POLITECNICO DI TORINO

DIGEP - DEPARTMENT OF MANAGEMENT AND PRODUCTION ENGINEERING

Master of science degree in Engineering and Management Master's degree thesis

Corporate Entrepreneurship in Smart City: Analysis of Business Strategies in Smart city



Supervisors: Prof. Paolo Chiaberti Laureandi Hari Prashanth Natarajan 251815 Academic Year 2017-2020

Forewords

The following work has been developed as master's thesis in partial fulfilment of the requirements for the degree of Master's in Engineering and Management at Politecnico di Torino. The author expresses his availability for further clarification of the topics here presented.

For further questions about this work, please contact the author at the email address below:

Hariprashanth.natarajan@studenti.polito.it

Abstract:

The study aims to analyse strategies in smart city for services industries from a Corporate entrepreneurship standpoint and for this purpose will use the concept of Scripts and Schemas and its relationship to corporate strategies to propose a hypothetical Entrepreneurial model as a tool for strategic guidance. For this purpose, I intend to identify smart approaches and contextual strategies adopted across major cities. A detailed analysis of the observed strategies based on various established research papers and case study results will be summarised in the chapters to be followed in the dissertation

Factor conditions of well-developed cities are analysed to understand global initiatives. Then important entrepreneurial characteristics and opportunities in Smart city will be discussed to explore the scope of entrepreneurship. Further, various cases studies around business strategy, corporate strategy, and global leadership allow to understand how opportunities are capitalised by innovative means.

Acknowledgement

I wish to extend my sincere gratitude to Prof. Paolo Chiaberti for creating an opportunity to pursue a high level of learning, to overcome problems, and to experience the research work culture.

I would like to thank Mr. Davide Tuzi for his kind support, and valuable suggestion. Finally, I would like to express my special thanks to Almighty, family and friends for their dearly support.

Thesis Motivation

The objective of the thesis is to get answers for evolving and widely discussed questions: Why smart city? Why entrepreneurial approach? Why do they need it? Why adopt innovative approach? Why base your strategies on contextual conditions? Since the game arena in which the industry players were playing are constantly changing and corporate entrepreneurship can no longer imitate well-established corporate cultures that may become extinct for the next decade. Hence, we take a deep dive into evolving smart cities, corporate entrepreneurship, and industrial strategies. Since the new arena is a smart city, evidence show disruptive approaches suitably leveraging on given conditions. Also, it is more pressing to research into this area given the speed at which technologies and new venture arise in the urban clusters and globalisation. Various research papers are available on business strategies, entrepreneurship, smart city concepts which were observed with different perspective to project the exactness yet without much dynamism. It is in my interest to analyse the same field and research works of highly knowledgeable authors through the lens of a dynamic entrepreneurial approach. This study has carefully relied on well-established research papers & books and adopted sufficiently for the development of an entrepreneurial approach which could be used for developing a framework in the future work.

Contents

List of Figures
List of Tables
1. Chapter 1
1 Introduction 1
1.1 Key insights from the Literature131.2 Causation and Effectuation Approach191.3 Conformity Analysis 1.201.4 Corporate entrepreneur continuum.22
2. Chapter 2
2.1 Introduction: Smart city classification based on technological approaches and its strategic fit with market-driven approach
2.2. Background
2.3 Visualization of Smart City Evolution:
2.4 Analysing Smart city cases based on Project type
2.5 Six Characteristics of Smart city and its association with Entrepreneurship 35
3 Chapter 3
2.1 Introduction: 40
2.2 Examining Dusiness model actterns
3.2 Examining Business model patterns
3.3 Case study illustration of the discussed patterns
4. Chapter 4
4.1 Methodology
4.2 Analysing Scripts & Schemas relevance with smart city using conformity test 72
4.3 Analysing Smart city dimensions using conformity test
4.4 Examining Entrepreneurial Opportunities associated with smart city characteristics

4.5 Analysis of Business Pattern and Business Shifts from entrepreneurial perspective.	76
4.6 Development of the hypothetical Entrepreneurial model	85
4.7 Conclusion and Future works	92

Bibliography	

List of Figures

- 1.1. Entrepreneurial response and reaction continuum
- 1.2. Stages of response to being competitively lost
- 1.3. Strategic flexibility zone (blue)
- 1.4. Learning Path of firm
- 1.5. Schematic representation of Corporate Entrepreneurial schemas and scripts
- 1.6. Dynamic model of effectuation
- 1.7. 2019- Innovation trend
- 1.8. ICT Growth over time
- 1.9. E-commerce user profiles before and during covid-19 crisis.
- 2.1. Smart City Evolution
- 2.2. Six Smart City characteristics
- 3.1. Business model: a) Backstage, b) Profit formula and c) frontstage
- 3.2 Visionary model
- 3.3 Tesla motors typical business model
- 3.4. Repurpose Strategy
- 3.5. Channel Kings
- 3.6 Disintermediation strategy
- 3.7 Gravity Creators Strategy
- 3.8. Lock in effect Strategy
- 3.9. Resource Driven Strategy
- 3.10 User Base Castling strategy
- 3.11 Platform Castling Strategy
- 3.12 IP Driven Strategy
- 3.13 Differentiation Strategy
- 3.14 Activity Differentiability- Sustainability Strategy
- 3.15 Speed Masters
- 3.16 Activity Speed Driven Strategy
- 3.17 Build to order strategy: a) Basic model, b) Dell business model
- 3.18 Typical Scalers business model
- 3.19 Delegators strategy of IKEA
- 3.20 Licensing strategy
- 3.21 Recurring Revenue Strategy
- 3.22 Freemium Strategy
- 4.1 Modified version of dynamic effectuation using scripts and schemas
- 4.2. Characteristics of Business model having a Local pitch/geographical stickiness
- 4.3 Characteristics of Disruptive business model having a Global Pitch

- 4.4 Framework of Entrepreneurial Action based on uncertainty
- 4.5 Example of Internal Scripts & Schema flow in an organisation (Global

approach) adopted from the book "Invincible Company".

- 4.6 Scripts and Schemas mapping with strategy development
- 4.7 Strategy pattern approach to strategy formation for new venture
- 4.8 Manifestation model adopted from Nicholls Balanced score card approach
- 4.9 Overview of the Entrepreneurial approach for new ventures
- 4.10 Hypothetical model of Entrepreneurial Approach for Smart city: 1.1. Global business orientation, 1.2. Localisation of business, 1.3. Entrepreneurial Approach model

List of Table

- Table 1. Alignment of entrepreneurial attributes with stages of bewilderment
- Table 2. Conformity Test
- Table 3. Project Box Types
- Table 4. The classification and status of various smart cities

Table 5. E-services that are being offered by smart cities and market-driven project assignment

- Table 6. Similar business conditions in terms of e-Service groups
- Table 7. Entrepreneurial opportunities corresponding to Smart city characteristics
- Table 8. Characteristics of E-ventures in Smart Cities (Global approach)
- Table 9. Methodology
- Table 10. Entrepreneurial Schemas and Scripts Conformity
- Table 11. Smarty Typology characteristics and Dimensional conformity
- Table 12. Entrepreneurial Opportunities associated with smart city characteristics
- Table 13. Business Patterns in association with Smart city characteristics
- Table 14. Business Pattern shifts in association with Entrepreneurial Approaches

1. Introduction to Corporate scripts and schemas:

In modern era forms find themselves in a dynamic environment, continuously striving to outside competition. Only that, the source of competition has changed, with changed organisational approaches, business models patterns and Strategic postures. A firm may have to compete in various fronts of the business, depending on the challenges and nature of the competition. For example, technologies in the early 20th century has become obsolete compared to the technologies available today, Over the decade increase in the development of new technology has accelerated. Other socio-economic and political factors such as the Labour market, legal, regulations, supply/distribution channels clusters have changed because of globalisation. Thereby, the competitive landscape and trends across the globe has affected the way a firm manages to survive and process information. With the landscaping referred to as competition, it is believed that corporations like individuals become lost when landscapes are unfamiliar. The state of being lost is a consequence off poor decisions, interpretations, and response actions by a firm, requiring adaptability speed flexibility aggressiveness and innovation.

If a firm is struggling to survive, it is not prepared to react swiftly to a novel situation which can be described as an unfamiliar environment as exemplified earlier, and hence are predisposed to taking decisions based on old strategic beliefs and knowledge structure. They are subject to bounded rationality which are governed by old schemas and scripts. Therefore, schemas are knowledge structures used to categorise and discern relationship which helps to rationalise complex environment. While scripts are hypothetical cognitive structures that help take appropriate actions and helps to navigate complex competitive domains, thereby guiding organisation behaviour. Based on the case study of Kodak, bounded rationality problem was a strong case characterised by patterns of short cut decision-making unfit to the environmental trends or because of poor recognition of the environmental trends. Before the paradigm shift from camera roll to digital camera even happen, Kodak's early launch of digital cameras failed to capture value and cannibalised their existing product portfolio and businesses losing the trust and loyalty from their subsidiaries. In this case, the organisations script and schemas at the top tier management were constrained by an unfamiliar environment. It required an updated version of their schemas and scripts. With an updated schema, a firm will be able to understand information from outside-in and translate to an updated script guiding their behaviour. Currently, countries, global and regional businesses have suffered economically due to the Covid-19 crisis. In such an unprecedented condition, various countries like Italy and Singapore, government, and stakeholders, ensured economic sustainability by effectively adopting ICT resources in their daily routines, subtending major losses. Such enactments are attributed to temporal adaptability of their current schemas and scripts aiding to be prepared and develop an appropriate path-dependent schema.

1.1.Key insights from the Literature:

1.2.1 Incongruence of Firm's Schema & Scripts:

With appropriate scriptures creamers managers is available to navigate through complex environmental conditions to make business decisions to resolve uncertainties however as the uncertainty or unfamiliar competitive environments change radically or rapidly scripts and schemas that facilitated before becoming maladaptive and inappropriate for the new environment. At this stage, the firm is identified of being **competitively bewildered**. Under such circumstances the firm is unable to interpret the dynamic environment and unable to take appropriate action. In this scenario the firm is competitively bewildered as the old scripts and schemas becomes inappropriate referred to as **incongruence** between a firm's scripts and schemas and its competitive environment. This stage is often the result of changing landscape forces while the scripts and schemas of the past persist.

Ability to comprehend a situation (schema) to resolve uncertainty and unfamiliar landscape and enactment (scripts) are critical for a proactive entrepreneur. Under increasingly aggressive and competitive environment firms are inclined to the exigencies of new adaptations. Firms are predisposed to their old scripts and schemas which are maladaptive against the novel situation.



Fig 1.1: Entrepreneurial response and reaction continuum

1.2.2. Stages of responses to being lost

Companies become lost when their schemes & scripts they have relied on in the past are no longer accurate or appropriate in the new environment. In mid-20th century it is believed that people had a sense of direction and had the skill of reading subtle cues from the environment and thereby able to update their mental maps of competitive forces and enact accordingly. Hence the state of being lost is the state arrived when mental maps have not been updated despite unfavourable signals from the environment. Bounded rationality seeps in when organisation rationalise based on the expectations that signals exists, when they are not. Research indicates an organisation goes through five stages of being lost. The first is the denial of being lost, leading them to force a fit of their scripts and schemas with the new environment. Second, the realisation that one is lost that downfalls to seeking a survival emergency. In this stage, strategic guidance and behaviour patterns become unproductive, frantic, and aggravating risks further. Third stage, the individual is emotionally expended, trying to find an environment that fits their current schema and script, after acknowledging failure of previous strategic fitness. In the fourth stage, rational and emotional deterioration sets in after not being able to resolve the perplexing gap between mental map and the environment yet waiting for a rescue entity from the environment itself. Finally, in the fifth stage, individual resigns to acceptance of getting lost. At this point new mental maps are believed to be formed.



Fig 1.2. Stages of response to being competitively lost

1.2.3.Corporate Entrepreneurship as strategic concept:

Sometimes companies despite being lost, hold the ability to influence the environment. According to researchers, "causal directions interact in an iterative, dynamic process." As such, "strategy defines niches the landscapes for attention and the environment through customer needs and competitive forces, induces strategic adaption". This suggests that contents of a strategy should align with the dynamics of the competitive domain. Since in a turbulent environment, the competitive dynamic shifts are frequent, to avoid incongruence of strategic decisions (owing to old mental maps), strategic flexibility is required. **Strategic flexibility** refers to wide range of strategic responses to imminent competitive or environmental changes. Such capability comes with **frequency of deployment** of those strategic responses to subtle cues out there. Firms may also acquire such a capability through **cooperative endeavours** to learn how to compete in the new competitive landscape. This leads me to position the firm in the blue zone in the fig 2.3.



Fig 1.3. Strategic flexibility zone (blue)

The firms after suffering the competitive bewilderment, follow a learning path. They would either adapt their old scripts and schemas to new environment until completely shifting new scripts and schemas. By adaptation, here it means, finding niche areas

where, current scripts and schemas could work, while unlearn gradually and replace it with appropriate strategies. While a proactive firm continually innovate parts of their business value chain, business model or internal activity and if necessary, replace them with updated strategies resulting in a **high-level strategic flexibility** (Fig 2.4). As exemplified earlier, the frequency of adapt, unlearn, replace, and invent will define the strategic character "bewilderment Schema" of a firm in a dynamic landscape.



Fig 1.4. Learning Path of firm

The literature translates the corporate entrepreneurship as competitive bewilderment schema through five capabilities:

- Adaptability
- Speed
- Flexibility
- Aggressiveness
- Innovativeness

These capabilities allow any company to reinvent themselves and establish the position of being **proactive** as in Fig 2.2. The following table describes how the five capabilities align with the stages of bewilderment stated earlier in section 2.3.

