1. **A prototype for IoT based car parking management system for smart cities**
   Baratam, M Kumar Gandhi
   Indian journal of science and technology, 2016, Vol. 9, No.17, May
   Present day's car parking has become a major issue in urban areas with lack of parking facilities and increased amount of vehicles, due to this drivers who are searching for parking space they were roaming around the city in peak hours. This causes traffic, waste of time and money. Methods: To solve those problems, this prototype is developed using sensor circuit, RFID and IoT. RFID used here to detect the car details, IR sensor is used to find the presence of the car and all details are accessed from remotely through IoT. Findings: This system helps user to find parking space availability with the help of Internet of Things (IoT) technology by providing parking free space information. The IoT maintains the database of the parked vehicles through a shared server. So drivers can book the slots in advance and the parking information updated in server. In addition to the parking, theft management will be done i.e. a theft vehicle came for parking then the number plate is checked with theft list in the database, if it is in theft list then a message is sent to the police. Applications/ Improvements: This prototype developed for the parking system with less human interaction, increases flexibility and security. This system is employable in airports and multiplexes parking. (Research Gate)
   [https://www.researchgate.net/publication/303553620_A_Prototype_for_IoT_based_Car_Parking_Management_system_for_Smart_cities](https://www.researchgate.net/publication/303553620_A_Prototype_for_IoT_based_Car_Parking_Management_system_for_Smart_cities)

2. **A study on awareness level of mobile wallets servies among management students**
   Manikandan, M; Chandramohan, Dr S
   A mobile wallet is a virtual cash wallet can be used for instant payments and other transactions through a mobile application. With the help of Smartphone one can do all the financial transactions nowadays. With the preamble of mobile wallet, it has become extremely convenient for a person to make cashless transactions. We can say it as a technology development but it also gives a boost to business through the development of digital commerce and banking. The mobile wallet, especially the prepaid feature, is proving very effective in emerging economies such as India, where access to the internet and banking opportunities are a privilege, but mobile accessibility is high. A large number of companies have cropped up in India, offering consumers this product called 'mobile wallet', there is still a lack of awareness among...
people about the concept and its utility. Young and relatively affluent customers are surprisingly, more interested in mobile wallets. This paper outlines the awareness level of mobile wallets services among management students in Alagappa Institute of Management. This paper also gives the reasons for the poor practice of mobile wallet services. (Google scholar)

3. Acceptance of e-wallet services: a study of consumer behaviour
Varsha, R; Thulasiram, M
International Journal of Innovative Research in Management Studies (IJIRMS), 2016, Vol. 1, No. 4, May
In today’s scenario, smart phones have become an important part in day to day activities. As it becomes more affordable, the usage of smart phone users is getting drastically high. Smart phones are not just useful for social media, videos and taking selfies. They have now become an important part of our day to day activities for making payments for various options. “E-wallet is an online prepaid account where one can stock money, to be used when required. As it is a pre-loaded facility, consumers can buy a range of products from airline tickets to grocery without swiping a debit or credit card, provided their wallet is filled with sufficient amount required for payment”. Service like e-wallet is innovation facilitating more easier payments at the time of requirement. The primary purpose of this study is to obtain a picture of the level of acceptance of this technological innovation as a mode for settling bills and making payments. The study also examines the influence of various demographic factors on this consumer behavior. The study involved obtaining first hand information from more than 300 users of this service. The study was conducted in Trichy and Thanjavur districts of Tamil Nadu. Stratified random sampling was used to arrive at the sample for the study. Chi square, Correlation tools have been used to analyze the data obtained. Implications for marketers have also been provided.

2016
Disclosed is a method, system, and computer-readable medium for enabling a cross-platform, multi-component customer centric system for parking is provided. The method includes identifying a plurality of payment options which allow a customer to balance convenience, expense and self-service to enable a customer centric parking experience. The method also a plurality of means by which a customer can engage or book parking combining corporate information, loyalty information, customer affiliation information and proprietary revenue management techniques which enable a highly customer centric set of choices on how, when and where to book parking. (Google scholar)
https://www.google.com/patents/US20160314508

