language contains oral literature such as several forms of poetry known as ‘raivaru’, ‘bandhi’, ‘farihi’, ‘lhen’, ‘anbaa’, each recited in a certain matter and rules, rich in

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9 http://maldives.tourism-srilanka.com/arts-and-crafts.html
10 http://creativymaldives.org
traditional folk stories. Moreover, Maldivian written literature contains stories, essays and poetry.

Music & Dance
Maldives have several forms of traditional music and dance such as the commonly referred ‘Boduberu’, ‘Bandiyaa Jehun’, ‘Bolimalaaafath neshun’, ‘Dhandijehun’ ‘Fathigandu jehun’, ‘Gaa Odi Lava-folk music’, ‘Langiri’ and ‘Thaara jehun’. Each of these music and dance has its own characteristics and origins and is performed with a group of participants.¹¹

Traditional Sports and Games
There are several traditional sports and games played in Maldives over the past years. However, only few sports and games are recorded and still being played, while others have almost vanished. Some of the famous traditional sports games include ‘Bashi’ a women’s game played with a tennis racquet, ‘Baibala’ where one team tries to tag a member of another team inside a circle, ‘Waadhemin or tug of war’ and ‘Thinmugoali’ which is similar to baseball and has been played in the islands for more than 400 years.¹² There are also traditional board and card games which used to be famous among locals. These include Ovvalhugondi (Kalaha or Mankala), Carom, Chess, Cards etc.

Traditional Medicine
Traditional medicine of Maldives is influenced by Chinese and Unani practices of medicine. The medicine uses plant extracts and remedies for cure of all ailments such as bone problems, aches etc.

Building Techniques
Maldivian building techniques try to understand the materials available in the environment for building such as the coconut palms and the techniques to deal in adapting to the

¹¹ http://www.visitmaldives.info/maldives-music-a-dance.html

¹² Lonely planet – Maldives by Tom Master pg144
environment. Moreover, the space arrangements of buildings are based on the lifestyle and rituals of people.13

Cuisines
Maldivian food are mainly based on the most abundant food available to Maldivians from the early times such as coconuts, fish and starchy items. Maldivians prepare several unique dishes, desserts etc mainly using these ingredients.

Fishing
Since Maldives is surrounded by water, fishing has played an important role economically as well as in surviving with the natural resources. Maldivians have a traditional method of tuna fishing using pole and line rather than using nets and have several other traditional means and techniques for fishing different types of fish.

Marine Life, Flora and Fauna
Maldives have more territorial area of sea than the land. The coral reefs protect the islands and can be said as one of the most complex reef systems in the world. Moreover, a total of over 1000 species of fish have so far been catalogued from the Maldives from which over 300 of these were recorded from the Maldives for the first time. Seven species have been described as new to science, several more await description. Over 400 have been identified and catalogued and many are now held in the reference collection.14 Despite having nutrient-poor soil about 250 plant species thrive on the islands. The most common of course, the coconut palm that is well adapted to these conditions.15

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14 http://www.fao.org/docrep/x5627e/x5627e0a.htm
The second set of data is collected regarding the cultural institutions/facilities in the country and the present opportunities for cultural learning in the country, which could give a major insight into the importance of the study.

**Government Institutions**

The main government ministry related to the culture of Maldives is Ministry of Tourism, Arts and Culture of Maldives. National Center for Linguistic and Historical Research works under the ministry of Tourism of Maldives for preserving the cultural heritage of the country.

Ministry of Fisheries and Agriculture and the Marine Research Center working under the ministry deals with the natural resources of the country.\(^{16}\)

Maldives National Library offers the main collection of cultural knowledge recorded in the country.\(^ {17}\)

Maldives National University offers few courses based on culture and traditional knowledge learning such as language course and one traditional medicine learning course.\(^ {18}\)

The Maldives National Museum is the only museum in Maldives, which houses culturally and historically significant artifacts of the country.

**Private Facilities**

There is one community based cultural center, Dhangethi Cultural Center, in the central region of the country to preserve cultural heritage and to share some important aspects of Maldivian lifestyle with the visitor.\(^ {19}\)

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\(^{16}\) http://mrc.gov.mv

\(^{17}\) http://www.nationallibraryofmaldives.com/national.php

\(^{18}\) http://mnu.edu.mv

\(^{19}\) http://hello-maldives.com/ecotour.htm
One of the private facilities educating Maldivians in the cultural knowledge field of arts and crafts is Creative Arts and Crafts Training Center in Maldives, founded by a local well-known creative artist Adam Manik. They offer courses on crafts making.\footnote{http://creativemaldives.org/index.php/authors-artists/maizan-adam-maniku/}

- The third set of data is collected regarding the change in lifestyle of Maldivians over the years due to development of the country, which could prove why this study and such a project is important for Maldivians.

Based on history, it can be said that Maldivians lived a simple life in the earlier days and everything Maldivians did was based on their faith in religion and traditions. Maldivians lived in self-sufficient communities which developed their own way of living, working and learning. People adapted to their environments by exploring the natural resources around them such as the seas or palms etc. People usually worked just to survive such as farming or fishing to get food. Learning was either based on learning religious studies, learning basic arithmetics or learning language where people go to the most knowledgeable person in the community to learn. This simple life was changed with the exposure of the country to the surrounding world mainly due to tourism. Technology was introduced in the country and more opportunities became available for Maldivians in terms of working, living and learning. Living standards improved and foreign education systems were introduced. People started migrating from their small communities to areas which can provide the best opportunity for learning and working etc. Some people never returned back to their communities while some returned to their communities after experiencing the wider opportunities available for them outside their communities. The people who returned back to the communities brought in their new ways of living etc with them, changing some of the aspects of these communities. Hence, the original ways of the communities have started to disappear, taking away with it one part of the identity of the country and making the indigenous practices more vulnerable.
The fourth set of data is collected regarding the capital city of Maldives (Male') and a future city of Maldives (Hulhumale'), a major focus in the study based on local population and developments.

**Capital City Male'/Maldives**

Male' the capital city of Maldives could be counted as one of the smallest capital city in the world. However, almost 1/3rd of the country's population live in Male’, as most of the main administrative government offices, education and health facilities are present in this urban center located in the central region of the country. Male’ is the main destination for

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21 http://maldives.tourism-asia.net/maile-capital-of-maldives.html
temporary and permanent migration in the country. The census records of the country shows how the population of Male' have grown over the years.

Male' is divided into 6 sub divisions including two nearby islands. One island is a former tourist resort now developed as an inhabited local island while the other island is Hulhumale', a reclaimed land made for finding a solution for the overcrowding of Male' area and is being populated currently. Moreover, the nearby island of Hulhule', containing the main international airport of the country is considered as part of Male' city. Hulhule' is also one of the main transportation hubs in the country, which operates domestic planes to different parts of the country along with sea plane transport to resort developments.

Male' also contains several cultural spots of the country such as the historical grand Friday Mosque, Presidential Palace, National museum and park, fish market etc which is popular among the tourists who visit the country.
Hulhumale' is the most ambitious land reclamation and urban development projects under taken by the government of Maldives to date.\textsuperscript{22} Hulhumale' is developed to address the problem of population congestion in Male' and to improve the quality of urban life in the country center. Hulhumale' is about 5.3 km from Male' and is connected by land to Hulhule' containing the main international airport. Hulhumale' development comprises of two phases, the first phase comprising of 188 hectares of land reclamation. By 2020, this phase is going to be completed and about 60,000 people will work and live in this city area. The census records of 2006 by the Planning Ministry of Maldives shows that Hulhumale' had 412 households and 2866 people lived in the island, on which settlement began in 2004. However by 2010, it has reached approximately 12,000 and is rising currently.

"The planning and design of the project is carried out with a view to deliver Hulhumalé as a well planned development which effectively utilizes the land to maximize environmental and economic efficiency in terms of productivity, provision of employment, and advance the quality of life for the population", States the Hulhumale' Development Corporation. Hulhumale' also focuses on both local and foreign investments. Currently, foreign targeted guest houses and condominiums are coming up in Hulhumale' along with local targeted residences and facilities. Along with this, the first to be ever built shopping mall in Maldives is also located in Hulhumale'. Moreover, Hulhumale' is also becoming a local weekend hangout spot for even the people living in Male' and more social and youth activities are held in Hulhumale' such as racing, beach barbecuing, picnicking etc.

Figure 2.6: Map of Hulhule' and Hulhumale'

\textsuperscript{22} http://www.hdc.com.mv/development/introduction.php - official website of Hulhumale' development
A fifth set of data is collected regarding the main occupation of the country, Tourism, a major focus in the proposed study.

Tourism in Maldives began in 1972 with small group of Italians visiting the country. Attraction towards the tropical life, beaches and reef offering relaxation and marine life observance is attracting tourists from all over the world making the number of tourists visiting the country every year expected to reach a million in a near future. The tourism industry also contributes about 28% of the total GDP of the country.
Maldives tourism is based on one-island one resort concept, hence tourism exists as a different sector of the country from the local communities.

Maldives visitor survey report 2013\textsuperscript{23} shows that majority of the tourists visit Maldives due to the natural beauty of the country. This report also indicates that majority of the tourists visiting the country stay in resort islands and most of these tourists visit Maldives through tour agents. The tourists who visit the country are of different professions.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{motivators.png}
\caption{Motivators for choosing to visit Maldives}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{accommodation.png}
\caption{Type of accommodation selected by tourists}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{organization.png}
\caption{Mode of trip organization used by international visitors}
\end{figure}

\textsuperscript{23} Maldives Visitor Survey report 2013 February- Ministry of Tourism, Arts and Culture Maldives
Since, the main international airport is located in the central region of the county and also earlier tourism master plans focused on developing the central region of the country, more tourists resorts and hotels still operate around this area. Moreover, more transportation related to tourists such as seaplanes and safari routes pass through and anchor around this region. The figure below shows the concentration of tourism in the central region currently and its expansion to other regions planned to be achieved by 2020.

![Figure 2.13: International Visitors to the Maldives by occupational categories Source: Ministry of Tourism Arts and Culture, Maldives Visitor Survey 2013, February](image)

![Figure 2.14: 1984 = Development concept proposed in the ITMP, 2012 = current situation, 2020 = possible high growth scenario Source: Ministry of Tourism Arts and Culture, Fourth Tourism Master Plan 2013 - 2017](image)
Figure 2.15: Accumulated development of resorts and hotels (also showing underdeveloped leases)
Source: Ministry of Tourism Arts and Culture, Fourth Tourism Master Plan 2013-2017

Figure 2.16: Seaplane routes and distances
Source: Ministry of Tourism Arts and Culture, Fourth Tourism Master Plan 2013-2017
The Maldives tourism very much focuses on the natural beauty of the country aiming to portray the idealistic tropical relaxation holiday, by which Maldives is highly successful in competing with other such locations in the area. However, the 4th tourism master plan draft states that “One of the main trends identified in the UNWTO Tourism 2020 Vision report was a more demanding consumer increasingly seeking direct access to the culture and nature of the destinations they visit.”... “In this regard, destinations like India, Sri Lanka and Thailand are well placed to cater for this type of demand; and the present Maldives' product offering is not competitive.” Hence, this new master plan includes “Maldives...the human side of life for tourists seeking to combine their beach resort holiday with interaction with the lifestyles of local people”, as one of their sub-positioning statements.