Five Attributes of an Entrepreneurial Firm	Five Stages of the Bewilderment Process	How the Entrepreneurial Attribute Assists in the Bewilderment Stage
Adaptability	Denial	Firms that are adaptable will be more prepared to realize a need for and implement change rather than denying the environment has changed
Speed	Realization	A firm with the ability to rapidly deploy rational strategic actions can avoid the frantic and unproductive responses to realizing their cognitive schemas no longer fit the environment
Flexibility	Strategizing	A firm that is flexible will be able to avoid attempting to force its old schemas to fit the new environment. Rather, managers will be willing to change the old schemas and scripts to fit the new environment
Aggressiveness	Deterioration	Aggressive firms will continue to pursue other actions to compete in the new environment instead of resigning to the fact that what they've done has failed
Innovativeness	Acceptance	Once an innovative firm has accepted that the environment has changed, they will be able to create new schemas to compete effectively in the new environment

Table 1: Alignment of entrepreneurial attributes with stages of bewilderment



Fig.1.5. Schematic representation of Corporate Entrepreneurial schemas and scripts

1.2.Causation and Effectuation Approach:

Based on the research studies of [Maura McAdam & Cunningham], an effectuation is defined as "to the extent we can control the future, we do not need to predict it". At the core of this effectual approach is the idea action taken to create value is path dependant and depends on the transformation of means that are readily available rather than idealised future goal. The means are subject to contextual conditions along with individual traits such as tastes, value, attributes, preferences, passion, interests, prior knowledge, education, experience, expertise, contacts, and the network of contacts. While the contextual conditions are constantly evolving and so is the individual's flexibility and adaptiveness, making effectuation an intuitive approach.

In contrast to effectuation, causation approach refers to the traditional entrepreneurship that involves planning, forecasting, and intensive scanning regime for opportunity search. Causal approaches theorise reasonable extrapolation of causal relationships to predict the future.

Since there are nuances to each approach described above, its abundantly necessary to combine them and attempt to comprehend the circumstances entrepreneurs should deploy each strategy.

Entrepreneurial intent and behaviour guidance model: *Combination of causation and effectual approach:*

Combination 1: Higher degree of prediction coupled with lower degree of control allows appropriate planning – a strategy that implies prediction as basis for action.

Combination 2: Higher degree of control and lower degree of prediction allows a transformational strategy using the current means with collaborative and co-creative approaches to build a possible future.

Trigger: High degree of perceived uncertainty and a less advantageous resources trigger effectual logics in the planning to action strategy. Of the above-mentioned simultaneous causation and effectuation logics are observed empirically on several occasions.



Fig.1.6. Dynamic model of causation and effectuation

1.3.Conformity Analysis

1.3.1. Introduction:

In the literature 'Governing smart city' by **Meijer and Bolivar [10]**, uncovers three foci namely 1. technology, 2. Human capital and 3. Collaborative Governance

1.Technology focus = strengthening of the urban system using technology

2.human Capital focus = focus on metropolitan areas with large share of adults with higher education, higher education institutions as the driver for smart urban development.

3.Collaborative governance = Interaction between different stakeholders: productive interactions between networks of urban actors.

This literature has proposed:

- **Investment in social and traditional infrastructures** drive sustainable economic growth and achieve a high quality of life
- Driven by wise management of resources through **participatory governance**.

Why measure dimension?

From the two literature, I would reinstate two factors necessary for the success of a smart city initiative, i.e. Sustainability and socio-economic value. In other words, innovation either in the product, process or service is designed to improve/optimise traditional process, product and services which ultimately depends on the adopter's willingness and capacity to accept systematically the new practises emerging from such

innovation without failing to add value to the adopters. Its thereby evident to state people are the ultimate drivers of smart city development.

Measuring innovation dimensions against

- 1. Social and environmental sustainability
- 2. Technology focus
- 3. Human capital
- 4. Collaborative governance

1.3.2. Conformity Analysis:

Citizenship participation is stimulated by new practises in **technology dimension** which conforms with **collaborative dimension** where new practises emerge as a result of 'Ba' and Co-creation strategies. In technology dimension, the focus should not only be to strengthen the urban systems but also the social participation systems which ultimately is responsible for people engagement.

Highly sectorial and **organisationally fragmented urban city can be solved through consolidation approach** like the open data platform like cloud data sharing which has enabled to speed up the innovation by networking and connecting the missing bricks. > **Technology dimension** needs to conform with the **collaborative dimension**. [Hartley, J., 2005. Innovation in governance and public services: past and present. Public Money Manage. 25 (1), 27–34.]

Organisational dimension from a smart city perspective correspond to the indicators like efficiency, productivity, and quality of daily operations like in municipal body. These are empirically realised through process innovation, strategic innovation and governance innovation. Organisational dimension of innovation is often project-based and leads to incremental end of the innovation scale. Projects like these sustain for a short time frame and hence is the limitation of this type of innovation. *Does not conform with the sustainable objective yet effective for short term goals.*

Collaborative Dimension needs to conform with open and Experimental dimension Nilssen et al [4].

Table 2: Conformity Test

Technology = Collaborative	Public engagement exists. Technology stimulate public participation	Changing external schemas and scripts
	Consolidation approach is followed. Suitable for highly fragmented urban city	
Organisational dimension	Realisation of productivity, efficiency accelerated by process innovation, governance, and strategic innovation. Suitable for a short horizon planning, not a sustainable goal.	Changing Internal scripts and schemas
Experimental Dimension = organisational	There is more interaction among the stakeholders. Collaboration with more productive urban actors. Knowledge exchange is suitably transparent.	Learning new schemas and scripts

1.4. Corporate entrepreneur continuum:

Entrepreneurship are defined as the agents of economic growth by prominent economists, which are likely to facilitate innovation in either of process, product or services reducing or eliminating existing process, products, and services -"creative destruction". Innovation typically refers to improvement in product, process or services that increase the utility. Thereby, gaining the interests of adopters which leads to economic activity. For example, a study on role of entrepreneurship in corporate strategy at Intel Corporations suggested that entrepreneurial behaviour was the result of multi-level interactions between individuals and groups at different hierarchical levels. Hence, even a large corporation management with long planning horizon are role playing entrepreneurship, implying proactiveness and innovativeness.

Corporate entrepreneurship is a behavioural phenomenon

Depending on the environment stable vs turbulent, innovation speed and resource productivity, entrepreneurial behaviour ranges in the entrepreneurial continuum as

- 1. Conservative
- 2. Entrepreneurial

The position of a firm on this range is referred to as entrepreneurial intensity. A firm with high entrepreneurial intensity tends to be more innovative, proactive and risk taking. Such an approach is very much consistent with the turbulent environment. while a conservator firm open operate under stable environment and thereby allowing them to focus on only productivity and efficiency rather than on innovativeness and risk taking.

Entrepreneurial Approaches:

- 1. External Approach: Intensive scanning regime + Short planning Horizon + Flexible planning system = to face high velocity environment/ turbulent environment + competitive threats + Uncertainty
- Internal Approach: Deep Locus of Planning + high degree of emphasis on strategic controls + medium financial control s = opportunity recognition + New idea generation + employee participation

If we look at the approach, it is governed by six selective strategic dimensions that contribute to entrepreneurial intensity. In this literature, we elaborate each strategic dimension and explains its relation to effective organisational management. These management principles emphasise firm's ability to measure, encourage and reward innovative and risk-taking behaviour in a turbulence vs stable environment. These strategic dimensions can be used to evaluate contextual strategies over the course of the thesis to justify and identify modern business strategies.

Scanning Intensity: Refers to the managerial capability to understands trends and patterns in the organisation's environment. The higher the level of scanning in the relevant environment leads to becoming more responsive to market reaction, otherwise called opportunity recognition. Information collection and analysis are critical to developing and maintaining of innovative strategies in a high velocity environment. Hence, an intensive scanning regime in a turbulent environment



Fig 1.7. 2019- Innovation trend



Fig.1.8. ICT Growth over time

The technologies like mobile, cloud systems, AI, sensors and analytics altogether have had combinatorial effects on the accelerated progress in the mass-market, allowing critical decisions to be taken to the earliest before negative impacts. Digital transformations are expanding industry creating new value and scope for entering the global market. The scanning tool are consistently and rapidly aiding the business potential to thrive complex environment.

http://reports.weforum.org/digital-transformation/onward-and-upward-thetransformative-power-of-technology/

Planning flexibility: (Flexibility and aggressiveness)

Refers to the firm's capacity to change decisions timely, adapting to the environment threats and opportunity as they emerge. A firm can change strategic plans with respect to market changes is from the fact they recognise it and arrange a predisposed flexibility in the strategic plan itself. The flexible strategic plan taken must be consistent with the organisational structure without diminishing its overall objective, i.e., fulfil a certain level of uncertainties in the form of scenario-based action plans.

In China, the e-commerce industry witnessed a shift in user profiles, expanding the range of user profiles upward to seniors' citizens, implying the potential buyers of market, indicating higher demand shift in online market. The digital solution served as a replacement to traditional brick and mortar business without affecting the objective. Not only, businesses shifted, also the stimulated the digital immigrants to adopt to their daily lifestyle. The value created as a result of quick digital solution adoption can be attributed to the Planning flexibility of many such B2B and B2C businesses. In fact, the External Approach: **Intensive scanning regime + Short planning Horizon + Flexible planning system** is highly related to this scenario.



Fig.1.9. E-commerce user profiles before and during covid-19 crisis.

Planning horizon: (Speed, adaptability)

It refers to the length of the future time considered while planning. In Other words, what is the length of the time to execute performs routine strategy. The rational is that it should long enough to allow flexibility in strategical changes when needed yet be short enough to develop a comprehensive plan. Optimal planning horizon for entrepreneurs is less than 5 years. In a turbulent environment, A competent to advantage can sustain only within a specified time framework. Hence a short planning horizon for product development and service life cycle is needed in a dynamic environment. Hence intensive scanning combined with short planning horizon gives an entrepreneur the ability to recognise environmental changes and quickly develop appropriate developments.

Source: https://hbr.org/1965/11/exploit-the-product-life-cycle

A hypothetical Product life Cycle based on history of Nylon business

The case study shows, an incremental innovation of a product or service, deceivingly leading to the conclusion of reaching the matured stage and a flat curve but systematically extending the life cycle. Such innovation calibrates between necessity and future demand in the early stage, which eventually becomes a necessity. With this said, incremental innovation is driven by careful understanding of changing environment like technology, competition, and trends. In the case of Apply iPhone, every year they launch new models in different price range, while most of the innovation is at hardware level, allowing to extend its iOS services. This suggests Apples strategic short horizon planning in various areas like product development, sales, and services.

Locus of planning: (innovativeness)

Refers to the level of employee involvement in the firm's strategic planning activities, i.e., a shallow or deep locus of planning. Deep locus of planning is more participative while a shallow locus of planning happens only at the main management level. It is believed that high locus of planning drives corporate entrepreneurship intensity. Its observed in such planning phase, employees are closest to the customer, allowing them to recognise opportunity quickly, which is critical to entrepreneurial process. A strategic can be validated with the diversity of viewpoints because of multi-level participation in an organisation. It could avoid the risk of bounded rationality because of management team homogeneity, like in the case of Kodak, where they over invested on R&D for digital camera, earlier before the next paradigm owing to no conflicts at management decisions. As no conflict means no innovation.

Control attributes:

Control attributes ensures strategies meet predetermined goals and objectives. From entrepreneurial context, it means ensuring proactiveness, innovative and risk-taking. Financial controls rely on objective financial indicators like net income, return on equity and return on sales. While strategic controls rely on indicators such as customer satisfaction, meeting product development deadlines, quality control standards and more. Two forms of controls systems are Strategic control and Financial control. Both control system exists in almost all firms in general, yet one of each is emphasised more in certain firms.

A) Strategic controls: Strategic control should be consistent with entrepreneurial controls that reward creativity and innovation. Without the controls, time-lags intervene in the execution and consecutively impact pay-off. In a conservative firm, such strategic controls are less emphasised as there is no need to innovative frequently and establishing such control system involves costs, interfering their cost control strategies, which is in fact a financial control attribute. Hence, strategic controls are more consistent with entrepreneurial processes.

B) Financial Control:

Financial controls are relied by most conservative firms with distinctive competencies. Financial control respect international standards with a high degree of discipline, trusted and agreed by financial experts. These factors are likely to favour conservative firms which operate under less innovative environment and highly stable conditions, possibly not encouraging entrepreneurial goals

Chapter 2: Understanding of various Smart City Typologies

2.1. Introduction: Smart city classification based on technological approaches and its strategic fit with market-driven approach

Smart city domains are increasingly discussed from scientific, political, and economic point of view. The fact that various parties have different perspectives and strategic deviation, it is quite unclear about smart city evolution in different place. Scientific documentations refer this phenomenon of technological smart city evolution as a "**measurement system for intelligence**". More often described as "application box" for information technologies. Over a decade, these approaches realised many changes, evolved to other forms, or sometimes even declined. In this chapter we intend to seek what smart city approaches existed or have existed and how it fits the market-driven approaches. Each smart city approach is characterised by e-services and grouping of these e-services help to identify evolution roadmaps. These e-service groups are used for technological road mapping, which serves as a tool for strategic decisions. Different forms of ICT solution exist, and experts classify them into two market-driven groups: based on size (large scale to small scale) as "**Greenfields**" and "**Brownfields**". Moreover, four different types of projects based on organisation and business model in the table 3.

Project box	Description
IT box	Privately funded business model prevails over smart city
	development
Dream Box	Public-private partnership business model and projects prevail.
Fragmented	Projects may be initiated by various stakeholders reflecting little
Box	or no integration.
Black Box	Government creates ecosystem, allowing invited parties to enter
	the system.

Table 3: Project Box Types

The above study would allow us to understand the nature of smart city, helps to evaluate the short- & long-term goals, evaluate alignment with local & national policies and identify the nature of environment in different cities.

Many cities approach the famously iterated term smart city. Many factors differentiate various smart city approaches. It is the internal challenges that lead them to prioritize different alternative objectives that they thought was feasible to overcome the challenges or create an environment that builds a favourable environment that will accommodate parts of determined roadmap later. A phenomenon of these projects is that they change directions and objectives more than once, questioning the viability of prospective project. Since different ICT system tend to describe the same phenomenon,

to relieve from the confusion, we need to make a case to extract the similarities and differences.