5. Determinants of Consumers’ Adoption of Mobile Parking Payment Services in Kenya
Komo, Lee; Kyando, Eusebius; Ngare, Philip
We conduct a study on consumers” satisfaction and acceptance of mobile parking service: EJJIIPAY, in Nairobi City-Kenya. We begin by assessing consumers” satisfaction of EJJIIPAY since its launch. We perform factor and cluster analysis on a sample data collected amongst mobile parking payment users in Nairobi. The analysis gave evidence that EJJIIPAY provides advantages on reliability, cost savings and access. We then determine what actions consumers are likely to take after using the service, determine usage habits and acceptance of the service. Our results shows that the new mobile parking payment innovation has not only improved county returns but also led to higher levels of consumers” satisfaction. We therefore conclude that EJJIIPAY service is an important parking solution for Nairobi City. The service curbs corruption, maximizes parking revenues and is an efficient payment system. We also survey trends of the mobile parking payment technologies in other cities and best implementation strategies that will help enhance their usage. (Google scholar)
http://jetems.scholarlinkresearch.com/articles/Determinants%20Of%20Consumers%20Adoption.pdf

6. Do Car Drivers Really Need Mobile Parking Payment? A Critical Evaluation of the Smart Service apparkB in Barcelona
Ilhan, Aylin; Fietkiewicz, Kaja J; Stock, Wolfgang G
apparkB is a mobile parking payment application, which has been developed and implemented in the city
of Barcelona, Spain. We empirically analyzed the awareness of Barcelona’s citizens of this service, the users’ satisfaction with it and their need to use it. Mobile applications are important services in smart cities, as they support citizens’ daily tasks. To critically evaluate apparkB we deployed the information service evaluation (ISE) model. In order to get data on apparkB we applied an online survey, conducted interviews with Barcelona’s smart city authorities, and performed rapid ethnographical field research in April 2016. Only a minority of Barcelona’s citizens use this service, as they do not know it or do not use a car in the city. However, those who really use it articulate a need and are satisfied with apparkB. https://link.springer.com/chapter/10.1007/978-3-319-58637-3_19

7. Educating Consumers about Digital Wallets
Nair, Amal; Dahiyi, Manisha; Gupta, Naman; Yadav, Rachna; Mehta, Richa
Wallets have been used from thousands of years to protect and carry personal items of value. The earliest value wallets or satchels were a piece of cloth tied with a piece of string which enabled a range of items such as coins to be carried out to market. Humans have always been mobile and have needed a container to securely carry personal items. People consume for both necessity and pleasure. Basic items such as food and clothing are purchased on a regular basis but people also buy goods which are only for enjoyment purpose. For this instance, we have digital wallets which are online platforms that stores users’ payment information and passwords and allows them to make electronic commerce transactions and make their life easy. Out of the many benefits of electronic wallets, few of the important ones are transferring money, paying bills and services like payment to cab services. Apart from the goodwill gaining factors like ease of access and ease of use, it is extremely useful for huge unorganized sector where cash is considered as the most appropriate medium. People are from different backgrounds and respond differently when it comes to the use of digital wallets. Thus it is important for the organizations of the digital wallets to segregate the customer segmentation for the wallets as per the people who wants to use and respond towards the wallet. Also after seeing so many frauds and cases recently related to cash, people feel that this is the future and will be the most famous mode of currency transaction. (Google scholar)

8. Effective car parking reservation system based on internet of things technologies
Sheelarani, P; Anand, SP; Shamili
World Conference on Futuristic Trends in Research and Innovation for Social Welfare, 2016, 29 Feb.-1 March
Nowadays with the rapid increase in urban population, there is a major problem with the parking system in almost every major city across the globe. Many of us get highly disturbed when there is no proper space for parking space for our vehicles. In this article, we have proposed a smart parking application, where users will be able to park their automobiles by finding an empty parking lot through Android Application or can even park. (ieeexplore.ieee.org) http://ieeexplore.ieee.org/document/7583962/

9. Efficient Automated Smart Parking System using IOT Technologies
Bhadkumbhe, SM; Narayan, Anuj; Narayan, Dnyaneshwar; Shaikh, Sarfraj; Kunjir, Yogesh
Imperial journal of interdisciplinary research, 2017, Vol. 3, No.4
The number of non-public vehicles usage is increasing. individuals like personal vehicles to commute than rely upon public transportation. Finding a parking zone in most metropolitan areas, particularly throughout the push hours, is troublesome for drivers. it's usually frustrating for drivers to seek out parking areas, and parking itself is a problem in nearly each major town within the world. In this paper, an automatic automobile parking application is proposed that regulates the amount of cars to be place on selected park. The proposed application keep tracks of free and occupied by parking slots. The user can reserve a parking slot by selecting the area. An estimated buffer time will be calculated between the source and destination places. The reservation will be cancelled if the user reached the parking slot after the buffer time. The payment of usage of parking service will be done using wallet.(google scholar) http://www.imperialjournals.com/index.php/IJIR/article/view/4584/4400