- A sixth set of data is collected regarding the learning nature of humans and the changing environment of learning, an important data needed for the study

Regardless of the type of knowledge you learn, the learning nature of humans is important information to look into if people need to be motivated to learn.

Methods of learning
First of all, it is important to know about the two different processes of learning which are; active and passive learning.
Passive learning is a learning approach where learners usually learn by listening to lectures given by a person and involves less with experiencing or analyzing the knowledge given to them. Meanwhile, active learning involves the learners mentally and physically in learning the content and engages all the senses of learners in the learning process. “Research shows that active learning is much better recalled, enjoyed and understood. Active methods require us to ‘make our own meaning’.”

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24 http://geoffpetty.com/for-teachers/active-learning
What I hear, I forget.
What I hear and see, I remember a little.
What I hear, see, and ask questions about or discuss with
Someone else, I begin to understand.
What I hear, see, discuss, and do, I acquire knowledge and skill.
What I teach to another, I master. (Silberman, 1996, p. 1)

There are several techniques which could be used for active learning such as discussions, role-playing, debates, game-based learning, problem solving using real data, case studies, group projects, demonstrations followed by discussion, field trips, etc.

Types of learners
Since the nature of each learner will differ, it is important to look into the types of learners there are. Mainly there are 4 primary types of learners. Visual learners, Auditory learners, Read-Write learners, and Kinesthetic learners. Visual learners learn mostly by seeing and visualizing something while Auditory learners prefer to learn by listening to something and verbalizing. Moreover, Read-Write learners enjoy to learn by reading and writing in any form while Kinesthetic learners use their senses to engage in learning and use a more hands-on approach or experiential approach for learning.

Changing trends in learning environments
"A learning space should be able to motivate learners and promote learning as an activity, support collaborative as well as formal practice, provide a personalized and inclusive environment, and be flexible in the face of changing needs."

The 21st century of learning consists of several kinds of activities and behaviors associated with it hence learning spaces are multi-functional including social spaces, access to information technology, work area for different purposes, comfortable seating areas, etc.

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26 http://lyceumbooks.com/pdf/HowToTeachEffectively_TypesofLearners.pdf
27 http://www.jisc.ac.uk/uploaded_documents/JISClearningspaces.pdf: Designing Spaces for effective learning/ a guide to 21st century learning space design
Strategies are developed to cater for the needs of different types of learners and different modes of learning. Mostly, this strategy involves keeping the modes of learning separately to let it not conflict with each other. However, the learning environment as a whole can provide learning spaces and activities for every mode of learning.

"You can't be sure how these spaces will be used. You are just creating the opportunities for things to happen."

Tom Finnigan, Director of Learner Support, Learning Services, Glasgow Caledonian University

- A seventh set of data is collected regarding how architecture could balance between culture and globalization, a useful source of information needed to define the direction of architecture in this project.

Each country has its own characteristics of architecture which are based on indigenous knowledge, traditions and beliefs. Hence, Maldives also has its own characteristics in architecture by the different types of buildings for different uses, spatial qualities, sustainable techniques and materials used. In this globalized world, however these local traditions of building are over taken by the universal cultures, which unable the country to define its direction of architecture and its sense of place.

The theory of Critical Regionalism explains how a place could achieve its own distinctive architectural identity in this globalized world as Critical Regionalism is an approach to architecture where sense of place and meaning is given to the modern architecture which lack meaning and sense of place. The theory as explained by Kenneth Frampton in his essay "Towards a Critical Regionalism- Six Points for an Architectural Resistance" states that critical regionalism should adopt the modern architecture in a critical way for its universal progressive qualities yet should value the peculiarities of a specific context. He also states that the criticality of doing so could get the inspiration from a range of things such as local light, peculiarity of structural modes or from the topography of a given site etc. He also believes that Critical Regionalism should not only focus on bringing back a lost vernacular
alone which is not a critical approach. Furthermore, he also states that Critical Regionalism allows more relation with the nature than the abstract and formal traditions of modern-avant garde architecture. Critical regionalism also deals with more tectonics in architecture rather than scenographics. The tectonics is referred to not only make the required construction but displaying the construction as art and giving its own sense of expression. In addition, critical regionalism also deals with the tactile nature rather than the visuals which means that the environment and built form is not only perceived through seeing but is perceived through all the human senses.

2.2 Data Analysis

The collected data indicates how the indigenous knowledge and practices are related to every aspect of what makes Maldivians who they are. The various fields of indigenous knowledge indicates that there are existing pure knowledge in the community itself on which the survival of the previous generations were based on. These knowledge prove to be the foundation of every field of intelligence and practice in the country such as creativity, social connections, communication, living etc. Hence, the collected data shows the areas of foundation already provided for the current generation from which they should learn and precede into the future, keeping the existing knowledge intact as the main source of knowledge.

From the data collected above, the importance of building a learning facility for indigenous knowledge is clear since the data indicates how less opportunities the country provide for people to learn the knowledge existing in the country. Most of the culture, heritage and natural resources related facilities are just government administrative facilities which do not provide or open up much opportunities for locals or foreigners to learn about the knowledge the country has. The national library and museum, even though they house artifacts and cultural knowledge, the facilities do not provide a well directed learning environment for the locals neither the foreigners. The Maldives National University also provides the very basic courses for only the fields of language and traditional medicine. The country also have few private facilities which deals with culture related knowledge. The Cultural center in the country targets tourists to experience a part of Maldivian lifestyle and does not offer much to the locals itself. Furthermore, the Creative Arts and Crafts Center in
Maldives focuses only the arts and crafts area of the indigenous knowledge. Hence, the opportunity of learning other areas of indigenous knowledge could be said as almost not existing. In addition, these data also shows that there are few or no facilities in the country to fully emphasize on the learning of indigenous knowledge and allow people to experiment with the indigenous knowledge, to be applied in modern day innovation.

Target users for the project can be determined by the accumulated data. As tourism contributes almost 1/3rd of the GDP of the country and the numbers of tourists visiting the country are increasing every year, tourists could be one main target group to focus in the project, even in terms of the success of the project economically. Other reason for targeting the tourists are that as indicated in the data that the tourists looking for more than a beach holiday and looking for experiencing the culture of the place they visit are increasing. This shows the interest they may show in the proposed project. Focusing only on tourists will not work if the people who are there to show their culture to others are not there anymore in the future since the cultural practices are diminishing. Hence, locals have to be the main target group to focus on in order to widen the opportunities for the locals to hold onto what they are losing and explore it while also helping locals to thrive economically in the future.

Based on the issue of interest and hypothesis proposed, the appropriate location of a facility is one crucial factor for the success of the facility, especially in a country like Maldives who have a dispersed geographical formation as shown in the data collected. Moreover, according to the hypothesis proposed, the facility should bring together a majority of local people together with the tourists who visit the country. As the collected data shows that almost 1/3rd of the country's population lives in the capital city Male', with more to come with the development of the new city, this could be a good location for establishing a learning facility which could let more locals use the facility. Moreover, since Male' is also the main place for temporary and permanent migration in the country, more people will access the area and pass through the area as it is like a home for everyone in the country. Likewise, more people living a city life also means that people have a busier life and less time to travel around the country and experience and acquire local knowledge from different parts of the country. Urban life also means that most learning and education will also take place in this area even though learning does not relate with indigenous practices. Moreover, based on the tourist visitation, the central area of the country seems to be the hub for the
distribution of tourists to other parts of the country and also most number of tourist resorts
and guest houses are located around this central region of the country. Furthermore, there
are also current famous tourist cultural spots located in Male’ where tourists prefer to visit
and which tour agents promote. Hence, proposing a learning center in this central region of
the country could be more accessible by the tourists who visit the country as well.

The data collected also indicates that tourism and local life are two separate entities
existing in the country. As data indicates that Maldives tourism is based on one island one
resort concept, more number of tourists stay in these resorts which are totally secluded
from the islands where locals live. Moreover, since the current focus of Maldives is on sun­
sand-sea tourism promotion, few activities are available for tourists to enjoy with the
experiencing and getting to know locals and their lives. The data also indicates the new
approach the government has included in their fourth tourism master plan to address this
issue. Hence, this area of tourism focus could be expected to thrive in the future, which is a
strong point to support a project relating to this field.

The data collected regarding the types of users and the changing trends of learning in the
modern world indicates that more innovative means of learning can also be used in learning
indigenous knowledge. Since, changing the people’s perception towards learning
indigenous knowledge and letting locals explore their creativity in learning indigenous
knowledge in the modern world are some objectives of the project, fully understanding the
nature of how people learn can help achieve these objectives. The data collected indicates
that there are several types of learners and in order to attract attention from these different
types of learners, different modes of learning should be provided. This means that even
though it is indigenous knowledge or any other knowledge that is being learnt, it should
interest these different types of learners and in order to fit with the modern world, even
modern technologies need to be used to learn ancient or cultural knowledge. Using modern
means also means giving more opportunities for creative and interactive learning. This give
an insight to the types of programs which could be offered in this learning center and the
different means of media and tools which could be explored.

The data collected regarding the theory of critical regionalism indicates how a common
ground could be found regarding the issues of global and local, through architecture. This
theory could be used to relate the building with the context and create a more meaningful architecture which could be accepted as part of the society. This theory would also help to explore the local means of construction and techniques in adaption to the surrounding.

2.3 Data Evaluation

The collected data proves the importance of the proposed facility as there are lack of facilities to provide the indigenous knowledge to the people while the modernization is taking over the indigenous practices in the country. The collected data shows the vast database of indigenous knowledge existing in the country and how it is effected even though it represents the identity of the people, which is the reason why indigenous knowledge needs to be the focus of the proposed facility. Furthermore, data collection gives an in-depth understanding of the geography and context which shows how the local and tourist life is separated in the country. This gives an important reason why the main target users need to be both locals and tourists as the project could enhance social interactions between locals and foreigners, letting them understand the cultures. Furthermore, tourists seeking more cultural experience is also a major reason for targeting tourists in this project. The data collected regarding the learning methods and types of learners will help achieve the objectives of the project which is to motivate more locals to learn indigenous knowledge along with developing their creativity, since the architecture could relate more with the preferences of learners. It would also help define the architectural space, programs and activities which could be created in relation to users, space and knowledge. In addition, how architecture could fit into the context and balance between global and local could be achieved through the theoretical data of critical regionalism which would help bring in more meaning to the architecture.