2.2. Background

Based on the on smart city classification and road mapping journals, 8 different smart city approaches were identified alongside 31 relevant city case studies, which evolved since last decade through overcoming several challenges. Firstly, **Web or Virtual city** takes the form of web environments offering local information, exchange of text information, virtual meeting solutions and virtual city simulation.

Secondly, **the knowledge city** adopted in Copenhagen and Edinburgh (ex-industrial area), which developed a public database with crowd sourcing options, enabling supply and demand of local information with the support of knowledgeable citizens and through collaboration to deal with local problems such as unemployment.

Thirdly, **Digital cities**. City of Seoul approached Broadband city/ Metropolis, installing fibre optic backbone infrastructure across cities and enable the inter-connection between households and local commercial networks. Fibre optic backbone with ultra-high-speed networks together offer a progressive environment for telecommunication vendors and other private investments possibilities. Examples of cities that collaborated and inter-connected their broadband network are Beijing (China), Antwerp (Belgium), Helsinki, Amsterdam, and Geneva (Swiss). The environment offered free of charge connection to these broad-band network gaining 50% of end-users support, while charges were applicable only on businesses. Arrangement for establishing sub-networks for business resulted through the willing of local enterprises to participate in the network by connecting to their facilities. *Despite the efforts, project discontinued in 2005 and restarted in 2008 with a firm objective and strong budget allocation*. Digital city offers the mesh metropolitan environment connecting virtual and physical spaces to tackle with locally borne challenges. Hence, digital city offers ICT- environment that concerns:

- 3. Boost local transaction and fulfil needs.
- 4. Enable societal transformation
- 5. Official and unofficial information collection

Dubai offers the model of "**Media city**" and "**Internet City**" with broadband and media infrastructure that support the commercial centre and enterprises. Several other cities in Europe look at the intelligence dimensions to which ICT can contribute.

Forth, comes the **Ubiquitous city** (u-city) characterised by minimization of broadband costs and commercialization of wide range of information systems such as cloud

service, IoT systems and peer-2-peer connections allowing information accessible anytime and from anywhere via ubiquitous ICT.

Finally, the **Eco-city or Green City** capitalization of ICT for sustainable growth and for eco-friendliness prevails. ICT play crucial role in measuring, monitoring and maintenance of environment and energy optimisation; smart grids implementation and renewable energy production are some examples of the eco-city services.

Approach	City	Current condition
Virtual City	American-on-line cities (AOL)	Digital cities
_	Kyoto, Japan	Digital city
	Bristol, U.K	Digital City
	Amsterdam	>Broadband, eco-city
Knowledge Bases	Copenhagen, Denmark	Industrial>Eco city
	Craigmillar, Scotland	Community Portal
	Blacksburg, Australia	Knowledge city>Digital
		city
Broadband City /	Seoul, S.Korea	
Broadband	Beijing, China	
Metropolis	Helsinki	
	Geneva	
Wireless / Mobile /	Newyork	
Virtual City	Kista, Stockhilm	
	Florence, Italy	
Smart City	Antwerp	Broadband city
	Taipei	Eco city
	Tianjin	Eco city
	Barcelona	Exist as smart city
	Brisbane	Exist as smart city
	Malta	Connects ICT in
		healthcare and
	Dubai	education
		Integrates top ICT
		solutions
Digital City	Hull, U.K	Focused on e-gov, e-
	Cape Town, South Africa	learning
	Trikala, Greece	E-services for tourism,
	Austin, U.S.A	transport
	Portugal	Exist the same
		Exist and emerges as
		eco-city
		Knowledge based city

Table 4: The classification and status of various smart cities

Ubiquitous City	New Sondgo, S.Korea	Under development and
		Evolves to Eco-city
	Dongtan, S.Korea	Evolves to Eco city
	Osaka, Japan	Under development
	Manhatta Harbour, U.S.A	Under development
	Masdar, UAE	Under development
Eco-city	Dongtan, S.Korea	Evolves to Eco City
	Tianjin, Singapore	Under development
	Masdar, UAE	Under development

The Table displays Seven market driven E-service groups and the how many of those services were adopted by smart cities overtime. These service groups are recognised in smart city domain such as City Administration, Education, Healthcare, Public Safety, Real Estate, Transportation, Utilities.

- *E-Government services (City Administration market-driven group)* concerns public interaction and engagement regarding complaints, administrative procedures at local and at national level, job search supports and public procurement (they are faced in Digital, Smart and Ubiquitous approaches).
- *E-democracy services (City Administration market-driven group)* Issues of common interest are introspected for consultation, polling and voting the concerned area (offered by **Virtual, Digital, Smart and Ubiquitous approaches).**
- *E-Business services (Real estate market-driven group)* mainly support business installation, while they enable digital marketplaces and tourist guides (met in **Digital and Smart city approaches**).
- *E-health and tele-care services (Healthcare market-driven group)* offer distant support to groups of citizens such as the elderly, civilians with diseases etc. (appear in Digital and Smart city approaches).
- *E-Security services (Public Safety market-driven group)* support public safety via amber-alert notifications, school monitoring, natural hazard management etc. (only available in Ubiquitous approaches).
- Environmental services (Utilities market-driven group) contain public information about recycling, while they support households and enterprises in waste/energy/water management. Moreover, they deliver data to the State for monitoring and for decision making on environmental conditions such as for microclimate, pollution, noise, traffic etc. (met in Ubiquitous and Eco-city approaches).
- *Intelligent Transportation (Transportation market-driven group)* supports the improvement of the quality of life in the city, while it offers tools for traffic

monitoring, measurement, and optimization (delivered in Digital and Smart city approaches).

- Communication services (Real estate market-driven group) such as broadband connectivity, digital TV etc. (offered by Broadband, Mobile, Digital, Smart and Ubiquitous approaches).
- *E-learning and e-education services (Education market-driven group*, available in Smart and Digital city approaches).

Table 5: E-services that are being offered by smart cities and market-driven project assignment:

Case	Started	e-Services	Market-driven
AOL Cities	1997	Online City Guides, Information from local enterprises	BrownField, IT Box
Digital City of	1996	GIS information about the city, City Guide, Municipal Transportation,	BrownField, IT
Kyoto		Crowd Sourcing, 3D Virtual Tour	Box
Prictol	1007	Advertising spaces, Connection with citizens personal sites, Public	GreenField,
DIISCOI	1557	information	Dreambox Box
Amsterdam	1997	Energy Management, Smart Building, Tele-presence Conference	GreenField,
		Centers, Grid energy solutions, Sustainable Public Spaces, Sustainable	Fragmented Box
		Working	
Copenhagen	1989	Local e-Government Services, National e-Government Services, City	GreenField,
		Guide, e-parking services, Guides for entrepreneurship	Fragmented Box
Craigmillar	1994	Self-recycle Services, Local online news, Job opportunities in the city,	BrownField, IT
		Marketplace for cars and property	Box
Blacksburg	2001	GIS services, Crowd sourcing, MAN, 3D Virtual City model with crowd	BrownField, IT
		sourcing options, Broadband services, Online guides and training for	Box
		entrepreneurs	
Seoul	1997	Wired and Wireless broadband internet services, Digital Mobile TV	GreenField,
			Dream Box
Beijing	1999	Wired and Wireless Broadband Services, Smart Olympic Buildings	GreenField,
			Fragmented Box
Holcinki	1005	Regional Man Service, WIAN bot spots, a boalth cards	GreenField,
HEISITIKI	1995	Regional Wap Service, WEAN hot spots, e-hearth cards	Dream Box
Geneva	1994	Wired and Wireless Broadband Services, Public Information and public	GreenField,
		service guides, Tourist Guides, Job Opportunities, (<u>http://www.ville-</u>	Dream Box
		<u>geneve.ch</u>)	
Antwerp	1995	e-Government services (e-Counter), Online Tourist Guide, e-Booking	GreenField,
		Property Database, environmental information and guides for	Fragmented Box
		entrepreneurs	
New York	2004	Wireless broadband services, e-Government portal (www.nyc.gov),	BrownField, IT
		GIS city information (http://gis.nyc.gov/doitt/nycitymap/)	Box
Stockholm (Kista)	2002	residential parking permits, e-government services, elderly care	GreenField,
	2002	treatment	Fragmented Box
Tainai	2004	Intelligent transportation, e-parking, 3D website for virtual tours,	GreenField,
raiper	2004	public e-services, E-Future Classroom	Fragmented Box

Case	Started	e-Services	Market-driven
Dearten	2005	Eco services like smart grids, energy/water/waste smart management,	GreenField,
Dongtan	2005	green buildings	Fragmented Box
Tioniin	2007	Eco services like smart grids, energy, water and waste smart	GreenField,
nanjin	2007	management, green buildings	Fragmented Box
Barcelona	2000	e-Government services, mobile services, Online city guide, guides for	GreenField,
		entrepreneurs (https://w30.bcn.cat), Intelligent transportation, Open	Fragmented Box
		data from city Council	_
Hull	2000	e-Government information and e-services, GIS maps	GreenField,
			Fragmented Box
Trikala	2003	Tele-care services, Intelligent Transportation, Wireless broadband	BrownField,
		services	Black Box
Brisbane	2004	e-parking, e-Government services, mobile services, e-procurement	BrownField,
		services via national portal, virtual communities	Fragmented Box
Malta	2007	Smart grids	BrownField,
			Fragmented Box
Dubai	1000	Madia services, a Education, a commerce, Develops business services	BrownField,
Dubai	1999	wedia services, e-Education, e-commerce, Develops business services	Black Box
New Songdo	2008	Intelligent Buildings, Ubiquitous computing, Local information	GreenField,
		(http://www.songdo.com)	Dream Box
Osaka	2008	Tourist guides, Public information(<u>http://www.city.osaka.lg.jp</u>),	GreenField,
		Guides for entrepreneurs (<u>http://www.investosaka.jp</u>)	Dream Box
Manhattan	2010	Intelligent Buildings, Ubiquitous computing	GreenField,
Harbour, Kentucky	2010	Intelligent Buildings, Obiquitous computing	Fragmented Box
Masdar	2008	Panawahla recources and smart energy management	GreenField,
Iviasual	2008	Nenewable resources and smart energy management	Dream Box
Cape Town	2000	Environmental services, tourist guides, intelligent transportation	GreenField,
			Dream Box
Knowledge based	1998	Broadband and telecommunications services, Online city guides,	BrownField, IT
cities		Public information	Box

IT Box: 6 cases / Dream box: 7 cases / Black box: 2 cases / Fragmented box: 12 cases

2.3 Visualization of Smart City Evolution:

The figure below shows how Smart city took various forms over a decade and ongoing. Various alternative appraoches can be seen adopted by each city and are those concerned with large scale projects (Greenfield), owing to its size, scope and objectives renewed overtime. Alos, Fragmented Box is mostly prefered as you can see various projects by different stakeholders tend to create the alternative approach to smart city. PPP projects prevail (Dream box) in less number of cities compartive to the total cases observed in the research, 2013.

(Figure) illustrates that (a) knowledge bases created updated to digital cities. (b) Next in timelines, the Broadband cities evolved to smart cities. (c) A relative evolution path is followed by the wireless cities. (d) Mostly prevailing appraoches of today are the digital, smart, ubiquitous, eco-cities and web cities. Moreover, the evolution path of each alternative approach can be seen. For instance, digital cities appeared in 1994, they are still active and today, they account twelve of the examined cases.



Fig.2.1. Smart City Evolution

Based on the path-dependent changes, here we can explain the smart city evolution based on e-service groups, while two or more cases can be observed to fall on one or more of the e-service groups, it still explains the similar contextual conditions/events that existed previously and the resultant new environment. Moreover, the e-service groups reflects already the market needs.

Service Group	e-Services	Year	Freq.	Cases
SGroup1	e-business, city guides, urban virtualization	1989	6	AOL cities, Bristol, Copenhagen Base, Craigmillar, Osaka, Blacksburg, Amsterdam
SGroup2	E-Government, e- Democracy, e-learning	1994	9	Bristol, e-Trikala, Antwerp, Stockholm (Kista), Taipei, Barcelona, Hull, Brisbane, New York
SGroup3	Broadband communications services	1994	14	Craigmillar, Blacksburg, Seoul, Beijing, Helsinki, New York, e-Trikala, Dubai, New Songdo, Knowledge based cities, Geneva, Barcelona, Amsterdam, Cape Town
SGroup4	E-health and tele-care services, e-security	1995	3	Helsinki, e-Trikala, Stockholm (Kista)
SGroup5	Intelligent Transportation, e-parking	2002	6	Stockholm (Kista), Taipei, e-Trikala, Brisbane, Amsterdam, Cape Town
SGroup6	Ubiquitous services, communications services	2008	4	Osaka, New Songdo, Masdar, Manhattan Harbour
SGroup7	Eco-services, smart grids, waste/recycle management	2005	7	Amsterdam, Craigmillar, Malta, Masdar, Tianjin, Dongtan, Cape Town

Table 6: Similar business conditions in terms of e-Service groups

2.4. Smart city cases based on Project type:

Resource intensive projects are characterised **Greenfield + Dream box** projects as they are scalable and long-term, allowing to monitor and control signifying learning economy involved. While resources constraints give rise to **Brownfield + IT/Blackbox** suggesting revenue generation motive in short horizon. **Fragmented projects** are consolidating and are approaching to co-creation, collaborative black box, and dream box approach.

Project box	Description
IT box	Privately funded business model prevails over smart city
	development
Dream Box	Public-private partnership business model and projects prevail.
Fragmented	Projects may be initiated by various stakeholders reflecting little
Box	or no integration.
Black Box	Government creates ecosystem, allowing invited parties to enter
	the system.