10. Futurizing” smart service: implications for service researchers and managers
Wuenderlich, Nancy V; Heinonen, Kristina; Ostrom, Amy L; Patricio, Lia; Sousa, Rui; Voss, Chris; Lemmink, Jos GAM
The purpose of this paper is to craft a future research agenda to advance smart service research and
practice. Smart services are delivered to or via intelligent objects that feature awareness and connectivity. For service researchers and managers, one of the most fascinating aspects of smart service provision is that the connected object is able to sense its own condition and its surroundings and thus allows for real-time data collection, continuous communication and interactive feedback. This article is based on discussions in the workshop on “Fresh perspectives on technology in service” at the International Network of Service Researchers on September 26, 2014 at CTF, Karlstad, Sweden. The paper summarizes the discussion on smart services, adds an extensive literature review, provides examples from business practice and develops a structured approach to new research avenues. We propose that smart services vary on their individual level of autonomous decision-making, visibility and embeddedness in objects and customer lives. Based on a discussion of these characteristics, we identify research avenues regarding the perception and nature of smart services, the adoption of smart services, the innovation through smart services as well as regarding the development of new business models. Smart services is a new emerging topic in service marketing research, their implications on organizations, customers and the service landscape have not been fully explored. We provide a fresh perspective on service research by characterizing relevant aspects of smart service that will stimulate fruitful future research and advance the understanding and practice of smart services. (Emerald)


11. How Guangzhou’s use of payment apps sets a path ahead – website
Rohaidi, Nurfilzah
Gov Insider, 2017, May 8
In the 1980s, the Chinese leader Deng Xiaoping was experimenting with openness and economic reforms. Guangdong province, of which Guangzhou is the capital, was chosen to trial out a new approach. In 2017, Guangzhou remains a bellwether. Guangzhou hopes to be on par with global cities like New York, London and Singapore in the not-so-distant future. In particular, it’s prioritising e-payments, healthcare and transportation data.

12. Impacts of low citizen awareness and usage in smart city services: the case of London’s smart parking system
Chao, Guo; Peng, Alex; Nunes, Miguel Baptista; Zheng, Luqing
Smart city applications and services are increasingly considered as strategic means to cope with emerging global challenges such as climate change, pollution, the ageing population, and energy shortage. In particular, smart parking is a type of smart services used to improve traffic congestion and pollution within cities. Nevertheless, although smart city services are driven by advanced information technologies, their success is highly dependent on user engagement, which is historically problematic. This paper presents and discusses the results of a case study on the smart parking service in London. A questionnaire (involved a total of 212 local drivers) was adopted as the main data collection method. This was complemented by the collection and analysis of 470 online user comments left for the service. The results showed that London’s smart parking service may potentially help each driver to save an average of £68 (62.2 $) on petrol annually and reduce CO2 emissions by 238.14 kg per car per year. At city level, a smart parking system could help London save £183.6 million worth of petrol per year and reduce its annual CO2 emissions by 642,978 tons. However, public awareness, actual usage, and user satisfaction of this smart service are currently very low. These present substantial barriers to realise the potential economic and environmental benefits of the service. This paper concluded that further to the very technological efforts, local authorities and service providers need to make a stronger endeavour to enhance public engagement and user satisfaction towards smart services, in order to realise the promises of such solutions. (Google scholar)

13. Inspiring Trust & Loyalty: Crossing Channels in Service-Based Companies: Why use book parking?
Balaji, TS; Arumugham, Jagan; Knuycky, Leslie; Sinclair, Misty
As the physical and digital worlds become increasingly intertwined, seamless cross-channel experiences have become crucial to providing an excellent customer experience [5]. The customer experience is

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established and shaped throughout the entirety of the relationship with a company, regardless of where, when or how those interactions occur. Successful information architects and researchers now address the end-to-end experience as they design and test in a cross-channel world. The need for attention to the broader customer experience is particularly pronounced in a service-oriented company. This case study describes the efforts of one team of information architects, visual designers and researchers implementing a cross-channel design and testing model within a service-based organization. This paper is presented as an illustration of how cross-channel design principles should be applied differently within the context of a service-industry and demonstrates how the team created internal cross-channel user testing principles based on service-focused, cross-channel design principles. (Ebscohost) http://journals.sagepub.com/doi/pdf/10.1177/1541931215591096