2.4 Synthesis

All pieces of these data could be combined together to answer the issues, objectives and hypothesis stated above. A suitable location of the facility to bring both locals and foreigners together would in turn allow both locals and foreigners to use the facility, building social
relations between both locals and foreigners and allowing for more cultural understanding and exchange of knowledge. This would also result in exchange of foreign ideas and local ideas resulting in more creativity and innovation. Understanding the learning nature of people could help define more user-friendly programs and spaces which would in turn motivate people to learn indigenous knowledge and will help them to better understand the indigenous knowledge through their own way of learning. Moreover, it would also lead to individual skill development and will promote creativity. Furthermore, applying the 21st century learning methods and space in architecture would help achieve one of the objectives of this project which is to change people's perception towards learning, especially about indigenous knowledge. Application of the theory of critical regionalism would help the architecture to relate with the context as well will help to achieve a balance between global and local issues existing in the context in more profound ways. This includes giving the architecture a sense of place and also letting the architecture display the knowledge it could acquire from the geography and local context.

2.5 Abstract
The major conserved principles in this research paper are globalization, indigenous knowledge and architecture. A more quantitative research approach was used to understand the context, indigenous knowledge in the community and what architecture could do to tackle the issue of loss of indigenous knowledge in the modern society. The findings from data collection indicates that learning facilities for these knowledge are less in the country and also no facilities are available for the tourists who come into the country looking for cultural experience. The data collected regarding the learning nature of people gives useful insight into how architecture could relate with users, programs and indigenous knowledge. Moreover, data collected regarding the theory of critical regionalism could direct the architecture to have a more meaningful approach in relation to the context through its architectural language.
2.6 Thesis Statement

By looking at the collected data, I argue that a learning center for indigenous knowledge and creativity is needed in Maldives, as such a facility would emphasize and encourage Maldivians to hold onto their cultural practices and use their creativity in developing these cultural practices in the process of globalization taking place and also be a center for cultural knowledge exchange with the tourists who come into the country, looking for a more cultural/local involvement.
CHAPTER 3

CONTEXTUAL PROPOSITION

3.1 District Selection

According to the data collected, one of the most appropriate region to locate the proposed project would be the central region of the country. As discussed above, the central region of the country contains 1/3rd of the local population in the country and it is also where most tourist resorts and attractions are concentrated. Moreover, the central region of the country contains the capital city of the country and also comprises of major development projects undertaken by the government of Maldives and also future development projects. Since the capital city of the country contains the major administrative facilities of the country and better infrastructure, more locals also migrate to this area temporarily or permanently. Furthermore, since the main international airport in this region, more tourists arrive at this airport, where they get transferred to their respective resorts and hotels. This means that the majority of the target groups for the proposed project can easily access the project if located in this region.

As Maldives is based on a very unique geography, selecting a district is approached in a different way compared to the actual meaning of a district. In Maldives, each island contains several districts, which in another meaning is also called wards. Since the islands are small and variety of choosing a location to locate the project is limited, I choose three different islands in the central region of the country as similar meaning with district. The islands are Male’ (the city center), Hulhumale’ (the airport containing island), and Hulhumale’ (the recent reclaimed island). In selecting the district, several criteria were formed which could relate with hypothesis, objectives and issues outlined in the previous chapters. Below is a table which could compare the districts in terms of the criteria formulated. The points given to each district based on the criteria, was added up to find the most suitable district to locate the project.
<table>
<thead>
<tr>
<th>Category</th>
<th>Male</th>
<th>Hulhumale'</th>
<th>Hulhule'</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Local Population</strong></td>
<td>103,693</td>
<td>41,201 youth</td>
<td>33,434</td>
</tr>
<tr>
<td><strong>Tourist Arrivals/Stay</strong></td>
<td>Number of registered hotels = 13</td>
<td>Number of registered guest nights = 1,000,000</td>
<td>Number of tourists coming into the country = 12,000 (expected to be 60,000 in 2020)</td>
</tr>
<tr>
<td><strong>Cultural Attractions/Historical Sites</strong></td>
<td>17th century Grand Friday Mosque, Historical Museum, Fish market, Museum, Arts Gallery, Bradford of national heroes, former presidential palace.</td>
<td>No cultural attractions</td>
<td>No cultural attractions</td>
</tr>
<tr>
<td><strong>Transportation/Access</strong></td>
<td>Ferry boat service within region, harbour for boats &amp; ferry to south &amp; north parts of country, ferry boat service to Hulhule and Hulhumale.</td>
<td>International and domestic flight landing, seaplanes to central and north region, speedboats for resort transfer.</td>
<td>Linkage to Hulhule' through public transport course-way, ferry boat service to Male'</td>
</tr>
<tr>
<td><strong>Land Planning/Urban Design</strong></td>
<td>No prior land use plan, no concept for whole development, administrative center of the country, landuses include residential, institutional, commercial, etc.</td>
<td>Airport as part of Male' Hotel and commercial park</td>
<td>Prior land use plan, Concept for whole development, Future an administrative center, landuse include residential, commercial, institutional etc.</td>
</tr>
<tr>
<td><strong>Environment/Pollution &amp; Natural Surroundings</strong></td>
<td>Heavy traffic both land &amp; sea, Dump yard, visual pollution due to congestion and High rise, less green.</td>
<td>Only airport vehicles and plane, no dump yard, no visual pollution, more green.</td>
<td>No traffic problems. No dump yard, no visual pollution, more green</td>
</tr>
<tr>
<td><strong>Local Activities/Liveliness</strong></td>
<td>Center of all activities in the country, center of youth activities, business center of the country, education center of the country.</td>
<td>No local activities</td>
<td>Local weekend activities, new emerging center for activities</td>
</tr>
</tbody>
</table>
Based on the points given, Male', the city center was chosen as the most suitable district to locate the project. Male' leads compared to other districts in terms of the local population, the cultural value of the district, the transportation and access as well as the current local activities and gatherings happening in the island. Male' contains almost 1/3rd of the country's population among which 43,210 are youth. Since Male' is an old town, Male' contains several historical places such as the 17th century Grand Friday mosque and minaret as well as historical tombs of national heroes and also former Presidential Palace etc. Male' is also well connected to all parts of the country and contains ferries and speedboats travelling to every part of the country. Furthermore, Male' is also the center for all major local activities such as social, political and other such gatherings. It is also the administrative center of the country also being the business and education center of the country. Based on these factors, Male' is an appropriate location to locate the facility as both tourists and locals could access the facility and also it could relate with the other local events happening etc.

### 3.2 Site Selection

In order to select a site, three sites were chosen in the selected district, which have some similar characteristics to be compared. Since Male' is the city center and it already have the problem of overcrowding and lack of land for residence, I chose three lands which are currently vacant and in the process of further development. These land are specified for recreational and social uses by the government of Maldives. Like the process of selecting a district, some criteria were formed based on hypothesis, objectives and issues which could lead to the selection of the best site to locate the project. The table below shows the sites compared in terms of the criteria formulated.
Evening sun (Very hot in the evening)
Less threat of flooding, High salt concentration
Potential threat of flooding (Close to sea), High salt concentration, break water area
Concerts, children events and political events around
Few social events
When adding up the points given to each site in relation with each criteria, Site B was chosen as the most suitable site for the project. Site B has good accessibility since it is connected to two major roads, the outer ring road and a road running east-west. The outer ring road runs throughout the circumference of the island and the road running east-west covers the entire east-west direction of the island. The site is also located very close to public bus transport system and is not very far from ferry terminals. Moreover, the site surrounding has facilities related to both local and foreigners such as park, surfing point, convention center, residences etc. Furthermore, the site has good view towards the ocean and a park adjacent to the site. In addition, the site is also suitable for evening activities according to the direction of the sun and also currently, the site surrounding is a known location for social, physical, political and youth events held in the island. Based on these factors, the site has the potential for providing a good environment for learning and could allow for both indoor and outdoor programs to happen. Moreover, the site also has the potential of drawing in both local and foreigners based on the current activities happening around the area. Below is some basic information regarding the site.
MAXIMUM BUILDING HEIGHT = 30 METERS

SETBACK FROM ROADS OF WIDTH LESS THAN 6M = 2M

CURRENT LAND USE: SOCIAL & RECREATION PURPOSE (currently under the process of government bidding to find proposals for area development) - reference to City Council land use document)
The design of this project would try to understand different types of learners in order to provide appropriate and user-friendly programs and space for learning cultural knowledge in the 21st century. Understanding these different types of learners could help define the programs, activities and spatial qualities needed to motivate learners to learn the cultural knowledge. Moreover, it could also give the direction to how technology could be used in accordance with the learners. In addition, the design of this project would also try to understand how the design could relate with the context and how it could integrate modern and local issues. Hence, the design would try to understand how to make contextual connections and provide programs, activities and spaces to draw in the global influenced local community. The design would also try to understand how to relate with local geography and weather in order to provide geographically suitable spaces which could also give importance to the environmental aspects. Furthermore, the design would try to
understand local building techniques and aesthetics which could help the project to establish a certain local identity in this modernized world. Apart from this, the design of this project would also try to understand how to integrate local and tourist life in the country. This could help to define what kinds of programs could help to do so and what kind of spaces would be needed to interest both of these target user groups.

4.2 Users Programming

The following diagram summarizes how the users are divided in terms of learning and what kind of programs are suitable for each type of users.

The users are divided into locals and tourists/foreigners. Each of these users are further divided into users who would go into in-depth learning and learning through a normal experience. For locals who would want to go into in-depth learning, programs such as workshops, studio classrooms, meeting rooms, art studio and library would be provided in this project. For locals who would learn through a normal cultural experience, amphitheatre, games room, auditorium, and exhibitions would be provided for surface level learning. For foreigners who would want to go into in-depth learning, artist-in-residence...
program would be provided for them to work with the locals for a certain period of time. This would provide them a different environment to work in and would allow them to develop their own skills as well as share their knowledge with the locals. For tourists who opt for a normal local experience, programs such as exhibitions, amphitheater, games room, restaurants and retail would be provided. These users can come and understand about the locals through the exhibitions and participating in cultural performances. They could also get in touch with locals through restaurants which would act as a social point and also could buy authentic local products from retail shops, meeting with the local skill men.