Greenfield + Dream box Projects	: Long-term and scalable projects operated in
Private-Public Partnership model.	(Resource intensive)

Cities	Services	Year
Bristol	Connection with citizens personal sites, Public	1997
	information, Advertising spaces	
Seoul	Digital Mobile TV, Wired, and Wireless broadband	1997
	internet services	
Helsinki	Regional Map Service, WLAN hot spots, e-health cards	1995
Geneva	Public Information and public service guides, Tourist	1994
	Guides, Job Opportunities, Wired and Wireless	
	Broadband Services	
New Songdo	Intelligent Buildings, Local information, Ubiquitous	2008
	computing	
Osaka	Public information, Guides for entrepreneurs, Tourist	2008
	guides	
Masdar	Renewable resources and smart energy management	2008
Cape Town	Environmental services, intelligent transportation,	2000
	tourist guides.	

Brownfield + IT box: (Privately financed)

Brownfield projects are generally defined as smaller sized projects, short-term horizon oriented and fast implemented, usually built on existing infrastructure, and are preferred by investors for accelerating revenue generation. (Social infrastructure focused)

Cities	Services	Year
AOL cities	Online City Guides, Information from local	1997
	enterprises	
Digital City of Kyoto	GIS information about the city, City Guide, Municipal	1996
	Transportation, Crowd Sourcing, 3D Virtual Tour	
Craigmillar	Self-recycle Services, Local online news, Job	1994
	opportunities in the city, Marketplace for cars and	
	property	
Blacksburg	GIS services, Crowd sourcing, MAN, 3D Virtual City	2001
	model with crowd sourcing options, Broadband	
	services, Online guides and training for entrepreneurs	
New York	Wireless broadband services, e-Government portal	2004
	(www.nyc.gov), GIS city information	
Knowledge based cities	Broadband and telecommunications services, Online	1998
	city guides, Public information	

Brownfield + Black Box: (Government creates ecosystem, allowing invited parties to enter the system.) (Soft infrastructure focused)

Cities	Services	Year
Trikala	Tele-care services, Intelligent Transportation,	2003
	Wireless broadband services	
Dubai	Media services, e-Education, e-commerce, Develops	1991
	business services	

2.5 Six Characteristics of Smart city and its association with Entrepreneurship:

The Smart city is a combinatorial effect of various approaches of spatial planning, economic geography, knowledge economy, urban technology, and marketing. Its interdisciplinary nature of study and activities constitutes individual elements and their interdependencies that contribute to smart city developments such as Human resources and Quality of life. They are not only the essence of smart city, but they also determine the innovativeness and economic sustainability of a smart city across various domains. Innovativeness together with strength of social capital will increase the attractiveness for entrepreneurial activity in the Smart city. While Smart city are more of entrepreneurial nature, there is a research gap between entrepreneurship and Smart city. Research studies indicate six characteristics of Smart city which is analysed regarding their contribution to the entrepreneurial activity.



Fig.2.2. Six Smart City characteristics

1. Quality of ICT Infrastructure and Usage: High or Low

Broadband Networks – Support digital application

ICT should improve the operational efficiencies of government and economy as well comprising of social, cultural, and urban growth sustainably. ICT infrastructures comprises mobile and landline phones, internet services whose contributions include e-services such as e-governance, e-commerce, lifestyle, housing, and leisure. Additional infrastructures include Smart grids, smart meters, energy management applications, traffic management systems, navigation systems, waste management systems and more. ICT lays the foundation upon which a sustainable city will be built. Sustainability refers to reliability and eco-friendliness. If the value proposition of either government or private entity uses the ICT, sustainability can be ensuring in the form of monitoring, measuring, and rectifying. The way these exchange of information works is through data processing. Two primary information sources exist within an ICT infrastructure. One is the information flows from city's actors (inhabitants) in the form of social media or crowd sourcing. *Higher the ICT quality and availability, the better the data driven Smart city development, growth, and prosperity*.

2. Business-led urban development:

A city characterised by a governance model from a managerial to an entrepreneurial focus, witness influence of corporations of various sizes. They are the source of private
capital flow into the city and hence urban growth. A city government offering advantageous conditions attract inflow of companies ranging from small -medium sized enterprises and large corporations. Hence to make sure the sustainability of businesses, government should create conditions for constant private capital inflow through business-led urbanisation. Conditions as such may involve providing accessibility to data (open data), brownfield projects (IT Box or Dream box or Black box), living labs and University incubations. Overall, a smart should or which offers such conditions function as seedbeds for creativity, innovation and entrepreneurship.

3. Role of high-tech and creative industries and Social inclusions:

Provided a given sufficient hard ICT infrastructure and urban developments, the soft infrastructure elements such as knowledge networks, presence of creative class (skilled work force) accounts for Smart and sustainable economic growth. They focus on human and social dimensions more despite hard infrastructures. While ICT provides a platform that enables exchange of information and form closer relationship irrespective of distance and time, the rapidity of information exchange, creation of tacit knowledge, knowledge transfer together offers *Geographical knowledge spillover effects*. Unlike codified knowledge, tacit knowledge is the result of observation, interactive participation, and practice. *Hence, choosing Smart city having the potential of tacit knowledge and transfers is highly valuable*.

4. Role of Social and Relational Capital

Smart City Community must learn, adapt, and innovate continuously. To be able to do this, government, citizens, and economies should be able to use ICT to achieve a benefit out of its implementation. If there is no interaction or usage of ICT or in technical terms if social and relational capital is ignored, social polarisations could become a barrier to Smart initiatives to progress. Learning process involves information exchange among urban actors within network and hence relational capital is strengthened, a key component for smart city contribution.

5. Social and environmental sustainability

An important long-term aspect of Smart city conception is to know how scarce resources are managed and what sustainable model can be used to manage them. Moreover, high concentrations of public consumptions and wastes increasingly alert the cautious and renewable use of natural resources, and reduced disposal of nonrenewables. Sustainable solutions to protect this dimension of Smart city is still considered a challenge. Yet, there are improvements that promote environment sustainability like traffic management applications, mobility services that ease the traffic problems contributing to sustainable goals. Reducing and replacing traditional inefficient system with efficient problem-solving and improving systems guarantee sustainability gradually. Hence, strategies that create physical-digital environment, actualise useful applications.

S.No	Smart city Characteristics	Entrepreneurial Opportunities		
1	High ICT quality and Usage	 Creative Industry cluster Digital Media Resources and applications Data Curation/ Processing Needs Big Data Cloud based services Availability of Open data SME opportunities in [Sensor technology, P2P Business, Grid technology. 		
2	Business-led Urban Development	 Socio-technical networking Urban Clusters of industries, university, and community. Knowledge spillover effects Tacit knowledge abundance 		
3	Social Inclusions approach	 E-services and Applications Short term projects Public-Private-People Partnerships Local Patriotism increase stickiness of talent pool. 		
4	High-tech & Creative industry	 Provide Living labs or incubators Triple-Helix models exist (University- Industry-Government relationships) Co-creation, exploration, experimentation, and evaluation opportunities (piloting, researching) 		
5.	Social and Environmental Sustainability	 Green Promotion activities/ Green movements Eco-friendly markets are less explored Green Projects (PPP projects) Green Tax incentives green vehicles, green buildings, material waste management, renewable energy equipment, 		

Table 7: Entrepreneurial opportunities corresponding to Smart city characteristics

Characteristics of the E-venture		Characteristics of the born global	Connection	
Orga- niza- tion and inter- nal pro- cesses		Company's resources	The Internet offers new ventures an important opportunity to internationalize and compete with the large multinationals since it is not essential to have infrastructures and other costly investments to operate abroad –e.g., ease of communications, ease of identifying and developing new markets, lower transaction costs.	
		World wide markets	The e-firm expands its competitive scope by using Internet to access electronic world markets.	
		Knowledge of the specificities of the lo- cal markets	Internet makes it possible to access relevant information about local markets -e.g., regulations, distribution companies, sociocultural characteristics of the local popula- tion, etc, to undertake on-line surveys and to identify new markets by means of the profiles and patterns of access of Internet users in different countries.	
		International partners	A reduction of the negative impact of the geographical distance between partners on business coordination and negotiation.	
	Use of the Internet		Removes many barriers for international commerce, such as imperfect information between suppliers, as well as between the company and other partners.	
	and other forms of communication aided by the development of ICT	Coordination between the company and its subsidiaries, and be- tween subsidiaries	The Internet reduces the time required exchange information and improves the efficiency of the mechanisms of coordination in business activities in geographically distant locations.	
		Operating costs	Because it is possible to manage and coordinate international business via the Internet, it is not necessary to install physical logistics for production and sales; consequently, the operating costs decrease and international expansion becomes more rapid.	
		International advertis- ing costs	The Internet constitutes a means with extensive, low cost coverage to promote the company's products and services and also makes it possible to implement promotion campaigns adapted to the different customer profiles in terms of both content and the virtual spaces through which the promotion is undertaken –i.e., personalized e-mails, company website, forums and chats aimed at the target market, on-line news, electronic bulletins, advertising on search engines, etc.	
		Control of overseas operations	The Internet enables companies to directly manage the relationship with the cus- tomer, thus reducing the need for intermediaries. By means of Internet, the firm can give the customer the required information about the product, the prices and order management in an accurate, timely and easily available fashion.	
	Intangible character of the activity	Cost of transport, cus- toms tariffs	The geographical distance to the foreign markets does not hinder the international distribution of the products/services offered by e-ventures, as opposed to the high impact that geographical distance can have in other sectors.	
	High R&D costs	International scope and scale of target market	Importance of attaining a minimum efficient size that permits the amortization of the high costs of R&D undertaken by these companies.	

Table 8: Characteristics of E-ventures in Smart Cities (Global approach)

The table is directive of how ICT can be potentially adopted into the various organisation processes in an E- Venture to substitute the diseconomies of conventional methods and adopt digital approach. This approach can be suitable adopted in the future works of the entrepreneurial model.

Chapter 3

3.1 Introduction:

3.1.1. Business Models Adopted in Smart city:

The importance of business model in a smart city is create, deliver, and receive organization value. This value is believed to be derived from appropriate processes.

The authors exemplify a barrier in smart city programs in the form of high investment requirements and high risk. Also, capability checks as a necessary management skill. Not the least, stressing the importance of an effective new instrument for investing.

Smart city as we realize as much widely spoke, initiatives taken across many cities in the world. Now, it's time to dig deeper and find more answers about the events. It's believed that by 2025, smart city niche market is estimated to touch a gross of \$3 trillion attributed to operational efficiency and new entrepreneur.

Experts suggest this source of money is attributed to embedded operation efficiency and entrepreneurship. Although role of government and other enablers provide the support for new entrants, entry level behaviour is characterized by standardizations and business models. While the topic of the town is about gaining dynamic capability to keep in pace with the evolving society. Hence entrants who strategize on capitalizing on other attributes of their innovation and staying in market seems to be an appropriate choice.

Hence, smart city solutions and its corresponding business model must be analysed to understand to what extent existing model is used, what are the new business models evolved over time and any other innovative models that creates value. Scholars believe smart city solution is integrating ICT with urban spaces and provide solutions that enhance the local intelligence and city dimensions 9 people, economy, environment, mobility, living and governance), not the least, sustainability, efficiency, and safety as commercial expectations.

More engagement from government in driving smart city initiatives, than individual interests suggest unwillingness to risk and unfavourable environment. Government provide financial support for vendors who in turn vest their interest on testing,

improving, and implementing smart solutions. To this end, enhances sustainability, efficiency, and safety aspects. Reluctance of private direct investments corresponds to the city complexities as discussed by authors as multiple parties, stakeholders, and processes [Leonidas et al]. Hence, smart city initiatives are looking at co-creation, emergence, and leadership as factors for operational excellence [Nobuyuki Tokoro].

3.2. Examining Business model patterns:

A deep dive into the components of the business model allows us to acknowledge the key focus areas that is critical to a firm to contextualise their strategies. Parts of these components may be innovated time to time for effectively delivering a value. Innovations around the business model impacts at organisational level and market level. Therefore, radical change of how value is created can divided into three disruptive stages:

- Backstage disruption
- Frontstage disruption
- Profit Formula disruption



Fig 3.1. Business model: a) Backstage, b) Profit formula and c) frontstage

3.2.1. Frontstage Disruption



At the frontstage we **explore the market** indicators like size of the market, attractiveness, look for niche market, untapped areas with large potential for a proposed products and services. The rational here is that market size could either be largely untapped, growing, and unoccupied or there is little untapped potential. A realisation of such opportunity requires an **intensive scanning regime.** Scanning Intensity refers to the managerial capability to understands trends and patterns in the organisation's environment. The higher the level of scanning in the relevant environment leads to becoming more responsive to market reaction, otherwise called opportunity recognition. Information collection and analysis are critical to developing and maintaining of innovative strategies in a high velocity environment.

After exploring the market, it is a question of how do we access it? Access to the market means to reach the products and services to the customers, the larger the customer base, the higher the revenue potential. Innovating the ways with which we reach the target market could capture maximum value. Value proposition together with an innovative channel to access the market segments have combinatorial effects on value acquisition. The rational here is that **limited access** to market could lead a firm to **depend on intermediaries** to get their products and services to reach the market segments. This generates transactional cost and could affect their value appropriation as well. On the other hand, having **their own channel to access** the large-scale market, appropriates more value, for example customer relationship management. A responsive customer relationship management has dual benefits such as validating existing products and services and building trust. Pioneering in innovative channels radically changes how we reach and acquire a large market.

Once a strong channel to access and reach the market segments is accomplished, the next challenges is to **gain stability over the market** and avoid from moving towards the competitive disruption risks. To do it, it is necessary to make it difficult for customers to leave by **increasing the switching costs** in a favourable way. The rational here is that without a switching cost, customers could theoretically leave immediately anytime, while if it is there, customers are locked in for years owing to the direct and indirect switching costs that exists for them if they leave. **Lock in effect** affects market stability, long term position in the market and relationship with transactional industries.