14. Internet of Things Approach to Cloud-based Smart Car Parking
Atif, Yacine; Ding, Jianguo; Jeusfeld, Manfred A
Procedia Computer Science; January 2016, Vol. 98, No. 1, pp.193-198
Concerns for parking are becoming imminent to best support the urban core. These persistent parking problems could be turned into new opportunities, brought by current trends in meeting the globally connected continuing. This paper reveals a work-in-progress to capitalize on private land properties for parking, in order to relieve stress on public agencies, create new sources of revenue, and enlist new entities in the intermediary market. These intermediaries, labelled as Parking Service Providers (or PSPs) play a broker role through advertising parking lots on a shared cloud platform. To streamline these business collaborations and related processes, physical parking lots are augmented with Internet connectivity allowing cloud-provided applications to congregate these lots into a larger inventory. The Internet of Things (IoT) paradigm expands the scope of cloud-based intelligent car parking services in smart cities, with novel applications that better regulate car-parking related traffic. This paper presents a work-in-progress agenda that contributes to new business solutions and state-of-the-art research impacts. We reveal a multi-layered system of PSP-business model through interdisciplinary research blocks where original results are expected to be made at each layer. (Ebscohost) https://ac.els-cdn.com/S1877050916321603/1-s2.0-S1877050916321603-main.pdf?_tid=a7f1f714-dbc7-11e7-9193-00000aab0f26&acdnat=1512703802_1007436126e7e7e35a95fe73d8648714

15. Investigation of Smart Parking Systems and their technologies
Fraifer, Muftah; Fernström, Mikael
Thirty Seventh International Conference on Information Systems, Dublin 2016
The literature review conducted for this paper offers an in-depth review of the recent advances in sensing and communication technology concerning parking systems. In addition, this paper presents a survey and analysis of an academic, qualitative literature review. It includes an in-depth study of the selected topics and provides a step by step implementation process. It reviews different smart parking systems used for parking guidance and parking facility management and gives an insight into the technical aspects and specifications analysis of such systems that have been published in academia during the last 15 years. (Google scholar) http://iot-smartcities.lero.ie/wp-content/uploads/2016/12/Investigation-of-Smart-Parking-Systems-and-their-technologies.pdf

16. Lack of parking creates Sydney no-go zones: NRMA launches new parking finder – website
Page, Rebecca
2017, March 6
More than four in five (85%) of Sydney motorists surveyed admitted to avoiding certain locations for fear of not being able to find a car park, according to an NRMA survey released on the same day the mobility group launches the new parking feature on the my nrma app. In addition, the NRMA survey found that more than 40 per cent (44%) of people have ever returned home from a destination because they couldn't find parking. The my nrma mobile phone app makes it easier for motorists to find convenient parking at the right prices right across Australia. Using the app, motorists can search for and compare prices between most publicly available off-street parking stations, as well as pre-book and pay for spots through Divvy Parking.

17. Mobility as a service (MaaS): challenges of implementation and policy requirements
Li, Yanying; Voege, Tom
Mobility as a service (MaaS) is a relatively new concept, which holds the promise for a paradigm shift in the provision of urban mobility. The concept of MaaS is to use a single app to access and pay for various transport modes within a city or beyond; and the app will give options to allow a traveller to select the most suitable transport mode. The concept of MaaS is enabled by the current mass uptake of smartphones and social media as well ubiquitous internet connection. By studying current applications of MaaS in Europe and US conditions of operation of MaaS have been summarised. Based on the necessary conditions, a checklist has been developed for potential developers of MaaS to assess if they can implement MaaS in a city. This paper also discusses challenges of implementation of MaaS and their potential impacts on urban mobility and societal changes. (Google scholar)

18. Novel vehicle booking system using IOT
Sagar, S Vidhya; Kumar, A Sivanesh
2016 International online Conference on green engineering and technologies, November 2016
This paper aims to manage automatic car parking system with reservation to the next level in IOT. As there is an enormous increase of vehicle usage in each and every place where human lives all over the world makes the scarcity of the parking place for vehicle is increasing rapidly and unavailable. So we have proposed micro-controller based parking lots and GSM is used for monitoring the available spaces through which the reservation is made with the help of android application for the users. The system which we made is very less cost when compared with other parking systems and it's very easy to be managed and used by everyone. (Research gate)
https://www.researchgate.net/publication/316732721_Novel_vehicle_booking_system_using_IOT