4.3 Organization Structure

The project is proposed as a government project managed by the department of National Center for Linguistic and Historic Research, working under the Ministry of Tourism, Arts and Culture. This department currently deals with maintaining and researching about the cultural heritage of the country. Proposing the project as a government project would widen the opportunities for the facility to relate with other organizations in the country and also would help to fully relate with locals and tourists. The facility would have three main departments which are Exhibition, Events and Activity Department, Knowledge department and Operations and Administration Department. The Exhibition, Events and Activity Department would be organizing and handling all the work related to the exhibitions and events held from this facility. This also includes collaborating with other culture related organizations to organize various exhibitions and events. The Knowledge department would be further divided into three sectors which are Resource Center, Training and Learning and Artist-in-Residence Program. Resource Center will deal with the library and Training and Learning Sector would handle all the classes, workshops and lectures held from the facility while Artist-in-Residence sector would coordinate the Artist-in-residence program which would bring in foreigners who would like to work with the facility.
The Operations and Administration Department is further divided into Administration, Budget and Finance, Human Resources, Marketing and Public Relations and IT and Facility Management Sectors. This Department mainly deals with the staff working in this facility and also deals with looking after the facility. Moreover, this department would also maintain all the records of the users who take part in the classes, workshops etc held in the facility.

4.4 Activities/Spaces

The activities which would help to define the spaces are summarized in the tables provided under the topic 4.5 in this chapter.

In order to have a better understanding of the functions in terms of primary and secondary functions, the following diagram summarizes these functional relationships. The diagram summarizes the percentage of the area of both primary as well as secondary functions. Even though secondary functions have a greater overall percentage, these functions will play an integral part in the functioning of the primary functions and its relation to community.
### 4.5 Space Summary

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>TARGET USER</th>
<th>PROPOSED FUNCTION</th>
<th>REFERENCE (GRAPHIC STANDARD)</th>
<th>REFERENCE (DATA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrance Foyer/Hall</td>
<td>All Users</td>
<td>Receiving people into the facility, reception and information counter, waiting areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amphitheatre/plaza</td>
<td>Local youth &amp; tourists</td>
<td>Cultural performances, traditional festival celebrations, music and dance events, music &amp; dance learning &amp; rehearsal space, outdoor exhibition space, community plaza space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music &amp; dance practice and rehearsal studio</td>
<td>Local youth</td>
<td>Indoor practice and teaching area for cultural music, dance, art, poetry, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshop</td>
<td>Local Youth</td>
<td>Heavy duty teaching area for textiles &amp; crafts making (lacquer work, woodwork, weaving, wood calligraphy, etc.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Library</td>
<td>Local Youth, Tourists and others</td>
<td>Collection of traditional knowledge related to various fields &amp; library - Can create interest among youth for cultural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROGRAM</td>
<td>REFERENCE (CASE STUDY)</td>
<td>PROPOSED USER NO.</td>
<td>PROPOSED APPROXIMATE AREA</td>
<td>PROPOSED UNIT NO.</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------</td>
<td>-------------------</td>
<td>---------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Entrance Foyer/Hall</td>
<td>Phuket Cultural Center</td>
<td>250 people in the hall at a time</td>
<td>Approx. = 300 sqm (1.5 sqm per person)</td>
<td>1</td>
</tr>
<tr>
<td>Amphitheater/plaza</td>
<td>Phuket Cultural Center</td>
<td>1000 people sitting or standing</td>
<td>seating to standing ratio of accommodation = 1:2</td>
<td>1</td>
</tr>
<tr>
<td>Music &amp; dance practice and rehearsal studio</td>
<td>Phuket Cultural Center</td>
<td>50 users at a time</td>
<td>Based on case study, 1 room which can accommodate maximum 75 = 35&quot; x 50&quot; (10.5 x 1.5 meters) so for 50 users, area = 105 sqm</td>
<td>1</td>
</tr>
<tr>
<td>Workshop</td>
<td>Phuket Cultural Center</td>
<td>15 students per workshop</td>
<td>10 students x 9.206 sqm per bench - area = 92.9 sqm</td>
<td>2</td>
</tr>
<tr>
<td>Library</td>
<td>Phuket Cultural Center</td>
<td>1/3 youth population = 14400</td>
<td>use case study 47 sqm/1000 population = 658 sqm</td>
<td>1</td>
</tr>
<tr>
<td>ROOM</td>
<td>TARGET USER</td>
<td>FUNCTION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail design studio</td>
<td>Alumni</td>
<td>For alumni and professional design knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting rooms</td>
<td>Alumni</td>
<td>For alumni and professional gatherings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian craft hall</td>
<td>Local</td>
<td>For local community and workshops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art studio</td>
<td>Youth</td>
<td>For youth and creative activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Studio</td>
<td>Youth</td>
<td>For youth and creative activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition</td>
<td>Local</td>
<td>For local community and exhibitions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REFERENCE (GRAPHIC STANDARD)**

**REFERENCE (DATA)**
<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>REFERENCE (CASE STUDY)</th>
<th>PROPOSED USER NO.</th>
<th>PROPOSED APPROXIMATE AREA</th>
<th>PROPOSED UNIT NO.</th>
<th>TYPE (PVT/PUBLIC)</th>
<th>SPECIFICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhibition</td>
<td>TUGA</td>
<td></td>
<td>1000 sqm exhibition space</td>
<td>1</td>
<td>Public</td>
<td>Temporary and permanent exhibition area Welcoming all users</td>
</tr>
<tr>
<td>Studio Class-rooms</td>
<td>Carnegie Mellon University, School of Art</td>
<td>10 students per room</td>
<td>size of class per 20 people = 125 sqm 5 classes = 625 sqm</td>
<td>5</td>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Art Studio</td>
<td></td>
<td></td>
<td>from case study, area per person taken as 350 sqft (33.5 sqm, including storage etc.) 10 artists = 325 sqm</td>
<td>1</td>
<td>Private</td>
<td>Private working areas and storage</td>
</tr>
<tr>
<td>Artist-in-residence studio</td>
<td></td>
<td>10 artists per room</td>
<td>from case study, area per person taken as 350 sqft (33.5 sqm, including storage etc.) 10 artists = 325 sqm</td>
<td>1</td>
<td>Private</td>
<td>Private working areas and storage</td>
</tr>
<tr>
<td>Auditorium / conference hall</td>
<td></td>
<td>250 people</td>
<td>Area for seating = 125 sqm Total area = approximately 193 sqm</td>
<td>1</td>
<td>Private</td>
<td>Connected with rehearsal studio provide control room</td>
</tr>
<tr>
<td>Meeting rooms</td>
<td></td>
<td></td>
<td>Area per person for L-shape meeting room = 3.25 sqm area for 10 people = 32.5 sqm 4 rooms = 130 sqm</td>
<td>4</td>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Retail shops</td>
<td></td>
<td></td>
<td>400 sqm retail space</td>
<td>N/A</td>
<td>Public</td>
<td>Provide only specified retail shops Easy access to everyone</td>
</tr>
<tr>
<td>PROGRAM</td>
<td>TARGET USER</td>
<td>PROPOSED FUNCTION</td>
<td>REFERENCE (GRAPHIC STANDARD)</td>
<td>REFERENCE (DATA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
<td>------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurants &amp; Cafes</td>
<td>All users</td>
<td>Informal social knowledge exchange space. Create informal relationships between locals and foreigners as well as strengthen the knowledge community.</td>
<td><img src="image1.png" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Games room</td>
<td>Local Youth and foreigners</td>
<td>Create an environment that promotes social interaction and fosters a sense of community.</td>
<td><img src="image2.png" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations &amp; Admin.</td>
<td>Director, Managers, officers, technicians etc.</td>
<td>Monitoring the operation and management of the facility, ensuring compliance with safety and building regulations.</td>
<td><img src="image3.png" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge Management</td>
<td>Director, Managers, officers, technicians etc.</td>
<td>Cataloging and managing the knowledge base and ensuring accessibility and relevance.</td>
<td><img src="image4.png" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition, Events &amp; Activity</td>
<td>Director, Managers, officers, technicians etc.</td>
<td>Organizing activities such as cultural events, exhibitions, and workshops to promote community involvement.</td>
<td><img src="image5.png" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking Area</td>
<td>All visitors</td>
<td>Ensure the provision of adequate parking facilities for visitors and staff.</td>
<td><img src="image6.png" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on "Local planning Regulations" by the Ministry of Housing and Urban Development (July 2008), parking should be provided for buildings other than residential if the building height does not exceed 30 meters, parking should be 8% of the total area of the whole facility.
<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>REFERENCE (CASE STUDY)</th>
<th>PROPOSED USER NO.</th>
<th>PROPOSED APPROXIMATE AREA</th>
<th>PROPOSED UNIT NO.</th>
<th>TYPE (PVT/PUBLIC)</th>
<th>SPECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurants &amp; Cater's</td>
<td></td>
<td>150 users/week</td>
<td>Dining area required for a normal restaurant (1.7 x 150 x 225 = 52125 sqm)</td>
<td>N/A</td>
<td>Public</td>
<td>Make use of best view, Easy access to everyone, More importance on traditional food</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.7 x 10 x 1.5 = 25 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>kitchen area = 0.5 x 150 = 75 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>80% of both dining and kitchen area for supplements (storage, personnel area etc) = 2060 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total restaurant area = 225 + 75 + 260 = 360 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Games room</td>
<td></td>
<td>20 users per time</td>
<td>1.5 sqm per person/50 sqm</td>
<td></td>
<td>Public</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30% circulation = 6 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total = 36 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations &amp; Administration department</td>
<td></td>
<td>1 Director</td>
<td>1 Director = 13.4 sqm</td>
<td></td>
<td>Private</td>
<td>Private zone (authorised personnel) provide other staff support areas including restrooms, tea room etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Department Manager</td>
<td>4 Department Manager = 9.3 x 4 = 37.2 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 supervisors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 employees</td>
<td>20 employees = 9.3 x 20 = 186 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 admin staff</td>
<td>11 admin staff = 9.3 x 11 = 102 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total = 186.4 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15% for circulation = 16.6 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>non people space (machine rooms, storage etc) = 30% = 17% for circulation = 45 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total non people space = 57 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grand Total = 183.65 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge management department</td>
<td></td>
<td>1 Director</td>
<td>1 Director = 13.4 sqm</td>
<td></td>
<td>Private</td>
<td>Private zone (authorised personnel)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Manager</td>
<td>1 Manager = 9.3 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Supervisor</td>
<td>1 Supervisor = 9.3 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Coordinators</td>
<td>2 Coordinators = 9.3 x 2 = 18.6 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 support staff</td>
<td>7 support staff = 9.3 x 7 = 65.1 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 personnel</td>
<td>10 personnel = 9.3 x 10 = 93 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 technical staff</td>
<td>3 technical staff = 9.3 x 3 = 27.9 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total = 261.6 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15% for circulation = 39.2 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>non people space (machine rooms, storage etc) = 30% = 17% for circulation = 45 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total non people space = 57 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grand Total = 180.87 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhibition, Events &amp; Activity Department</td>
<td></td>
<td>1 Director</td>
<td>1 Director = 13.4 sqm</td>
<td></td>
<td>Private</td>
<td>Private zone (authorised personnel) provide other staff support areas including restrooms, tea room etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Managers</td>
<td>2 Managers = 9.3 x 2 = 18.6 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 Coordinator</td>
<td>1 Coordinator = 9.3 x 1 = 9.3 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 staff (including office)</td>
<td>5 staff (including office) = 9.3 x 5 = 46.5 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total = 48 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15% for circulation = 7.2 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>non people space (machine rooms, storage etc) = 30% = 17% for circulation = 45 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total non people space = 57 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grand Total = 180.57 sqm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking Area</td>
<td></td>
<td></td>
<td>8% of 17,910 sqm = 1,433 sqm</td>
<td></td>
<td>Public</td>
<td>More parking for motorcycles, Parking for cars</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ESTIMATED TOTAL AREA OF FACILITY (EXCLUDING PARKING):** 12,910 SQM

**GRAND TOTAL = 13,943 SQM**
The table compiled in the previous pages shows the proposed programs for the project along with proposed functions of the programs in relation to users. The table also shows the process of how the areas of the spaces were calculated. Mentioned below is a summary of each program and its proposed area in the project.