3.2.2. Backstage Disruption



To capture the lion share of the market, it is quintessential that the engine that drives the supply to the market needs to be well designed or adapted to available resources. The engine is the backstage business model and by drive we mean a radical change of how a value is delivered. The engine analogy is used so as to understand how much or what **resources** is used, how **the activity** takes places inside the engine in the best way possible and to know whether **output can be maximised or scaled**. Three areas are focused here on the business model, the resource, activity differentiators and scalers.

A resource characterised by high cost of acquisition (brand), hard to imitate and highly protected (patents, secrets) sets a strong competitive advantage. Resources are tangible and intangible forms and is that resource that are critical to long term success. The rational is that if the resources are not significantly better that competitor, the firm has to set a strategic goal of acquiring it before getting competitively lost, while if they are significantly competitive, they would be sustaining the competition over a definite term.

Activities intended inside an organization can be referred to scalability, operational efficiency, learning efficiency, dynamic competency and more. Based on their strategic character such as cost leaders and differentiators, radically changing which activity they perform and how they combine them impact their value proposition. The rational here is whether we operate on **conventional activities** or **configure activities** contributing to significant competitive advantage that cannot be easily emulated for a definitive period.

A search for scope of the business could lead to insights of expanding the business. To capitalise on such a scope, a scalable business model is required. A scalable business model is characterised by higher output with relatively lower resources and activity bottlenecks. Hence, it is required to know if the business growth is resource intensive or not. The rational here is how rapidly and easily we can grow our business model with respect to resource and activity bottlenecks. While non-scalable activities are resource intensive and are not sustainable. Scalable activities could be in the form of third-party delegations, licensing deals and franchising.

3.2.3. Profit Formula Disruption



A radical change in the way value created are monetized is called profit formula disruption. Based on the level of predictable and recurring revenues and scalability, a firm may have different pricing mechanism. Innovative pricing mechanism could unlock previously unprofitable markets, and/or increase revenues. Provided a revenue sources, a firm may differentiate its revenue/pricing mechanism such as recurring revenue, premium or freemium subscriptions and subsidizing revenue stream.

While revenue differentiators ensure cashflow, cost differentiators use cheaper activities and cheaper assets to deliver benchmark value amongst the competitors. In theory, if all competitors have equal market share, the most benefits are reaped by the ones with game-changing cost structure. Digging into details, cost structure in a labour-intensive firm include labour and time, in resource intensive includes assets management and value chain management.

At the bottom of the model, another aspect of revenue generation is by boosting margins. Higher margins are generated by focusing on what customers are willing to pay for the most, while controlling cost structure. Customers are willing to pay high price for which they value the highest. Focusing on those values and prioritizing profitability over market share will generate higher margins. Again, it is critical to have beneficial cost structure and the products or services to hold higher pricing potential. For this purpose, firstly, try to **reduce constrainers** (reduce high cost, increase value simultaneously). Secondly, introducing products and/or services at the **high end of the market** spectrum will service high-end customers and maximise margin without landing on costly luxury niche.

3.3. Case study illustration of the discussed patterns

Identifying entrepreneurial response actions and classification of response action:

3.3.1. Frontstage Disruption:

3.3.1.1. Market explorers – Innovation driven

New market exploration: Unleashing new needs that are previously unnoticed or expected to become a need in future, through new value proposition. Example: Tesla, iPhone, Nitendo.



Fig.3.2. Visionary model

3.2.1. The case of Tesla motors - Visionaries



Fig.3.3. Tesla motors typical business model

Corporate Actions & Response correlation

- 1. Envision large untapped market: Electric vehicle as a product or a value proposition to high end of the market segment. High end customer segment show willingness to buy, are early adopters of new innovations and are environmentally conscious.
- 2. Breaking down technical barriers: Customer's fear over battery range and rechargeability and charging cost. Tesla recognises in its business models, and has developed long range batteries, free supercharging stations in high traffic areas.
- 3. Externality effects: Word of mouth spreads when the value perceived is higher than expected. Creating positive externality effects through direct distribution channels, gallery-like stores, malls, test drive and owner loyalty programs eventually allows to experience its design and state-of-the-art technology

gaining the aspirations of early adopters (higher perceived value). **Backstage strength:** R&D, technology partners, Entrepreneurial Leadership of Elon Musk.





Fig.3.4. Repurposer Strategy

Corporate Actions & Response correlation

Identifying proven demand: Leveraging upon existing resources i.e., telecom network and users, allowing to recognise usage patterns and demands, has lead Safaricom repurpose its telecom network by creating M-Pesa, a money transfer solution. Safaricom identified service-based value proposition that solved expensive money transaction. Besides, it solved unreliable and expensive cash transfers, worsened by limited ATMs and bank branches.

Differentiate from competition: In mid-2000s, bank services were expensive for small and frequent money transfers. Only a minority of Kenyans were able to use the service, suggested a large number of untapped markets for financial services. With M-Pesa, affordable money transfer was possible, by which value created expanded the market to previously unbanked.

Backstage strength: Telecom infrastructure and data

3.3.2. Channel Kings – Aggressiveness and Flexibility

The ability to reach and acquire customers in innovative ways define the channel kings. Market accessibility depends on possession of strong and direct channels to customer end. This reduces dependency on intermediaries to reach business prospects to customers.



Fig 3.5. Channel Kings

The case of Dollar Shave Club (DSC) – Disintermediator



a) Direct Relationship model

b) DSC business model

Fig.3.6. Disintermediation strategy

Corporate Actions & Response correlation:

Eliminate Middlemen: Reducing middlemen or retailers **saves a large portion of the margin**, contrastingly losing a broad market reach, traditionally enabled by retailers or resellers. Hence DSC cuts out retail stores and aims for direct sales through e-commerce store. The savings on the upside allowed to lower the product price, making it much more **affordable**. Online store quickly disrupted the men's razor blade market.

Differentiated value proposition: DSC adopted a flexible subscription plan to compete on end-to-end customer buying experience. This reduced the inconveniences in the shaving market choices between high-tech and low cost, low productivity tools. With the overall experience, relationship, and data collected, DSC optimises its direct channel.

Brand Recognition: As retail's broad market is eliminated, to reach the mass market DSC uses innovative content marketing (viral videos, educational video) as means to build visibility and brand recognition. DSC used brand's sense of humour in its marketing content that went viral, leaving impressions on the brand.

3.3.3. Gravity creators – Lock in effect

To gain stability over the market and avoid from moving towards the competitive disruption risks. To do it, it is necessary to make it difficult for customers to leave by increasing the switching costs in a favourable way. Lock in effect affects market stability, long term position in the market and relationship with transactional industries.



Fig 3.7 Gravity Creators Strategy

The case of Microsoft Windows:



a) Stickiness scalers





Corporate Actions & Response correlation: *Historical case*

Increase stickiness for B2B & B2C market: The computer market in beginning, was rather fragmented, each manufacturer has their own operating system and customers switched relatively easily from one system to another. The market was characterised by low switching costs for customers. Microsoft created a software/ OS that made relatively easy to operate with built-in features and ability to run compatible programs. As users learning curve increased, it was evident that users were not willing to invest time, cost, and effort to build new programs. On the partners side, Microsoft was successful in pre-installing OS in around 30 manufacturers of computers. They effectively locked in millions of users, who got used to the OS, **Scaling effect**. The market generated recurring revenue for two decades both from consumer market as well as licensor royalties from licensee as they sell.

Multipurpose ecosystem: Lock in effect was driven by the fact that the ecosystem proved to serve multi-purpose work and allowed third party applications to run on the OS. Partly by boosting acquisition of developers of software applications available for windows ecosystem. Hence, PC manufacturers and Software Developers were key partners. Operating system and Licensing agreements were the key resources behind the backend success. Since the launch of windows 3.0, there was steep rise in software development.

3.3.2. Backstage Disruption:

3.3.2.1. Resource Castles



Fig.3.9. Resource Driven Strategy

A resource characterised by high cost of acquisition (brand), hard to imitate and highly protected (patents, secrets) sets a strong competitive advantage. Resources are tangible and intangible forms and is that resource that are critical to long term success. The rational is that if the resources are not significantly better that competitor, the firm must set a strategic goal of acquiring it before getting competitively lost, while if they are significantly competitive, they would be sustaining the competition over a definite term.

The case of Waze: User Base Castling

Waze is developer of traffic navigation system with real-time feedback loop to improve its data driven decisions. The technology allowed to shorten commutation and reduce traffic congestion. The more the number of users, the larger the amount of information from user base.



Fig.3.10. User Base Castling strategy

Corporate Actions & Response correlation:

Instrumentalise Users base: Waze seeks users base -Driver's community and editors, to collect information and improve digital maps. The users generate data such as driving times and GPS data through using their app. The app processes this to display short commuting time and reduce traffic congestion worldwide. The users (driving community) are suppliers of the data. Hence encouraging more users through free app service, allowed more users and consequently more data. Giving them a competitive advantage. The key to this advantage is by instrumentalising user base.

Fully Subsidised Value Proposition: Waze focuses on the commuter's problems such as traffic congestion, long delays and route guidance. This solves millions of drivers' pain globally. This value lead to positive network effects. Effectiveness of the algorithm and free application was critical to contextualise

competitive advantage in terms of user data. Hence, its value proposition was critical to defining the solution.

Aggressive acquisition and improvement: Their strategic choice of offering their app for free allowed to scale user base partially contributed by network effects. The scope for improvement is defined by the users themselves through active usage, traffic update posts. Contribution of every new user allowed the algorithm to become smarter, expanding the value proposition to existing and new users.

The case of DiDi (Ride service app): Platform Castling strategy

Launched in 2012, DiDi launched its ride-hailing service and hold the lion's share of drivers and passengers in the industry. China Urban areas were characterised by exorbitant taxi fares and debates on taxi service quality. Founded as taxi-hailing service, eventually transformed to a ride-hailing service, is now solving the traffic congestion and transportation problem.



Fig.3.11. Platform castling strategy

Corporate Actions & Response correlation:

Connecting two dependent groups: Drivers and passengers are the two dependent customer groups. Channelising the two groups with an appropriate value proposition, bridges the two groups sustainably **(two-sided network effects).** Didi capitalised the opportunity of improving personal mobility by real-time matching of large pool of connected passengers with biggest pool of drivers. Once a taxi-services, later a ride-hailing service, extended to occasional drivers to expand its drivers' resources and cars.

Value proposition for both groups in a platform: Passengers are inclined to use the app as it fulfils their cashless transactions, safety, reduced waiting time, reliability, and consistent pricing. Drivers can find large pool of passengers, with less idle time and route guidance.

Aggressive acquisition: DiDi aggressively acquired its main competitors (Uber China, Kuaidi Dache) to grow its passenger and driver pool. By 2019, they had 31 million drivers and 550 million registered passengers.

The case of Dyson: IP castling strategy

Dyson started as manufacturer of vacuum technology in 1993, currently engineers broad range of products with novel approaches. Their competence in innovation powered by their R&D resources, have allowed to manufacture superior products that serves the high-end market. Their differentiated approach is a strategical fit to their aggressive R&D investments.



a) IP castling strategy

b) Dyson Business model

Fig.3.12. IP Driven Strategy

Corporate Actions & Response correlation:

Envision Advanced Technology:

Investing heavily in R&D, developing an advanced technology protected by patent and selling it a premium tells us more about the competence, capability, and Inspiration of a company. Such an advance tech systems (hard to imitate), make it a monopolistic and premium segment of the market. Dyson, challenges its product engineering with an ingenious approach, producing A-class products and selling it premium. Visionaries build on the foundation of Research and development and through elimination of traditional approaches (Proactiveness).

Create and Capitalise Patent:

Playing the patent card, gives a window period of monetizing the results of R&D. While the ability to develop and patent becomes a capability, capitalising on it is another challenge. Dyson continued to grow its manufacturing of superior product from patent IP. Their seemingly smart buyers or early adopter belong to the high-end market segment, allowing Dyson to reap the monopolistic benefits from its technology. The company spends about 6.5 million per year on patent litigation, with a total of 71 million dollars on about 100 patents.

Establishing premium brand status:

Dyson differentiates its products and services through innovation and high performance. It transformed the home appliance market with cutting edge tech

that is not included in other brands and sleek ergonomic design. They sell home appliances at a premium price, leaving them the most expensive brand of all. Reportedly called as "the apple of home appliances", they strive for perfection before launching any new product.

3.3.2.2. Activity Differentiators:

Activities intended inside an organization can be referred to scalability, operational efficiency, learning efficiency, dynamic competency and more. Based on their strategic character such as cost leaders and differentiators, radically changing which activity they perform and how they combine them impact their value proposition.



Fig.3.13. Activity differentiation strategy

The case of Patagonia: A Sustainability Master:

Patagonia, founded by Yvon Chouinard in 1973, makes clothing and equipment for rock climbers. They sternly believe in eco-friendly initiatives in all their operations. Not the least, their climbing equipment and clothing have little impact on the surroundings. Their sustainable approaches include using renewable energy sources to power its buildings, recycled papers for catalogues and switching to 100% cotton free of chlorine in wool. Their differentiation in key activities and sustainable objectives have made them sustainable masters.



Sustainability driven Strategy b) Patagonia Business model

Fig.3.14. Activity Differentiability- Sustainability Strategy

Corporate Actions & Response correlation:

Sustainability Branding: Patagonia aligns its activities with environmental objectives by making durability a strong constraint in its product design and manufacturing. From the frontstage point of view, the goal is to reduce consumption and waste thereby little impact on the environment. Furthermore, using recycled and organic material it implies reduced toxic waste and greenhouse gas emission. Not the least, comply with strong environmental protection standards throughout its value chain. Right from its resource's management till product management, sustainability on the grounds of environmental concerns is contextualised in the aforesaid management.

Sustainable Value proposition:

When customers buy Patagonia products, they share the value of contributing to the environmental protection. A sense of awareness and satisfaction is instilled among enthusiastic customers. Its value proposition extends beyond the functional value of its equipment and clothing. Not only do they reach the premium market segment, but it has also been successful in reaching the budget buyers, through the second-hand clothing program, which also helps to reduce its environmental footprints.

Premium Pricing:

Since, its sustainability driven operations and resources comes at a cost, Patagonia is forced to apply premium pricing on its products. Customers acknowledge this and show willingness to invest on environmentally friendly products. This defines their buyers are customers who are environmental-conscious.

The case of ZARA: Speed Masters

Since 1980, Zara's disruption in fashion industry is attributed to its radical reconfiguration of its supply chain and its creation of fast fashion category. Zara has become more responsive to the fashion trends by vertically integrating its value chain



Fig.3.15. Speed Masters



Fig.3.16: Activity Speed Driven

Corporate Actions & Response correlation:

Radically reconfigure activities: Its key activities take place at its own facilities at France, allowing it fast design and fast produce, while it takes time for competitors outsourcing from other countries to reach the target markets. This strategic activity placement has enabled it to react with lightning speed to fashion trends. Just-in-time design and production, just-in-time supply chain systems are defining characteristics of Zara.

Innovative cost structure: High flexibility, speed and control of process implies high labour costs. In Zara, 85% of its factory capacity is reserved for in-season adjustments and 50% of its clothes are designed and manufactured during mid-season.

Information Technology integration: Zara uses data intensive sales decisions through effective digitalisation of its resource and sales management processes. In this way, it's able to relay customer's preferences and real-time sales data to designers. Its reduced inventory usage is the result of limited designs and fast production to retail, adjusting to the latest trends.

Time-critical Value proposition: Zara keeps up with the fashion trends by designing and producing limited clothes. Its activity configurations such as just-in-time design and production, just-in-time distribution and logistics allows it to make affordable fast-fashion. Zara produces only few designs in each style, and fast fashionistas knowing that new designs does not last long, they tend to buy it. In this way, inventory storage is scarce. This gives them the upper hand in pricing decision.

The case of Dell: Build to order:

Dell builds personal computer based on customer requirements with high quality and low-cost. Customers get customized machines at an affordable cost. Dell disrupted the PC industry with high quality and low-cost machines, made possible through its build to order approach, minimizing inventory and inventory depreciation cost.



Fig.3.17. Build to order strategy: a) Basic model, b) Dell business model

Corporate Actions & Response correlation:

Decommodification: When PCs came in specific variant and model with different component features, the commoditisation of PC helped non-sophisticated buyers to choose with limited technical knowledge. Customers determined to buy exact specifications, customised their PC components. Dell, took this in its busines model, allowing customers to choose their specification either by call or online. On top of this, cost savings on inventory storage and its depreciation allowed Dell to subsidise on PC price, allowing to sell high quality pc at low-cost. Also, it was able to sell other PC components online.

Just-in-time production and supply-chain: The market for PC components is big and wholesaler provide PC equipment. With the available low-cost outsourcing opportunities, Dell needs to just build upon request of custom order. The cost of build-to-order is low and takes less time to assemble as components are readily available on request. Also, aforesaid operations are devoid of the need for inventory slack or even eliminates inventory requirement.

3.3.2.3. Scalers

A search for scope of the business could lead to insights of expanding the business. To capitalise on such a scope, a scalable business model is required. A scalable business model is characterised by higher output with relatively lower resources and activity bottlenecks. Hence, it is required to know if the business growth is resource intensive or not. The rational here is how rapidly and easily we can grow our business model with respect to resource and activity bottlenecks. While non-scalable activities are resource

intensive and are not sustainable. Scalable activities could be in the form of third party delegations, licensing deals and franchising.



Fig.3.18. Typical Scalers business model

The case of IKEA: *Delegators strategy*

IKEA's strategic choice of establishing **flat packing**, eliminates the cost of additional labour force for delivery and service. The customer becomes the work force for furniture delivery and assembling. Partly because of IKEA offers easy to assemble **modular designs** that supports this strategic choice. The operational efficiency and learning curves lead to their successful expansion across 49 global markets with 443 stores and growing.



Fig.3.19. Delegators strategy of IKEA

Corporate Actions & Response correlation:

Eliminate or reduce resources: IKEA's strategic choice of establishing **flat packing**, eliminates the cost of additional labour force for delivery and assembling services. The furniture's are ready-to-assemble and cheaper to transport from factory to retail centres. While the rest of the value chain is delegated to the customer. This part of the logistic and service value chain activity is eliminated in the company. Thereby giving cost advantage through reduced resource usage.

Match Activity with Resources and Cost expectations: IKEA's move to manufacture modular designs, without compromising on quality and affordability to the mass market, had a positive and sustainable impact on customer value perception. Flat packing modular manufacturing are results of design and creativity. The designs facilitated quick and easy logistics from manufacturing centre to retail, to scale, to offer affordable price and comfortable assembling.

IP THAT CREATES CONSUMER VALUE FOR R&D CONSUMER LICENSEE WHO BRINGS IP THAT IP TO STRENGTHENS MARKET LICENSEE LICENSEE'S LICENSEES VALUE PROPOSITION INTELLECTUAL PROPERTY SALES FORCE (IP)LICENSING FEE

a) Licensor model



Fig.3.20. Licensing strategy

The case of ARM – Licensors:

Launched in 1990, ARM transformed computer manufacturer to designing and licensing intellectual property for silicon chips. In 2012, these chips are used in almost 95% of today's electronic devices such as cell phone, tablets, and laptop. ARM licenses IP to its global partners ranging from Samsung, Apple, Microsoft etc to almost 1000 partners.

Corporate Actions and Response Correlation:

Detecting and Solving difficult problems: ARM pre-empts imminent technologies in the smart gadgets arena and invest time and resources over research and development of chips and intellectual property. Increasing complexity of chips and incremental performance efficiency in terms of power consumption, processing speed and lower costs have been the key focus of ARM.

Aggressive R&D investment: ARM return on investment takes many years. In 2018, they invested \$773 million dollar in R&D accounting to 42% of 2019 revenues. Similarly, in 2008, R&D expenditure amounted to 87 million dollar or 29% of revenues. While expenditure continues to grow, its recurring returns on investment is absolute and lasting owing to its established global networks and patents.

Capitalise Licensing efficiently: Ability to monetizing R&D through licensing opportunity, ARM earns fixed upfront license fee from partners for each IP delivery and royalties from various other partners for each chip shipped containing ARM IP. License fee estimates around \$1million to \$10 million, while royalties account for 1 to 2% of selling price of Chip linked with ARM IP. As discussed earlier, it licenses IP to over 1000 global partners. Considering the amount of investment in R&D, ARM's revenue covers its cost as well generate recurring revenue, giving them the ability to grow their licensing capability even more through sustainable R&D investment.

3.3.3. Profit Formula Disruption:

A radical change in the way value created are monetized is called profit formula disruption. Based on the level of predictable and recurring revenues and scalability, a

firm may have different pricing mechanism. Innovative pricing mechanism could unlock previously unprofitable markets, and/or increase revenues.

3.3.3.1. Revenue Differentiators

Provided a revenue sources, a firm may differentiate its revenue/pricing mechanism such as recurring revenue, premium or freemium subscriptions and subsidizing revenue stream.

Recurring Revenue: The case of Xerox



a) Recurring revenue model



Fig.3.21. Recurring Revenue Strategy

Corporate actions and Response:

Xerox develops its first plain paper photocopier in 1959, revolutionizing access to information. Since the machine was expensive, they had to lease the machine and monetize per copy value. The company allowed customers for cancellation of its lease with a notice period of only 15 days as one of its value propositions to customers, showing confidence in their machine design and performance. Over a decade since the start of its launch, it made \$400 million worth revenue right up from \$40 million.

Identification of recurring jobs to be done: It follows that recurring jobs that are cumbersome, if replaced by a machine, the value served is high. One such cumbersome process was the disability to take copies more than 20 per day and high-cost services. Xerox identifies this critical problem and invents a machine that can process 2000 copies per day.

Create Asset to monetize sustainably: The invention of xerography made possible the ability to take photocopy on plain paper. The 914-model launched in 1959 took over a decade and significant R&D investment to develop it. Its ability to print 2000 copies, incomparable to any machine at that point of time, as a critical success factor and difficult to imitate. Finally, the leasing method and pay per copy plan together allowed recurring revenue generation for a long term.

Attractive Value proposition: Due to expensiveness of the machine, Xerox leases the machine at \$95 per month instead of \$29,500 dollar a machine, allowing anyone to afford the machine with the comfort of cancelling lease anytime with just 15-day notice. Then, it uses the convenience trap that customers experience using the machine's efficiency.

Freemium strategy: The case of Spotify



a) Freemium model



b) Spotify Business model

Fig.3.22. Freemium Strategy

Corporate Actions and Response:

Spotify, a music streaming platform, kicks in with free online music services competing against the pirate versions available out in the web. It started its service with a freemium model that includes a basic, limited, ad-supported service for free and an unlimited premium for paid subscription. Its key resource component is the music algorithm and its community of users and artists. Its premium subscribers increased from 10% of total users to 46% in a span of 7 years by 2018. Also, shifted its music download options to streaming on go disrupting Apple iTunes.

Corporate Actions and Response:

Attract a large base of users: Free music service tends to attract large user base for free, while also increasing the likelihood of switching to premium service. User bases tend to use the music app for a long period of time, partly giving the opportunity to learn music preference and user behaviour. While, ad services subsidize the free service to some extent, it also suggests convincingly to switch to premium and enjoy more benefits.

Manage retention and churn: According to Forbes articleⁱ, Spotify tries to win loyalty during the onboarding phase, during one of the most important period of brand's relationship with customers. Spotify's onboarding tactics include making customers feel welcomed after signing up, subscribe or after purchase with a dedicated email describing the full benefits of premium service. Its able to give new users to find their

favourite artist, which it uses to create personalised playlists. *This signifies one of the effective on-boarding programs of Spotify. To demonstrate value to its prospects, its usually beneficial to offer lower price, to go after highly competitive sectors.*

Freemium vs premium value proposition: Spotify through its freemium model was able to attract 248 million users in 2019 of which 54% consumer free music. While the rest of 46% of premium users generate 90% of the total revenue. To the music companies, Spotify pays about 10\$ billion in royalties, paying a significant portion of its revenue. *Owing to this very high value proposition to both users and partners, the brand value increases significantly at the cost of free users. Also, with benefits of premium subscriptions, over time its churn rate fell to a record low 4.6%.* Moreover, additional ad-on services to existing subscribers through strategic revenue sharing partnership allows it to diversify its offering beyond music platform. *Hence, positioning its service and timing of offering the service are key to conversion rates in this industry.*

ⁱ 1. <u>https://www.forbes.com/sites/serenitygibbons/2020/02/18/how-to-outperform-your-competitors-like-spotify/</u>

3.3.3.2. Cost Differentiators

While revenue differentiators ensure cashflow, cost differentiators use cheaper activities and cheaper assets to deliver benchmark value amongst the competitors. In theory, if all competitors have equal market share, the most benefits are reaped by the ones with game-changing cost structure. Digging into details, cost structure in a labour-intensive firm include labour and time, in resource intensive includes assets management and value chain management.

Resource Dodgers: The case of Airbnb

Airbnb is a platform that connects travellers with property owners that are willing to rent extra room or extra space available to hosts, making it attractive for owners. Travelers wanting to visit unique, unexplored places find the platform as an opportunity to visit those places. Their match-making platform identifies idle assets of registered owners and through marketing scales their user base. Its business model is based on light-resource cost structure and does not own any assets by innovatively partnering with owners of assets.



Fig.3.23. Resource focused strategy



Fig.3.24. Airbnb Business model

Corporate Actions and Response:

Less Resource intensive planning: Airbnb understands the cost involved in asset management such as maintenance, staff, and services. If a room is not rented, there is sunk cost involved. It went around this structure to an innovative cost structure, where it offers a platform bridging the gap between travellers and property owners, allowing owners to monetise their unused assets and home rentals for vacation. All these without Airbnb owing any of the properties or its related costs. Its focuses primarily on marketing and search algorithms to supplement the right information user seeks in a robust manner.

Double-side Platform Value proposition: Offers a platform bridging the gap between travellers and property owners, allowing owners to monetise their unused assets and home rentals for vacation. Airbnb makes the platform attractive for hosts by building a pool of travellers seeking accommodation. The benefits are perceived by both hosts and travellers. The more the value delivered, the more its transaction cut for providing the services. The business has ability to scale with almost negligible marginal costs.

3.3.3.3. Margin Masters

At the bottom of the model, another aspect of revenue generation is by boosting margins. Higher margins are generated by focusing on what customers are willing to pay for the most, while controlling cost structure. Customers are willing to pay high price for which they value the highest. Focusing on those values and prioritizing profitability over market share will generate higher margins. Again, it is critical to have beneficial cost structure and the products or services to hold higher pricing potential. For this purpose, firstly, try to **reduce constrainers** (reduce high cost, increase value simultaneously). Secondly, introducing products and/or services at the **high end of the market** spectrum will service high-end customers and maximise margin without landing on costly luxury niche.



a) A Contrarian Model



b) CitizenM Business Model

Fig. 3.25. Contrarian Strategy

CitizenM is hotel concept-based business that serve the mobile customer segment. Contrary to the traditional hotel business that does not offer focused services but more broad service package which some customers (mobile customers) do not find essential, CitizenM developed its service based on few focused customers whose needs range from essential conveniences to luxuries. In this manner, it was able to reduce cost and create service that reflect high quality perceptions. With this model they maintain high profit margin per room.

Corporate Actions and Response:

Elimination of costly elements: CitizenM builds prefabricated room, removing all costly elements that are not essential the mobile customers. Elements like spa, gym, fine dining, mini bar and room services are eliminated achieving low construction cost. The rooms have essential elements and high empowered customer relationship. Eliminates HR cost by appointing small cross-functional teams achieving reduced labour cost.