<table>
<thead>
<tr>
<th>Program</th>
<th>Proposed Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrance Hall</td>
<td>approx. 300 sqm</td>
</tr>
<tr>
<td>Amphitheatre/Plaza</td>
<td>approx. 5400 sqm</td>
</tr>
<tr>
<td>Music &amp; Dance Practice &amp; rehearsal room</td>
<td>approx. 105 sqm</td>
</tr>
<tr>
<td>Workshop(woodshop)</td>
<td>approx. 1600 sqm</td>
</tr>
<tr>
<td>Library</td>
<td>approx. 790 sqm</td>
</tr>
<tr>
<td>Exhibition</td>
<td>approx. 1000 sqm</td>
</tr>
<tr>
<td>Studio Classrooms</td>
<td>approx. 625 sqm</td>
</tr>
<tr>
<td>Art Studio</td>
<td>approx. 325 sqm</td>
</tr>
<tr>
<td>Artist-in-residence studio</td>
<td>approx. 325 sqm</td>
</tr>
<tr>
<td>Auditorium</td>
<td>approx. 593 sqm</td>
</tr>
<tr>
<td>Meeting rooms</td>
<td>approx. 130 sqm</td>
</tr>
<tr>
<td>Retail shops</td>
<td>approx. 400 sqm</td>
</tr>
<tr>
<td>Restaurants &amp; Café's</td>
<td>approx. 540 sqm</td>
</tr>
<tr>
<td>Games room</td>
<td>approx. 36 sqm</td>
</tr>
<tr>
<td>Administration &amp; operations dep.</td>
<td>approx. 185.65 sqm</td>
</tr>
<tr>
<td>Knowledge management dep.</td>
<td>approx. 448.6 sqm</td>
</tr>
<tr>
<td>Exhibitions, Events &amp; Activity dep.</td>
<td>approx. 106.37 sqm</td>
</tr>
</tbody>
</table>

Total approximated area = 12,910 sqm
8% of 12,910 for parking = 1033 sqm

Total approximated grand total = 13,943 sqm
CHAPTER 5

CASE STUDY

5.1 Case Study 1 (Context)

"When a region or a city invests millions in a major new cultural institution – it often ends up benefiting only the informed few that already have an interest in the arts. Not only does the MECA spill its activities into the public realm and the urban room, but the public is also invited to walk around, through, above and below the new cultural gateway. By inviting the art into the city and the city into the arts, the MECA will provide opportunities for new hybrids of cultural and social life beyond the specific definitions of its constituent parts." Bjarke Ingels, Founding Partner, BIG.

Source: http://www.dezeen.com/2012/06/20/meca-by-big-and-freaks-freearchitects/
The urban room allows everyday life of Bordeaux to flow through its generous frame along the promenade, inviting the art into the city and the city life into the building.

The multiple ramps and stairs of the building create an institution that is publicly accessible and welcoming on the inside as well as the outside.

The urban room and the informal setting of the stairs will make the M3CA clearly, clearly, and enduringly into the life along the Quai de la Cascade street and the new promenade.

During festivals or other special occasions in the city, the outside of the M3CA can be transformed into a stage for outdoor concerts, theatrical spectacles or art installations.
Ground Floor (+ 0.7 m)
Area Brutto: 4894 m²

Floor 01 (+ 6.75 m)
Area Brutto: 1588 m²

Figure 5.10: Ground floor MECA
Source: Archdaily.com

Figure 5.11: Floor 1 MECA
Source: Archdaily.com
Floor 04 (-18.9 m)  
Area Brutto 3572m²

Roof plan

Figure 5.12: Floor 4 MECA  
Source: Archdaily.com

Figure 5.13: Roof Plan MECA  
Source: Archdaily.com
Linear Organization

We propose a building integrated in the waterfront promenade of Bordeaux that will allow public life to flow through the MECA rather than merely surrounding it. All programs are organized as a public street leading through the building. The linear organization gives visitors a glimpse of all activities in the building. Rather than a stringent division between back and front of house the organization creates an experience of a house full of activity and people.

Loop

The 3 institutions and their shared facilities are gathered around a public space framing a fifth program - and outdoor urban open - open towards both Bordeaux and the Garonne river - as well as the OARA, ECLA and FRAC - left, right, above and below. A single loop of both public space and cultural institutions.

Urban room

The urban room will frame the everyday life of Bordeaux flowing through its generous frame along the promenade or to and from the river - and on special occasions it will turn into an urban stage, or an outdoor gallery to extend the art into the city as well as the city into the architecture.

Continuous promenade

Tailored to accommodate the proportions of the performance spaces, the working spaces and the art galleries the loop is skewed and distorted while fused to form a single urban framework. The pavement of the promenade rises to form the roof of the main lobbies - becomes the stage tower of the OARA, bridges across the promenade with the sky lit galleries of the FRAC and then returns vertically to the ground with the archives of the ECLA in order to reunite with the waterfront promenade once again.
BVG's proposal arranges the new center for contemporary art, the performing arts institution and the center for literature and movies around a public space open towards the city of Bordeaux and the Garonne River. The building is conceived as a single loop of public space and cultural institutions as the pavement of the promenade rises to form the roof of the main lobbies, ascends vertically along the stage tower of OARA, bridges across the promenade with the sky lit galleries of the FRAC and returns vertically to the ground at the archives of the ECLA in order to reunite with the waterfront promenade.

Figure 5.23: Exterior and interior spaces MECA
Source: Archdaily.com

This case study is located in a similar context compared to the selected site mentioned before. The project is located at a riverfront in France and deals with connecting its program to the waterfront as well as the surrounding. The concept of this project in terms of relating with the context is interesting and could be applied in a similar way to the proposed project in this report.

This project tries to draw in people into the project by creating a linear pathway connecting between the public street, into the building and out into the waterfront promenade. In doing so, people are invited into the building easily to take part in the activities happening in the building, creating an urban public room, where everyone is welcome to enjoy. Moreover, this also lets city life come into the building, and letting the arts connect back or infuse into the community. This could be a concept which could be used in the proposed project, as relating with the context in order to draw in people is included in the design scope of the project.

Furthermore, this project tries to capture the maximum benefit from its context by framing its view towards the riverfront by arranging the buildings around the urban room which is left open towards the riverfront. Everyone who uses this space could make use of the good view which it offers. Furthermore, other outdoor spaces are created framing the view towards the city skyline. This is another concept which could be used to make the best use of the context the building is located.
5.2 Case Study 2 (Facility)

The Norwegian city of Molde has just 25,000 inhabitants, but every July the biggest stars of jazz and about 100,000 jazz enthusiasts flock to the town’s world famous international jazz festival. In designing the city’s new cultural center, the challenge faced by 3XN was to create a building that was flexible and robust enough to provide a framework for cultural life on both scales.

The architectural solution is a structure where almost all surfaces and spaces have more than one function. Together with the building’s roof, an existing staircase next to the building constitute a total of three outdoor amphitheatres that collectively accommodate several thousand spectators. During the day the roof offers a café with outdoor seating, a recreational area with splendid views and exhibition space for the building’s gallery; while the staircase on the side of the building is an essential link between the city’s upper and lower districts.
Figure 5.27: Roof plan Plassen cultural center
Source: Archdaily.com

Figure 5.28: Main programs Plassen cultural center
Source: Archdaily.com
This case study provides some main programs which could be incorporated into the programs of the proposed project. One of the main spaces in this case study is the amphitheater which is designed to accommodate a large number of people during festivals and events. This space is interesting as the space is created as a flexible space which could also be converted to exhibition and outdoor activity space when needed. Moreover, even though the building can accommodate large number of people, the building is scaled down in a way to relate with the surrounding context. In addition, the library space, galleries, auditorium and meeting space in this project could be of reference to the proposed project in terms of its scale and number of users.
5.3 Case Study 3 (Facility)

Weston Family Learning Center

The new Learning Centre offers a major collaborative hub for community creativity and learning, while increasing the AGO’s ability to provide stellar art education for children, families, and adults of all ages. It houses a community gallery, a hands-on centre for young children and their parents, three seminar rooms, an education commons, a youth centre for young adults, and an artist-in-residence studio.

Active, hands-on, and social, the new Learning Centre is the city’s on-site and online studio for the celebration and teaching of art.

Client’s objectives were to create a space with increased: functionality; accommodating large groups, flexibility; maximizing program opportunities, accessibility; welcoming all users, integration; offering direct connection to the galleries above, transparency; a window into the creative process.

Figure 5.30: Main programs Weston family learning center
Source: Archdaily.com

Figure 5.31: Concourse level floor plan Weston learning center
Source: Archdaily.com
The active learning process provided in this project could relate with the hypothesis mentioned before for the proposed project. This project tries to explore the hands-on method for learning arts which they believe could enhance creativity. Moreover, this project tries to explore the idea of flexibility in using space as well as welcoming all users into the building. These are some of the concepts which the proposed project would like to explore as well. Hence, this case study is a useful reference for an active learning center allowing for creative development as well as community involvement. Moreover, programs proposed in this learning center such as the artist-in-residence studio could be applied in the proposed project to allow the tourists/foreigners to work with the proposed facility. Furthermore, the gallery spaces, seminar rooms and youth center could be incorporated into the proposed programs in the proposed project.
5.4 Case Study 4 (Theory)

Apart from the learning theory (active learning process) proposed for the project, one of the other main theories discussed was the theory of critical regionalism which would help define the direction of architecture in the proposed project. This theory was proposed in order to create a meaningful architecture which could integrate both modern and local issues in this globalized world. The following case study would help to understand several techniques and methods which could be used to integrate local issues with the modern influence taking over.