Creating more value at less cost: CitizenM characterises its customer as those travellers who visit a city for 1 or 3 days for short vacation, shopping, and entertainment. By offering rooms with essential elements and high empowered customer relationship, it has established the love mark brand among its customers. Their room service offers great mattresses, pillows, sound-proof wall, and vibrant room experience. It streamlines cleaning and linen service by partnering with new operators. Also, rooms are equipped with WIFI and 24-hour food services.

Blue ocean Strategy:

Eliminate (-) - Minibar and room service - Fine-dining table-seated restaurant - Focus on traditional star rating - Fitness, wet areas, spa	 Raise (7) Occupancy rate and revenue per room Effective use of space Focus on narrow customer segment Margins Customer satisfaction and service ratings Level of standardization Free broadband WiFi and video on demand 		
Reduce (≥)	Create (+)		
- Construction costs	- Empowered all-round staff		
- Maintenance costs	- New segment: mobile citizens		
- HR and operations costs	- Room factory and prefab construction		

Fig. Four Action Framework: CitizenM

Establish business at strategic locations: CitizenM launches its fabricated houses in Amsterdam, a city characterised by aforesaid customer segments. Global travellers with shorter trips willing to spend time on touring and just need a place to accommodate at night. By 2019, CitizenM operates 20 hotels in 13 tourist rich cities on three continent and planning to expand further.

High enders: The case of iPhone:



a)

High-Ender model



b)	Apple iPhone business	model
/	11	

Fig.3.26. High-ender Strategy

In 2007, Apple combines internet, music player into a mobile phone with touch based sensitive screen without a keyboard sold at heft 499\$ and sold 270 thousand units in one weekend.

Corporate Actions and Response:

Design and surprise the high-end market segment: In 2007, Apple designed and developed the iPhone encompassing smart design, technology, and simplicity. Introduces the model with novel approach and prices high to position itself as premium brand putting most of the market out of reach.

Control Cost: Since Apple does not manufacture the device, it rather effectively manages supply chain. Its popularity gives them the upper hand to request suppliers to keep the cost low and maintain potential device secrets.

Maximise Margins and profit from High end market segment: Apple has sustained 60-70% of profit margin in the last decade. Not the least, despite 14.5% sales, it captures 94% of the industry's profit. Through its virtual app store, it delivers additional ad-on services developed by App developers. Thereby, earning a cut of 30% from app revenues.

Continuously reinvent and surprise: Apple has launched 12 generations of iPhone alongside various technological innovation built in the device. Its primarily focus on camera, touch, software performance and security features. Its determined incremental innovation often gives the buyer the willingness to upgrade his/her old device.

Chapter 4: Proposition of a hypothetical Entrepreneurial model as a tool for strategic guidance.

4.1. Methodology:

Table 9: Methodology

Methodology	Chapter 1: Understandin g Corporate Scripts and Schemas	Chapter 2: Understanding of various Smart City Typologies	Chapter 3: Analysis of Business Strategies in Smart city	Chapter 4: Proposition of a hypothetical Entrepreneurial model as a tool for strategic guidance.
Steps	Introduction to Corporate Scripts and Schemas. Contextual factors affecting scripts and Schemas Relationship between Scripts and Schemas and Corporate Entrepreneurs hip. Causation and effectuation approach.	Introduction to Smart City. Examining Typology of smart cities. Classification of Smart City based on six smart city characteristics, spatial approach.	Examining Business model patterns shifts in smart cities. Customer-driven approach . Resource-driven approach Finance-driven approach. Case study illustration of the discussed patterns . Identifying entrepreneurial response actions and classification of response action.	Analysing Scripts & Schemas relevance with smart city using conformity test. Analysing Smart city dimensions using conformity test. Examining Entrepreneurial Opportunities associated with smart city characteristics. Analysis of Business Pattern and Business Shifts from entrepreneurial perspective.
Method	Literature review and desk research	Literature review and desk research	Literature review and desk research	Desk research

Source	Smart city related Journals, book, HBR links and others	Smart city related Journals, book, HBR links and others	Smart city related Journals, book, HBR links and others	Smart city related Journals, book, links, and others
Results	Development of Entrepreneuri al Script & Schemas model	Identification of contextual conditions based Entrepreneurial opportunities	Identification of smart approaches and strategies highly relevant in Smart city.	Development of the hypothetical Entrepreneurial model

4.2. Analysing Scripts & Schemas relevance with smart city using conformity test.

Table 10. Entrepreneurial Schemas and Scripts Conformity

Dimension conformity	Impacts	Scripts & Schemas Flow
Technology = Collaborative	Public engagement exists. Technology stimulate public participation	Changing external schemas and scripts
	Consolidation approach is followed. Suitable for highly fragmented urban city	
Organisational dimension	Realisation of productivity, efficiency accelerated by process innovation, governance, and strategic innovation. Suitable for a short horizon planning, not a sustainable goal.	Changing Internal scripts and schemas
Experimental Dimension = organisational	There is more interaction among the stakeholders. Collaboration with more productive urban actors. Knowledge exchange is suitably transparent.	Learning new schemas and scripts

The table relates impacts created by a smart city in terms of dimensions such as technology, organisation, collaboration, and experimentation. City experiencing socioeconomic transactions at a productive rate, supported by efficient human capital and Private-Public-People cooperation are the ultimate drivers of smart city development. Hence, conformity with the above-mentioned dimensions aligns with smart city development objectives. The scripts and schemas suggest dimensional flow of knowledge between the society and the department of interest. *Entrepreneurial take-ins could be adopting these scripts and schemas into their working culture which*
consequently funnels associated causation and effectuation strategies and action plans.

4.3. Analysing Smart city dimensions using conformity test.

	т	• • • •	1	1 0 1
Table 11: Smarty	Tvpology	characteristics	and Dimensi	onal conformity

Environment	Characteristics	Conformity
Digital City	 High quality ICT technology usage prevail. Boost local transaction and fulfil needs. Enable societal transformation Official and unofficial information collection 	Technology dimension Collaborative dimension
Eco City	 Green Promotion activities/ Green movements Eco-friendly markets are less explored Green Projects (PPP projects) Green Tax incentives green vehicles, green buildings, material waste management, renewable energy equipment, Social life quality 	Experimentation dimension Organisation Dimension
Smart City	 Provide Living labs or incubators Triple-Helix models exist (University-Industry- Government relationships) Co-creation, exploration, experimentation, and evaluation opportunities (piloting, researching) All aspects of Digital city 	Technology dimension Collaborative dimension Organisation Dimension Experimentation dimension
Ubiquitous City	 E-services and Applications Short term projects Public-Private-People Partnerships Socio-technical networking Urban Clusters of industries, university, and community. 	Collaborative dimension Organisation dimension Technology dimension

	Knowledge spillover effectsTacit knowledge abundance	
Knowledge based city	 Provide Living labs or incubators Triple-Helix models exist (University-Industry- Government relationships) Co-creation, exploration, experimentation, and evaluation opportunities (piloting, researching) 	Organisation Dimension Experimentation dimension
Media/internet city	• Broadband and media infrastructure that support the commercial centre and enterprises	Technology dimension Collaborative dimension

4.4. Examining Entrepreneurial Opportunities associated with smart city characteristics.

S.No	Smart city Characteristics	Entrepreneurial Opportunities
1	High ICT quality and Usage	 Creative Industry cluster Digital Media Resources and applications Data Curation/ Processing Needs Big Data Cloud based services Availability of Open data SME opportunities in [Sensor technology, P2P Business, Grid technology.
2	Business-led Urban Development	 Socio-technical networking Urban Clusters of industries, university, and community. Knowledge spillover effects Tacit knowledge abundance
3	Social Inclusions approach	 E-services and Applications Short term projects Public-Private-People Partnerships

Table 1	12: Entrep	oreneurial (Opportunities	associated	with	smart	city	characte	ristics
	1		11				•		

		•	Local Patriotism increase stickiness of talent pool.
4	High-tech & Creative industry	•	Provide Living labs or incubators Triple-Helix models exist (University- Industry-Government relationships) Co-creation, exploration, experimentation, and evaluation opportunities (piloting, researching)
5.	Social and Environmental Sustainability	•	Green Promotion activities/ Green movements Eco-friendly markets are less explored Green Projects (PPP projects) Green Tax incentives green vehicles, green buildings, material waste management, renewable energy equipment, Social life quality

4.5. Analysis of Business Pattern and Business Shifts from entrepreneurial perspective.

Table 13: Business Patterns in association with Smart city characteristics

Business Pattern	Strategy	Conformity analysis	Reason	Case study
1. Frontstage	Market Exploration Strategies		•	Tesla Motors
	Visionary	Conforms with High tech & Creative Industry characteristics Conforms with environmental sustainability Characteristics Conforms with ICT quality and usage	Because Tesla co- creates and experiments with its drivers and partners to pool data for autonomous driving technology. They focus on eco- friendly, sustainable energy source for environmental benefits, social benefits	
	Repurpose	Conforms with ICT quality and Usage	Because M - Pesa disrupts the cashless transaction using existing ICT infrastructure,	M-Pesa

		Conforms with Business Led urban development	disrupts the banking systems. Affordable money transfer was possible, by which value created expanded the market to previously unbanked.	
	Channel Kings			
	Disintermediator (Direct)	Conforms with ICT quality and Usage	Elimination of cost intensive intermediaries, adoption of E- service allowed low- cost pricing of its products online. Conforms with sustainable business approach.	Dollar Shave Club (DSC)
	Gravity Creators			
	B2B or B2C Lock in effect/ Stickiness Scalers	Conforms with High Tech & Creativity Conforms with ICT quality Conforms with sustainability	Continually innovates and reinvents windows & its applications. Empowers ICT usage, data driven feedback system, networks with partners and urban clusters. Dominant designs and high user convenience make it sustainable business.	Microsoft Windows
2. Backstage	Resources Driven			
	User base castling	Conforms with ICT quality and usage Conforms with Business led urban development	Uses real-time data driven navigation systems. Using free services instrumentalizes users as data providers directly and indirectly.	Waze

	Conforms with High-tech and creative industry.		
Platform Castling	Conforms with ICT quality and usage Conforms with Business led urban development	Uses real-time data, channelizes two market groups using ICT, Urban clusters allowed market capitalisation and socio-technical relationship.	DiDi Ride service app
IP Castling	Conforms with Business led urban development Conforms with High-tech and creative industry.	Urban clusters support sophisticated, luxury, R&D capability, and funding. Collaboration, R&D, exploration, experimentation, and evaluation opportunities exist.	Dyson
Activity differentiator			
Sustainability Masters	Conform with social and environmental sustainability Conforms with creative industry approach	Aligns their activities with environmental objectives. Uses recycled and eco- friendly process in its activities. Relies on continuous exploration, experimentation opportunities.	Patagonia
Speed Driven	Conforms with ICT quality and usage Conforms with Business led urban development	Speed requires real time data processing and data driven decisions. Socio- technical relationships, urban clusters support speed culture.	Zara

	Build to order	Conforms with ICT quality and usage Conforms with High Tech and Creative industry Conforms with Business led urban development	ICT enables to build a platform and build network, communication channels. Urban cluster supports such experimentation and socio-technical networking. Tacit knowledge supports the technical knowledge.	Dell
	Delegators	Conforms with High tech and creative industry	Because co-creation activities exist.	IKEA
	Licensors	Conforms with Business led urban development Conforms with High-tech and creative industry.	Urban clusters support sophisticated, luxury, R&D capability and funding. Collaboration, R&D, exploration, experimentation, and evaluation opportunities exist.	ARM, computer chip manufacturer.
3. Profit Formula Disruption	Revenue Differentiators			
	Freemium	Conforms with ICT quality and usage Conforms with High Tech and Creative industry Conforms with Business led	ICT enables to build a platform and build network, communication channels. Urban cluster supports such experimentation and socio-technical networking. Tacit knowledge supports	Spotify

	urban development	the technical knowledge.	
Recurring Revenue	Conforms with Business led urban development Conforms with High-tech and creative industry.	Urban clusters support sophisticated, luxury, R&D capability and funding. Urban cluster supports such experimentation and socio-technical networking.	Xerox
Cost differentiators			
Resources dodgers	Conforms with ICT quality and usage Conforms with Business led urban development Conforms with Social life sustainability	Less resources intensive planning requires high level of co-creation activities with public and partners. Urban clusters, ICT quality, user base support inter-relationship remotely. Societal benefits exist in such model like learning effects, entrepreneurship, spill over effects.	Airbnb
Margin Masters			
Contrarian	Conforms with ICT quality and usage Conforms with Business led urban development	ICT drives almost any unconventional business through easy access to markets and partners. Niche concepts are suitably tested in urban cluster environments and factor conditions available there.	CitizenM

High Enders Dependant strategies: Love mark branding, Operational Excellence, R&D.	Conforms with ICT quality and usage Conforms with High Tech and Creative industry Conforms with Business led urban development	Urban clusters support sophisticated, luxury, R&D capability, and funding. Urban cluster supports such continuous innovation, experimentation, and socio-technical networking.	Apple iPhone
--	---	---	--------------

Table 14: Business Pattern shifts in association with Entrepreneurial Approaches

Shift type	Shifts up	Factors that cause the shift up	Action type	Shift Down	Factors that cause the shift down	Action Type
Value proposition shift	From - To			From - To		
	Product - Service	Market requires recurring service	Causation approach	Service - Product	Opportunities to scale products amongst services	Causation and effectual approach
	Low Tech - High Tech	Leverage technology activities Transform value proposition Radically change cost structure Extend reach	Causation and effectual approach	High Tech - Low Tech	Cost leadership activities and resources, support Low Technology and delivers values customers appreciate	effectual approach
	Sales - Platform	Market has large users and third	Dynamic effectual approach	Platform - Sales	Opportunities to add products and	Dynamic effectual approach

Frontstage driven shifts		party services/product Connecting these two market using technology cost less. Has low marginal cost.			services in the same platform that holds the potential to increase revenue.	
	Niche - Mass market	Learning economies exists in niche and leads to developing capability to extend to mass market. Adapt branding, marketing to mass market and extend reach.	Effectual approach	Mass - Niche market	Customer's most value products and services lead to pursue series of niche market segments.	Causation approach
	B2B - B2C	Brand relevance and visibility become important against commoditisation.	Effectual Approach	B2C - B2B	Economies of learning from B2C resources, infrastructures allow to extend services to B2B	Causation approach
	Low touch - High touch	High touch factor increases experience quality and hence premium charges fall on service/product. Improves value proposition	Effectual Approach	High Touch - Low touch	Some parts of high touch experience are not valued by customers. Switching them to low touch experience does not affect	Causation approach

					customer value.	
Backstage Driven Shifts						
	Dedicated Resources - Multi-Usage Resources	Resources like R&D, assets may offer other market opportunities. New value proposition can be offered using the same resources.	High level causation approach	Multi - Usage - Dedicated Resources	If the resources and activities support a single focused market needs, and support revenue significantly, companies switch to dedicated resources approach.	Effectual approach
	Asset Heavy - Asset Light	High fixed cost and high capital expenditures the decision to focus on client services by outsourcing much of the operations.	Causation and effectual approach	Asset Light - Asset Heavy	Powerful light assets like IP and Brand may attract heavy asset investment along with higher competitive advantage.	High level causation approach
	Closed - Open	Approach external R&D/ IP or share internal R&D/IP as a means to develop new value proposition in a dynamic market.	Effectual approach	Open - Closed	If the there is potential for efficiencies in cost, knowledge, or profit by internalising R&D, IP, resources and activities.	High level causation and effectuation approach
Profit Formula Driven Shifts						

High cost - Low cost	Price sensitive market segments Reconfigure activities and resources to disrupt cost structure.	Effectual approach	Low cost - High cost	Focus on price- insensitive market segments. Leverage current resources and activities to offer higher value proposition.	Causation approach And effectual approach.
Transactional - Recurring Revenue	Market is characterised by recurring customer jobs- to-be-done. Solution: Create recurring value proposition.	Causation and Effectual approach	Recurring - Transactional Revenue	Transactional revenue in addition to recurring revenue improve customer purchase power and boost overall revenue.	Effectual approach
Conventional - Contrarian	High cost of activity and resources are barriers. By eliminating/ reducing costly activities and resources and creating lost value with low cost methods.	High level Causation approach	Contrarian - Conventional	High cost activity and resources, symbolise luxury and may lead to high end brand.	Effectual approach

4.6. Development of the hypothetical Entrepreneurial model

4.6.1. Causation and Effectuation Model:



Fig.4.1. Modified version of dynamic effectuation using scripts and schemas

New ventures are readily exposed to fragmented and flexible decisions-making based on available resources. Such firms tend to emerge as an unplanned course of action upon facing specific opportunities rather than formalised strategy. But **formal process** is particularly valid when the sectors in which they operate demonstrate stability to analyse, develop strategic decisions and actionable plans. Since there are more dimensions to strategy approach, Fig. *Scripts and Schemas mapping with strategy development*, represents the strategy formation stance and their relevant schemas and scripts dimensions which could direct the decision-making process.

As sustainable businesses are characterised by global outlook, scalability, complementary clusters, and networking effects, the entrepreneurial scripts and schemas should take the form of global orientation from the beginning to form a strong organisation principle. The *means and possible actions* identify the firm's philosophy in terms of proactiveness, capacity for risk taking and competitive aggressiveness. This behaviour implies *willingness to export distant markets*. Because global approach lays the roadmap for sustainable business development creating attractiveness for crowding in investments and partners. This approach aligns with the global structure elements such as concentration, global integration, local industry internationalisation, venture capital, etc.

4.6.2. Development of Global Approach for new ventures



Fig.4.2. Characteristics of Business model having a Local pitch/geographical stickiness



Fig.4.3. Characteristics of Disruptive business model having a Global Pitch



Fig.4.4. Framework of Entrepreneurial Action based on uncertainty

4.6.3. Entrepreneurial intent and behaviour guidance model: *Combination of causation and effectual approach:*

Combination 1: Higher degree of prediction coupled with lower degree of control allows appropriate planning – a strategy that implies prediction as basis for action.

Combination 2: Higher degree of control and lower degree of prediction allows a transformational strategy using the current means with collaborative and co-creative approaches to build a possible future.

Trigger: High degree of perceived uncertainty and a less advantageous resources trigger effectual logics in the planning to action strategy. Of the above-mentioned simultaneous causation and effectuation logics are observed empirically on several occasions.



Fig.4.5. Example of Internal Scripts & Schema flow in an organisation (Global approach) adopted from the book "Invincible Company".

4.6.4. Global approach to Strategy development:



Fig.4.6. Scripts and Schemas mapping with strategy development

As exemplified earlier, there are more dimensions to strategy approach, Fig. *Scripts and Schemas mapping with strategy development,* represents the strategy formation stance and their relevant schemas and scripts dimensions which could guide the decision-making process.

Formal: Formal process include idea formulation, evaluation, viability check and feasibility throughout opportunity recognition. But formal process is particularly valid when the sectors in which they operate demonstrate stability to analyse, develop strategic decisions and actionable plans. *(Robust Schemas & Script – Planning approach)*

Emergent: Strategy process is subject to fragmented & flexible decisions constrained by available resources. Yet, from a global perspective, the new venture is unlikely to proceed without sufficient resources for a formal process. *(Weak Schemas & Scripts – Learning approach)*

Visionary: Is characterised by intuitive capacity, experienced and long-term vision. The decisions are constrained by cognitive traits such as creativity, optimism, risk propensity, locus of control, self-efficiency, and competences to operate in cross-national environments. *(High level Schemas & Scripts – knowledge approach)*

Collective: Cultural values play important role in decision making. Team mental models, cognition and opportunity recognition are different. Yet a brings a set of decisions based on similarities and shared criteria. (*Novel Scripts & Schemas – Culture approach.*)

Negotiation: Business concept and object come to agreement based on networking effects of founders and relevant partners in the network. Exploitation opportunity depends on the access to technology, customers, resources, suppliers, international market, and local institutional tie ups. Strategies are already conceived here. *(Executive Scripts & Schemas – Power approach)*

Reactive: Global orientation shapes the new venture response to structural inertia. Partly, decision making is supported by imitation of established corporate culture and recurrent decisions related to scope, scale, and speed. Imitative behaviour spreads uniformity in the region because of spill over effects and geographical stickiness. *(Adaptive Scripts & Schemas – Environmental approach)*

Transformation: This process depends on the configuration of above-mentioned process. New ventures co-creative and collaborate during these processes based on peculiarities such as entrepreneurial profile, organisation and process, and structural characteristics of the business environment.



Fig.4.7. Strategy pattern approach to strategy formation for new venture

The strategy approach from the Table based on case studies can be used to approach a novel integrated business model. The speed, agility and easiness depend on the team size, cognitive capacity, and networking abilities. Yet the above (Fig) approach is directive and objectively guides an entrepreneur for a desired outcome.



Fig.4.8. Manifestation model adopted from Nicholls Balanced score card approach

Based on means and strategic choices, the interactions and commitment can be demonstrated using the above manifestation model. As the model convincingly fits in the interaction and commitment zone, it helps to project the cognitive phenomenon therein. The agents carrying out the manifestation depends on organisation size and team size. Firm having global orientation, seek a higher-level schema and script possessed by experts (stakeholders/partners). The conceptual manifestations thereby composed of three quantitative and qualitative approach 1. Positivists, 2. Critical theorists and 3. Interpretive

Positivists stance: this stance enhances performance of the organisation using quantitative and qualitative data and execute the plans.

Critical theorists: this stance supports resource acquisition through various stage such as internal processing, learning, growth, strategy, and financial perspectives.

Interpretive: this stance establishes organisational legitimacy by demonstrating customer perspective, mission, strategy, communication of organisational objectives to the stakeholders to build legitimacy.

	Discovery	Validation	Acceleration	Execution and Scaling
Trend Recognition	Market size Opportunity size \$ Customer jobs, pains, and gains Problem/solution fit Willingness to pay (basic evidence)	Value proposition Willingness to pay and pricing (strong evidence) Feasibility (basic evidence)	 Product/market fit Feasibility (strong evidence) Acquisition and retention Profitability 	Revenue (or user) growth
Viability check	Is there an opportunity?	Can we create value in this market?	How can we best create demand and grow?	How can we scale our organization to satisfy deman
Team size	1-3	3-8	8+	Unlimited
Scripts & Schema bewilderment approaches	Envision and motivate Question fundamental assumptions Pattern recognition Pivot Business model	Envision and motivate Pattern recognition Pivot Business model	Envision and motivate Lead domain matter experts Business model	Motivate and engage Scale Hire Manage
Scripts & Schema requirement	Resourceful Testing Extreme adaptability Perseverance	Testing Prototyping Perseverance	Domain matter expertise and building Marketing Perseverance	Leadership, execution, and scaling Deep domain matter expertis Hiring Eurotional expertise

Fig.4.9. Overview of the Entrepreneurial approach for new ventures

4.7. Conclusion and future works:

After careful study of smart cities, we come to conclude there are various type of smart cities based on the type of e-services, spatial approach, and technological roadmaps. The study led to the elaboration of smart city characteristics in terms of entrepreneurial opportunities. Further, letting us know what causes entrepreneurial spirits in different types of smart cities such as digital city, eco city, ubiquitous city etc. Based on the characteristics, its convincing to suggest that strategical decisions and actions are associated to the smart city contextual conditions therein. Since there are similar smart city and different smart city concepts due to the difference in available resources, socioeconomic and political conditions, its quiet complex to identify a unanimous contextual approach, rather broad contextual approaches were feasible to relate for every smart city. Although smart city concepts vary drastically from one another, the technological roadmap suggests a defined direction of smart city evolution. Thanks to the various research papers on smart city, entrepreneurship studies and well researched case studies on contextual strategies, which allowed to propose a broad entrepreneurial approach in response to broad environmental trends that conform with previously mentioned "defined direction of smart city evolution". The analysis allows me to conclude with a corporate entrepreneurial model using three broad inter-dependant, dynamically & continuously evolving approaches. As exemplified earlier, as there is conceptual dissimilarity among similar smart cities and different smart city, entire research of this paper is analysed through the lens of the above proposed model that can also be used as entrepreneurial guidance model. Other outcomes from the study of various case studies and research lead to the proposal of two hypothesis. Hypothesis 1: Businesses characterised by global pitch tend to have many similar markets, making them scalable and long-term or vice versa. Hypothesis 2: Businesses characterised by regional stickiness/pitch, tend to have less similar market, forcing them to be sustainable niche, and/or non-scalable and/or short term.





Fig.4.10. Hypothetical model of Entrepreneurial Approach for Smart city: 1.1. Global business orientation, 1.2. Localisation of business, 1.3. Entrepreneurial Approach model

4.7.1. Future works:

Since the new arena is a smart city, evidence show disruptive approaches suitably leveraging on given conditions. Also, it is more pressing to research into this area given the speed at which technologies and new venture arise in the urban clusters and globalisation. Various research papers are available on business strategies, entrepreneurship, smart city concepts which were observed with different perspective to project the exactness yet without much dynamism. It is in my interest to analyse the same field and research works of highly knowledgeable authors through the lens of a dynamic entrepreneurial approach. This study has carefully relied on well-established research papers & books and adopted sufficiently for the development of an entrepreneurial approach which could be used for developing a framework for new venture creation in the future work.

Bibliography

 [1] Robert P. Garrett, Jr., Tommie Welcher, 2018, Corporate Entrepreneurship as a Survival Routine, Emerald Insights, *https://doi.org/10.1108/S1048-*473620180000028005.

[2] Chris Richter, Sascha Kraus, 2015, The Smart City as an opportunity for entrepreneurship, Int. J. Entrepreneurial Venturing, Vol. 7, No. 3, 1 - 13

[3] Leonidas Anthopoulos and Panos Fitsilis, 2013, Using Classification and Roadmapping techniques for Smart City viability's realization, Electronic Journal of e Government Volume 11, Issue 1 2013, 2 - 11.

[4] Robert P. Garrett, Jr., Tommie Welcher, 2018, The Challenges of Corporate Entrepreneurship in the Disruptive Age, Corporate Entrepreneurship, Emerald publication, https://doi.org/10.1108/S1048-473620180000028005, 1 - 13.

[5] Anastacia Mamabolo and Kerrin Myres, 2019, Performance Measurement in Emerging Market Social Enterprises using a Balanced Scorecard, Journal of Social Entrepreneurship, Journal of Social Entrepreneurship, Strategic Management, Strat. Mgmt. J., 20, 421–444

[6] Bruce R. Barringer and Allen C. Bluedorn, 1999, The Relationship between Corporate Entrepreneurship and Strategic Management, Strategic Management, Strat. Mgmt. J., 20, 421–444.

[7] Maura McAdam, James A. Cunningham, 2019, Entrepreneurial Behaviour Individual, Contextual and Micro foundational Perspectives, Dublin, Ireland and Newcastle upon Tyne, UK, Palgrave Macmillan, 3 - 4, 96 - 102.

[8] Tobias Kollmann, Andreas Kuckertz, Christoph Stöckmann, 2010, E-Entrepreneurship and ICT Ventures: Strategy, Organization and Technology, Hershey, Newyork, Business science reference.

[9] Maja Nilssen, To the smart city and beyond? Developing a typology of smart urban innovation, Faculty of Social Sciences, Norway, ELSEVIER.

[10]MeijerandBolivar,'Governingsmartcity',https://doi.org/10.1177/0020852314564308

[11] Caragliu, A., Del Bo, C., Nijkamp, P., 2011. Smart cities in Europe. J. Urban Technol. 18(2), 65–82.

[12] Alex Osterwalder, Yves Pigneur, Fred Etiemble and Alan Smith, 2020, The Invincible

Company, Hoboken, Newyork, Wiley, 144 - 204