Yusuhara Town Hall

Yusuhara Town Hall

Yusuhara is a small town of about 4,700 inhabitants on the verdant, mountainous island of Shikoku, one of the least populated areas of the Japanese archipelago. The region of Yusuhara is a natural habitat of the Japanese cedar, known as sugi, a tree that can grow as tall as 46 metres. This was Kuma's material of choice for the town hall, not just as a veneer but also as the basic structural element.

For Kuma, the architect's mission is to stimulate, or rather, reawaken our senses, all too often buried under the weight of modern-day concrete boxes. Quality architecture means providing an experience so that "setting foot in a building... is like feeling", says Kuma. And this he achieves with materials, dialogue with the location, and harmony with nature. Kuma taps into much of the traditional Japanese aesthetic where the relationship between exterior and interior, the built and natural world is paramount.

Considering the snowing weather conditions, a large atrium is inserted, and an indoor plaza was created. The indoor plaza and exterior plaza, separated by a large sliding door used for hangars, becomes one only space which is used during spring festivals.

The main objective of the architect was to awaken the senses of the people through the usage of natural and traditional materials and relating back to the Japanese aesthetics where there is a relationship between interior with exterior and built and natural world. According to the architect, in this age, the senses of the people are buried under the weight of the modern day concrete boxes and the trust for traditional structures are diminishing. In order to relate with this issue, the architect used locally found wood as the main structural
element of this building unlike other buildings which usually uses wood as a material for the façade only. The architect tried to make the structures more pronounced by letting the structure be displayed in the main atrium space of the building as well as letting the structure protrude out of the façade. Furthermore, in order to bring back the relationship between interior and exterior spaces, the architect designed the atrium as a space which could be extended out to the outdoor plaza during the summer season. To relate with the context, its weather and geography, the architect also designed the atrium as a space which could also act as a common indoor space to be used during the snowing cold weather.

Along with using wood, the architect also used modern materials such as glass to allow for more transparency of the building and to let light and heat come into the building. Even though the architect tried to bring back the traditional architectural qualities and aesthetics of Japanese architecture, the architecture did not resolve back to the vernacular traditional Japanese architecture. However, the architect tried to integrate between modern materials and traditional materials to bring out the best benefits which the architecture could achieve through the integration. Moreover, the architecture tried to achieve the Japanese aesthetics of the relationship between built and natural through the usage of building materials in harmony with the local context and nature.

The idea of this project could be used in the proposed project to give a strong identity to the public architecture of the country and also relate with its local aesthetics. Moreover, these ideas could help to achieve a balance between the architectural issues of modern and local.
CHAPTER 6
DESIGN SCHEMATICS

6.1 Concept Development

The concept of the project is summarized from the thesis statement stated in chapter 1, which was formulated based on the data collected, issues, hypothesis etc. The keyword of the concept is concluded as “Infusion” for the project. According to the dictionary meaning of infusion stated in the Merriam Webster dictionary, infusion means “to cause or to be permeated with something (as a principal or quality), which alters for the better”. The dictionary meaning of infusion according to the Oxford dictionary is “to instill/introduce (a quality) in someone or something.” Based on these universal meanings of the word, the word ‘infusion’ is interpreted as follows

*Infusion*: “the introduction/re-introduction of something (quality, knowledge etc), into another thing which changes the face of both”

The following will discuss how and why the keyword was come up with along with what the project want to achieve through exploring this keyword. Shown below is a bigger picture/idea which could tell what needs to be infused into what.
The Maldivians as discussed in the above chapters lived a simple life in their communities, which made them to develop their own traditions and cultural knowledge and values. Every person had a piece of culture in them. However, in the globalized world, the culture is almost non-existent in the society which is represented in the diagram shown below:

![Diagram showing existing condition with little culture outside the pieces and almost non-existent inside.]

Therefore, the project wants to change this existing condition and would want to instill the cultural knowledge/values and qualities in a larger number of people in this globalized world, represented as below:

![Diagram showing aim of project to create more pieces with culture infused in it.]

Hence, the summary of the conceptual idea is shown below:

1. INTO GLOBALLY INFLUENCED LOCAL COMMUNITY
2. GLOBAL COMMUNITY THROUGH TOURISM
3. CHANGES THE IDEA/PERCEPTION OF LEARNING CULTURAL KNOWLEDGE & ITS DEVELOPMENT
4. GIVES A NEW CULTURAL DIMENSION TO TOURISM
5. CREATES AN EMPHASIS ON LOCAL CULTURE WITHIN THE GLOBAL INFLUENCED LOCAL COMMUNITY & GLOBAL COMMUNITY, CHANGING THE COMMUNITY ITSELF.
Since target users for the project also include tourists/foreigners, these users are also included in the process of infusion of cultural knowledge, since letting the tourists/foreigners understand about the culture of Maldivians, would change their perception of the place and would give a new cultural dimension to the tourism. The process of infusion targeting the local involves re-introducing local culture and traditions into the society which will change the idea and perception of learning cultural knowledge by the globally influenced local community and also can lead to the development of the knowledge. Along this process of infusing local culture into the global influenced community and global community, an emphasis is created on the local culture, which is what the project would want to achieve overall.

Upon exploring the idea of local culture infusion, it is also useful to understand the basic components which make up the culture. Hence according to the following diagram, local culture is made up of 3 basic components which are local knowledge, community spirit and nature. This was also represented in the upper half of the montage presented earlier.

As shown in the diagram, local knowledge exists within community, which in turn exists surrounded by nature. Hence, for the local culture to be complete, these have to exist together. Therefore, the very first conceptual diagram is modified to show these three components existing within the globalized community.
This diagram shows that when introducing local culture into the globalized community, the components of local culture are introduced into the global influenced community. Introducing the cultural knowledge alone will not give the sense of culture especially within the global influenced community. Hence, the cultural knowledge needs be bound to the globalized community through the community spirit/a new community which is formed. All of this in turn needs to be connected back to the nature since local culture and community is always related, connected and surrounded by nature.
Conceptual Models

The very initial idea is explored in this simple conceptual model. The brown box represents global influenced/ global community while the white one represents the local culture. When being separate elements, the hierarchy is on the brown box. However, once the white box is inserted into the brown box, it changes the hierarchy of the boxes. Emphasis is created on the void created by the insertion of the white box into the brown box. This tries to represent the idea of infusing local culture into the global influenced/ global community, making a difference and emphasis on it.

This is a simple model representing the components of the local culture. The box in the middle represents the local knowledge, while the space between the extrusions and the box represents the community and the white border surrounding it represents the nature. What this model wants to convey is that the local knowledge is always surrounded by the community/ community spirit which in turn is surrounded by nature. The openings between the extrusions lets the knowledge (the cube) also connect with the nature surrounding it.
This is the final conceptual model trying to combine the two ideas in the previous conceptual models. The transparent glass block represents the global influenced/ global community. The white boxes inserted into the glass block represent local knowledge while the opaque boxes represent community spirit. The model tries to convey the idea of infusion. The white boxes (local knowledge) are infused into the transparent box (global influenced community). The opaque boxes (community spirit) try to connect the white boxes together with the transparent box. In doing so, these opaque boxes also opens up to the surrounding through the cuts made on the transparent box. The outside of this transparent box is considered as nature. Hence, the opaque box (community spirit) connects all knowledge together, connecting it with the global influenced community and also connecting everything to nature. With the infusion of the local knowledge (white boxes) into the global community (transparent box), it changes the face of both. The face of the glass box is changed since the insertion makes it look more interesting or meaningful compared to just being a glass box. In the same way, there is a sense of elegance to the white boxes existing within the glass box and there is emphasis on it. Hence, this is the main idea of infusion which was tried to be interpreted at the beginning of the chapter.

**Infusion:** "the introduction/re-introduction of something (quality, knowledge etc), into another thing which changes the face of both"
6.2 Design Development

In order to come up with the schematics, physical analysis of the context was done to make the approach much stronger in terms of relating with context as well as the concept explained before.

Site Analysis

The site is located at the east edge of the city, facing the waterfront area on east. The north and west side of the site is surrounded by small scale residential buildings along with few institutional buildings while on the south side of the site, there is green areas.
Currently, the site is left as a vacant land used by the community unofficially as a recreation land. The main existing uses within the site are analyzed below:
The site is directly connected to 3 major roads in the city and is indirectly closely connected to some other major roads.

Since the city is small, analysis is done on city scale, which could support the schematic based on the conceptual idea which is to be explored. When looking at the city as a whole, it can be seen that green spaces and public open spaces are very few compared to the density of the city. Since currently the chosen site is one of the biggest public open space existing in the city, this issue is to be considered in the design.
The main axes and access for the site is studied in terms of the users of the project. The main public transport within the city and to the city is studied in order to understand the pedestrian movement and accessibility for both tourists and locals. Activities, facilities and uses are studied to understand the potential users to the site.
Based on the above analyses, main access for tourists and locals are defined as follows and axes which could cut through the site are defined as follows:

The site already has existing connections to the nature which could be addressed in the design. Active and passive areas of the site are defined to understand the location of programs within the site.
Based on the above analyses, it could be seen that there is possibility to connect the city with the waterfront/nature, through the site. Moreover, there is possibility to connect the access for both local and tourists, creating a common ground for both users. Moreover, there is possibility to connect between the active and passive zones within the site and surrounding the site.
Design Methodology

According to the conceptual idea described previously, the main idea which would be explored in the design is the integration of the learning programs with the globalized community and nature. Hence, importance would be given in the design to bring in the local community and to create spaces and programs for the community within the site, which in turn would create sense of community spirit. Furthermore, importance would be given in the design to create linkage of all the programs with nature. Following diagrams represent the main ideas which are experimented in the initial schematic studies.
Initial Schematic Study Models
Development of Schematic Study Models with further conceptual exploration

The following ideas were produced by exploring the conceptual idea in terms of site analysis done in order to come up with zoning within the site. The schematics which follow will have this main idea of zoning explored in the design.

- **Common Access for Both Locals and Tourists**
- **Common Area for Both Users**
- **Most Public/Common Area for Both Locals and Tourists with the Best View**
- **Most Suitable Areas Within Site for Public Related Programs**
- **Possibility to Locate Local Related Private Programs in This Area**
- **Possibility to Locate Local & Tourist Related Semi-Public Programs in This Area**
POSSIBILITY TO ORIENT THE BUILDINGS BASED ON CITY GRID LINES CUTTING THROUGH THE SITE AND MAKE MINOR CONNECTIONS FROM THESE AXES INTO THE SITE.

POSSIBILITY TO EXTEND THE GREENERY FROM AROUND THE SITE INTO THE SITE AND POSSIBILITY TO CONNECT / BRING IN SURROUNDING ACTIVITIES INTO THE SITE.

BUILDINGS ARE CONNECTED TO NATURE, PUBLIC SPACE / COMMUNITY TO SHARE THE CULTURAL KNOWLEDGE.
The following functional relationship diagram is also produced defining the programs in each zone, showing the connections between them. This diagram defines the main functional relationships in the following schematics produced, though little changes had been made in these relationships until the final design.
In order to further strengthen the conceptual idea of the design, the schematics were explored based on the following analysis. Vernacular architecture of the country is very much related to the local culture. The vernacular architecture of Maldives comprises characteristics of Asian as well as Islamic architecture since the country has its roots in the region and religion. Courtyards, timber structures, craftsmanship, layering of roofs, walls etc have been some of the major features or characteristics of Islamic and Asian architecture. Hence the following design schematics until the final design, tried to integrate these ideas with the site and conceptual analysis to come up with a more meaningful design. The following diagram summarizes the above mentioned idea, giving a clear picture of how these main ideas of Islamic and Asian architecture had been part of the vernacular architecture of Maldives.
CHAPTER 7
CONSTRUCTION PARTICULARS

7.1 Building Technology

-Tectonics of timber construction/architecture

In terms of building technology, one of the main ideas which will be explored is the idea of architectural tectonics, which was highlighted in chapter 2, under the theory of Critical Regionalism. As stated in chapter 2, this idea could help to bring more meaning to the architecture in this globalized world by exploring the former techniques and construction methods, but yet not reverting back to the vernaculars. Kenneth Frampton defines tectonics as the art of deploying construction technology in such a way that it forms an integral component of the design and actively helps to shape it. In this modern world, architects are trying to explore the idea of tectonics by using the modern technology and digital tools. These new technology are widening opportunities for architects and engineers to produce advanced geometries, which could also have expressive potential in buildings and construction. The technology does not only allow for the optimum structure, but it also influences the way people experience space in architecture, giving a poetic meaning.

Since, wood/timber is one of the main materials used in the vernacular architecture of Maldives, I would try to explore the tectonics of wooden construction/ tectonics of timber architecture in the project. Maldivian vernacular architecture mainly used locally found palm timber or imported teak wood through marine trading, in the earlier days to construct the roof structure, doors and windows. These wooden structures and elements had elegant skilled work of early carpenters embedded in it through the techniques of wood carving and lacquer work. Hence, these structures and elements of earlier days not only served an integral part of the building, but also had aesthetic value in it. Therefore, I believe, by exploring the techniques of wood integrated with the modern technology, it could elevate

28 http://infoscience.epfl.ch/record/174433/files/The%20tectonics%20of%20timber%20architecture%20in%20the%20digital%20age.pdf - The tectonics of timber architecture in the Digital Age

the vernacular techniques, giving the modern local architecture a new expression. Following are some examples of timber used in vernacular architecture of Maldives.

In the modern age, the use of computers has changed the industrial processing of materials as well the process of designing. Hence timber is also being developed which is enhancing its structural and technical properties. One of the main types of such timber used currently is glue laminated timber, whose properties have interested architects and engineers to fully explore it to produce expressive structures and space.

Structural glued laminated timber according to American Wood Council is defined as “(glulam) is a structural member glued up from suitably selected and prepared pieces of wood either in a straight or curved form with the grain of all pieces essentially parallel to the longitudinal axis of the member.” Furthermore, they state that “Glued laminated timber members are produced in laminating plants by gluing together dry lumber, normally of 2-in. or 1-in. nominal thickness, under controlled conditions of temperature and pressure. Members with a wide variety of sizes, profiles, and lengths can be produced having superior characteristics of strength, serviceability and appearance. Glued laminated timber beams are manufactured with the strongest laminations on the bottom and top of the beam, where greatest tension and compression stresses occur".
Following is a table which shows the economical spans glulam can take.

Table 7.1: Economical Spans for Glue Laminated Timber Framing Systems

<table>
<thead>
<tr>
<th>Type of Framing System</th>
<th>Economical Spans (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROOF</strong></td>
<td></td>
</tr>
<tr>
<td>Simple Span Beams</td>
<td></td>
</tr>
<tr>
<td>Straight or slightly cambered</td>
<td>10 - 100</td>
</tr>
<tr>
<td>Tapered, double tapered-pitched, or curved</td>
<td>25 - 100</td>
</tr>
<tr>
<td>Cantilevered Beams</td>
<td>up to 90</td>
</tr>
<tr>
<td>Continuous Beams</td>
<td>10 - 32</td>
</tr>
<tr>
<td>Girder</td>
<td>40 - 80</td>
</tr>
<tr>
<td>Three-Hinged Arches</td>
<td></td>
</tr>
<tr>
<td>Gothic</td>
<td>40 - 90</td>
</tr>
<tr>
<td>Tudor</td>
<td>20 - 120</td>
</tr>
<tr>
<td>A-Frame</td>
<td>20 - 100</td>
</tr>
<tr>
<td>Three-centered, Parabolic, or Radial</td>
<td>40 - 250</td>
</tr>
<tr>
<td>Two-Hinged Arches</td>
<td></td>
</tr>
<tr>
<td>Radial or Parabolic</td>
<td>50 - 200</td>
</tr>
<tr>
<td>Trusses (Heavy)</td>
<td></td>
</tr>
<tr>
<td>Flat or parallel chord</td>
<td>50 - 150</td>
</tr>
<tr>
<td>Triangular or pitched</td>
<td>50 - 90</td>
</tr>
<tr>
<td>Bowstring (continuous chord)</td>
<td>50 - 200</td>
</tr>
<tr>
<td>Carrying</td>
<td>40 - 60</td>
</tr>
<tr>
<td>Trusses (Light)</td>
<td></td>
</tr>
<tr>
<td>Flat or parallel chord</td>
<td>20 - 50</td>
</tr>
<tr>
<td>Triangular or pitched</td>
<td>20 - 75</td>
</tr>
<tr>
<td>Tie arches</td>
<td>50 - 200</td>
</tr>
<tr>
<td>Dome structures</td>
<td>200 - 500+</td>
</tr>
<tr>
<td><strong>FLOOR</strong></td>
<td></td>
</tr>
<tr>
<td>Simple Span Beams</td>
<td>6 - 40</td>
</tr>
<tr>
<td>Continuous Beams</td>
<td>25 - 40</td>
</tr>
</tbody>
</table>

Based on the above mentioned characteristics and properties of glulam, glulam is becoming one of the main timber construction material in the building industry. Below are some examples of how glulam has been explored in some buildings, in terms of its tectonics.

This design consists of glulam, traditional 3 hinge arches. On the outside edge glulam follows the straight wall (arch leg) up to the eave (arch knee), then follows the straight roof slope (arch arm). The construction and material gives a new expression to the space.

This design consists of a glass oculus supported by glulam space frames. Glulam mullions and glulam ribs were connected by pre tensioned steel connectors. In total, there are 26 vertical mullions, 26 curved ribs, 76 louver and 88 compression struts. The frames are connected with 249 unique steel assemblies and 42 rod assemblies. Glulam does not only allow for a curved construction, but changes the experience of the interior space as well, by letting the construction be exposed in the interior. The allowance of light into the space through the louvers gives a poetic meaning to space.


Passive Design

The other main approach in building technology is to study about the sustainable/passive design in architecture. The major principles explored would be about the passive cooling/heating and day lighting/natural lighting techniques. As mentioned under the theory of Critical regionalism in Chapter 2, one of the critical approach to architecture is trying to explore the geography of which the architecture is set. Since Maldives is located in a region where there is sunshine almost throughout the year, the cooling techniques could help to save energy used by the building and also would provide more thermally comfortable indoor as well as outdoor spaces. Natural lighting techniques would achieve equivalent of mentioned, while also allowing the architecture to experiment with the quality of indoor and outdoor spaces. Below are data regarding the geographical context of Maldives, provided by the Maldives Department of National Planning.

Figure 7.2: Sunshine & Rainfall for Male' by month, 2011 - 2012
Source: Department of National Planning – Statistical Yearbook 2013

Figure 7.3: Yearly Average of daily maximum and minimum temperature, 2012
Source: Department of National Planning – Statistical Yearbook 2013
Among the first thing to consider when doing a passive heating or cooling approach is to orient the building in a way to reduce heat gain/loss. North side of the building receives indirect sunlight while East and West of the building are exposed to sunlight in the summers. Hence east-west facing openings/windows of the building can let in more heat into the building when compared to north or south facing windows. An overhang on the north side can be enough however, on the East and West Direction, its preferred to have less openings. In case that the openings or windows are important on East and West Direction, shading devices such as horizontal/vertical louvers, overhangs, shading from trees etc can be used to minimize the heat gain.32

Figure 7.4: Wind Direction and speed by month, 2012
Source: Department of National Planning – Statistical Yearbook 2013

Figure 7.7: Different shading and sun angle
Source: http://www.yourhome.gov.au/technical/fs44.html

Figure 7.8: Solar Shading Devices
Another technique which can be used to reduce heat in the building is natural ventilation. There are two basic types of natural ventilation which are wind driven ventilation and stack ventilation. Wind driven ventilation uses natural forces of wind while stack ventilation requires a pressure difference.

The orientation of building, form, types, sizes and shape of openings, construction method and detailing etc can affect the wind driven ventilation process. Building oriented so that the wind wall is perpendicular to the direction of wind can allow good cross ventilation. However other architectural elements can also be introduced to channel wind to certain areas.\(^{33}\)

\[\text{Figure 7.9: Wind flow around buildings on elevation} \]
\[\text{Source:} \quad \text{http://gbtech.emsd.gov.hk/english/utilize/natural.html}\]

\[\text{Figure 7.10: Orientation for maximum passive ventilation} \]
\[\text{Source:} \quad \text{http://sustainabilityworkshop.autodesk.com/b}\]

\[\text{Figure 7.11: Wind flow patterns around buildings depending on orientation} \]
\[\text{Source:} \quad \text{http://www.islandnet.com}\]

\[\text{Figure 7.12: Urban Wind Flow patterns with various simple building shapes and spacing} \]
\[\text{Source:} \quad \text{http://www.islandnet.com}\]

\(^{33}\) http://gbtech.emsd.gov.hk/english/utilize/natural.html
As stack ventilation occurs due to pressure difference, hot air usually rises up while cool air is replaced back down. If openings are located one on a lower level while one on a higher level, it will allow fresh cool air to be in taken into the building while hot air which rises up can be expelled out. This will in turn generate ventilation and allow for a cooler environment.

The following diagram shows how stack ventilation is used in a building and the different techniques which can be used to allow stack ventilation to happen.
Natural lighting techniques can also help to reduce heat entry into the building from East-West direction, yet enabling to use the sunlight to enter and light up the building in more indirect ways. This will not only reduce heat gain but can also create different interior spaces, controlling the amount of light people will perceive in a certain space. Following shows some typical natural lighting techniques used by architects.

Figure 7.16: Natural Lighting Techniques
There are several visual acuity and performance issues related to the efficient use of natural lighting. When using natural lighting in a building, the even distribution of the lighting needs to be considered in order to reduce visual discomfort. Moreover, glare or excessive brightness and contrast should be reduced to produce pleasing environment and to maintain a same field of view, which can also increase the performance of human eye. Even though the brightness of light needs to be controlled, it is good to introduce a variety of lighting into the building in order to take away the dullness in design. Hence usually techniques like a beam of daylight are introduced in circulation areas for visual interest and to lead people in the buildings.\(^\text{34}\)

\(^\text{34}\) http://www.wbdg.org/resources/daylighting.php
7.2 Building Codes

Building Codes in Maldives are based on the Planning Regulation made by the Ministry of Housing and Urban Development of Maldives. Since the project site is located in Male’ city, the building codes for this project is based on the "Male’ Planning Regulation", issued on July 2008 by the ministry. This regulation is mainly based on residential buildings or small scale buildings. However according to the ministry, any other project type should also follow the regulations stated in this Planning Regulation since this set of regulations are the only regulations implemented in the city currently, regardless of the project type.

Building Height Calculations

Building height is considered as the height between the pedestrian pavement level until the upper edge of the roof beam or roof slab.

There are 3 main ways which could be used to calculate the building height. Building height can be calculated based on area of the site, the width co-efficient of the site or the width of the main entrance road to the site.

Width co-efficient of the site is calculated by using the formula below:

\[ \text{Width co-efficient} = \frac{1}{\text{length}} \times \text{Area} \]
Maximum allowable height can be calculated based on the width co-efficient if the width co-efficient is smaller than $1/10^{th}$ of the square root of building area.

Formula for building height using this method is $1.2 + 0.3875 \times \left( \frac{\text{width co-efficient}}{0.8} \right)^2$

Area of the building can be used to find allowable height if the width co-efficient is greater than or equal to $1/10^{th}$ of the square root of building area.

Formula for building height using this method is $1.2 + 0.3875 \times \text{building area}$

-If, other two methods are difficult to be used, the third alternative method to calculate building height is using the width of the main entrance road into the site. The table provided below gives the allowable heights based on the width of the roads. This method has been used by the project since the project scale is larger than the usual projects on which the above mentioned formulas can be used.

<table>
<thead>
<tr>
<th>Width of Main Entrance Road</th>
<th>Allowable Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1.219 M</td>
<td>NO BUILDING ALLOWED</td>
</tr>
<tr>
<td>BTWN 1.219 - 1.524</td>
<td>3 STOREYS OR MAX. 9M</td>
</tr>
<tr>
<td>BTWN 1.524 - 1.829</td>
<td>NOT MORE THAN 8 STOREYS OR MAX. 25.20 M</td>
</tr>
<tr>
<td>&gt; 3.048 M</td>
<td>UPTO 30.48M</td>
</tr>
</tbody>
</table>

There are two categories of buildings. Buildings which cannot go higher than 30.48m or buildings which can go higher than 30.48m, based on the following conditions. However, maximum allowable height in Male’ is 45m, regardless of the conditions. Conditions for buildings able to go higher than 30.48m are as follows:
Condition 1
Allowed if the area of building is minimum 6000 sqft or 557.418m

Condition 2

Condition 3

Condition 4

Condition 5

To summarize the conditions, it can be said that building area should be minimum 557.418m for the building to go higher than 30.48m. However, the length of the road facing the road should be of minimum 15m and the road width should be of at least 7.620m. If first two conditions are fulfilled and the road width is at least 6m, the building can be setback until 7.620m to go higher than 30.48m. If there is an opposite building going the same height and road width is at least 6m, then setback of the other building is not considered when calculating the setback of the building.

Building Setbacks

Since the proposed project, according to the regulations, can go higher than 30.48m, the setbacks of buildings which can go higher than 30.48 are considered. The following are detail diagrams of the setbacks.
The foundation of buildings which can go beyond 30.48m needs to be setback 2m from the road. However, the 0.457m of the building can be extruded to the mentioned setback, above 2.743m from the road level. The given setback is considered as part of the road and should be of same level as the pedestrian walkway.

Ventilation & Sunlight

Regulation states that 10 percent of each floor area should have direct opening to an open space. An opening is considered to ventilate 6m on the center of the opening and 4m from each side of the window. Openings are considered the below shown types of windows.
Glass blocks, fixed glass windows or the fixed side of the sliding doors are not considered as windows which can ventilate.

**Railings on Stairs, Balcony, Terrace etc**

The stairs, balcony or terrace which are up to 21m above ground level are required to have 1m height in the railings or parapet provided. If railings or parapet wall are provided above 21m height from ground level, the height of railings or parapet wall should be at least 1.2m. Railing details are provided below:

Any gap in the railings or parapet wall should not be greater than 125mm.

Height of railings on stairs should not be less than 850mm.

**Parking Area**
Parking area specified in the regulation is divided into two parts which are parking for residential and parking for commercial buildings. The parking regulation discussed in this report is for parking area in commercial buildings.

The parking area should not be less than 8 percent of total built area. Moreover, it should not be less than 50 percent of building footprint. However, this area is not required to be located on the ground floor. Parking area can also be divided into zones or levels but each division should not be less than 1.5 percent of total area. The parking area specified here does not include the driveways/ramps required for the circulation of vehicles.

Setbacks given for buildings higher than 30.48m can be used for motorcycle or bicycle parking as shown below:

Since Male' is one of the smallest island capitals in the world along with the problem of overcrowding, the land plots are of small scale. Hence, the regulations are more focused on the issues discussed above such as building heights, ventilation and sunlight etc. These regulations have many differences compared to regulations formulated in countries with more development. Therefore, some reference need to be made along the design process, to regulations made in other developing countries, which could be of use to the proposed building scale and type.
CHAPTER 8
FINAL DESIGN

8.1 Final Design Idea

- Main intersections of axes passing through the site to create public courtyards.
- Minor axis diverted to lead people in to site and orientation of courtyards rearranged to place building masses based on site analysis.
- Activities determined for courtyards based on zoning and programs. Orange colour for more locally active activities, yellow for activities mediating between active & passive, blue for more passive activities.
- Main courtyard in the middle to connect between two courtyards where axes meet.
- Masses arranged to create the courtyards.
- Verandahs/walkways used to create passage on ground yet allowing to create courtyards.
Emphasis created on main courtyard and main entrance through scale of building.

Second layer of facade creates emphasis on connecting all the buildings and emphasizing on secondary courtyards.

Defined public space using courtyards within the continuity of public spaces around.

Public space (community) and building programs (knoll-edge) connected and surrounded by nature.
8.2 Final Models
8.3 Layout Plan
8.4 Floor Plans
8.5 Mechanical System

VRV SYSTEM

WHAT IS VRV?

VRV is the latest and most revolutionary technologies used for large sized buildings.

The system offers large outdoor capacities, greater energy savings, easier installation, longer actual and total piping, and more.

The VRV III Series offers an energy saving alternative to traditional centralized equipment. Its remarkable compact and lightweight structure makes installation of VRV technology in large buildings possible. At only 330 lbs. and less than 40" high, the VRV III Series can take a ride up the elevator to be installed in a machine room.

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Individual Control</td>
</tr>
<tr>
<td>- Saves Energy</td>
</tr>
<tr>
<td>- Conserves space</td>
</tr>
<tr>
<td>- Wide selection of models</td>
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<tr>
<td>- Superior design flexibility</td>
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<tr>
<td>- Simplifies installation</td>
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<tr>
<td>- Broad temperature range</td>
</tr>
</tbody>
</table>

Figure 8.1: VRV connections and pipe length details

Figure 8.2: VRV connections in main building
Source: Author

Figure 8.3: VRV connections in library building
Source: Author

MULTI SPLIT SYSTEM

A system where multiple indoor units can be coupled with a single outdoor unit for ultimate some control and comfort

ADVANTAGES
- Space saving installation
- Independent control
- Convenient and economical
- Can be installed on large structures and have long pipe length

Figure 8.4: Multi split connection in classroom building
Source: Author

Figure 8.5: Multi split connections
Source: www.google.com

36 http://www.airconditioninglondon.net/multisplit.php
8.6 Elevations

Elevation A
Scale: 1:200

Elevation B
Scale: 1:300

Elevation D
Scale: 1:200
8.7 Sections
8.8 Exterior Perspectives
8.9 Interior Perspectives
Bibliography


Dhivehi Thaareehah au alikameh, Male’, Maldives; National Center for historic and linguistic research, 1990

Silberman, Mel, Active Learning 101 strategies to teach any subject, Pearson, March 1, 1996

Statistical Yearbook of Maldives, Male’, Maldives: Department of National Planning, 2012

Periodicals

Master, Tom. Lonely planet – Maldives, 8th edition November 1 2012, pg144

Web resources:

Indigenous knowledge discussion:


http://www.worldbank.org/afr/ik/basic.htm

Maldives culture and background discussion:

http://worldmap.org/maps/other/profiles/maldives/Maldives%20Profile.pdf
https://en.wikipedia.org/wiki/Maldives#cite_note-11
http://creativitymaldives.org
http://www.visitmaldives.info/maldives-music-a-dance.html
http://www.fao.org/docrep/x5627e/x5627e0a.htm
http://mrc.gov.mv
http://www.nationallibraryofmaldives.com/national.php
http://mnu.edu.mv
http://hello-maldives.com/ecotour.htm
http://creativitymaldives.org/index.php/authors-artists/maizan-adam-maniku/
http://maldives.tourism-asia.net/male-capital-of-maldives.html

Maldives development statistics:

Hulhumale’ development information:
http://www.hdc.com.mv

Statistical information of tourism in Maldives:
http://www.tourism.gov.mv

Statistical information about demographic and geographic information and statistics of Maldives:
http://www.planning.gov.mv

Discussion about active learning:
http://geoffpetty.com/for-teachers/active-learning
http://lyceumbooks.com/pdf/HowToTeachEffectively_TypesofLearners.pdf
http://www.jisc.ac.uk/uploaded_documents/JISClearningspaces.pdf-DesigningSpacesfor
effectivelearning/aguidedto21stcenturylearningspacedesign
Case studies:

http://www.archdaily.com
http://www.dezeen.com
http://www.topboxdesign.com

Building technology discussion:

http://infoscience.epfl.ch/record/174433/files/The%20tectonics%20of%20timber%20architecture%20in%20the%20digital%20age.pdf – The tectonics of timber architecture in the Digital Age
http://www.wbdg.org/resources/daylighting.php

Mechanical system discussion:

http://www.daikinac.com/content/commercial/vrv/water-cooled-vrv-the-next-generation-of-vrv/
http://www.airconditioninglondon.net/multisplit.php