19. Parking slot availability check and booking system over IoT
Ramya, M; Sharmila, K; Valarmathi, C; Deepa, D
Asian journal of applied science and technology, 2017, February, Vol. 1 No. 1, pp.149-152
In our day today life, the main problem is parking of vehicles mainly the car parking at a particular destination. Also this problem leads to traffic congestion. This paper proposes the basic concept of using Wi-Fi based smart car parking services in modern cities as an important application of the Internet of Things (IOT).This system will be launched through Smartphone provided and it can be used to monitor or find the empty slots in that area. This system helps to improve the maximum utilization of parking area and reduces the user’s waiting time. (Google scholar)
https://www.slideshare.net/eben4uever/parking-slot-availability-check-and-booking-system-over-iot

20. Queue-less Local Railway Ticket Booking Using Wi-Fi Router
Siddiqui, Farhana; Askari; Sayyed Mohammed
Imperial journal of interdisciplinary research, 2016, Vol2, no. 4
In a city like Mumbai where travelling local trains are said to be lifeline, but the system to book a ticket is very tiring. This product will overcome the difficulties faced by the users. This will save lots of time of the user of standing in the long queue and there is no need to carry the paper ticket for user. We are using a Wi-Fi router as a medium of communication between android based client and VB.net server. Wi-Fi router is capable of handling multiple user requests and also there is no need of internet required for router. It is a very powerful technique for taking railway ticket on own android device in very short amount of time. This makes the system less congested. Older system requires carrying cards and ticket losing them causes inconveniences and proves to uneconomical. Also if you have a smart card using its kiosk require to stand in queue during the peak hours. Making the system less effective in providing hassle-free tickets. In this technique, additional functionality such as GPRS/EDGE or 3G/4G technology which uses internet correction, SMS which introduces additional cost and Bluetooth are not required, only Wi-Fi router is needed at stations. (Google scholar)

21. Scoping Study into Deriving Transport Benefits from Big Data and the Internet of Things in Smart Cities
ED10011, No. 4, 13/06/2017
Big Data refers to both large volumes of data with high levels of complexity and the analytical methods applied such data which require advanced techniques and technologies in order to derive meaningful information and insights in real time. In the transport sector – and particularly in cities – use of Big Data has the potential to realise significant efficiencies along with innovative new products and services, greater
competitiveness and economic growth. Despite the great potential, the level of Big Data exploitation in transport is at a much lower level of maturity compared to other sectors such as retail and healthcare. The purpose of this report is to provide the Department for Transport with a better understanding of the potential opportunities, challenges, enablers, data needs and the possible business models to support Big Data applications in a Smart Cities context. The report was developed over a period of four months, through consultation with key stakeholder experts and a Rapid Evidence Assessment. The transport sector is a vast generator of Big Data - advancements in analytics, enhanced computing and improvements in connectivity through the Internet of Things have opened up the potential to combine and use these big datasets in new ways. The potential transport benefits could be considerable, and include: Greater predictive capacity, leading to better transport and land-use planning; New behavioural insights; Better customer services; Better network utilisation and performance in near-time; and Reductions in accidents, pollution and energy use. Free flowing data also allows better integration of modes and services, thereby improving end-to-end journeys, and underpins commercial innovation, such as Mobility as a Service. Data and improved connectivity, via the Internet of Things, also allows transport to integrate with smart city infrastructure and energy systems leading to new services for citizens, efficiencies and environmental benefits. However, evidence quantifying the potential value of these diverse benefits for the UK economy is currently lacking, as are transport specific use cases. Moreover, the benefits are only maximised when data is used and shared, and meshed with other (transport and non-transport) datasets. However, too often datasets reside in geographical or modal siloes. The main challenges are not technical, but rather other considerations, including identifying suitable commercial business models that benefit all parties. These challenges are compounded by data skills shortages in the transport sector and fears that sharing data will breach privacy, security and competition laws. (Google scholar) https://www.dspace.cam.ac.uk/bitstream/handle/1810/267285/DfT%20Big%20Data.pdf?sequence=1&isAllowed=y

22. **SFPark : pilot evaluation – website**
   SFPark was a federally-funded demonstration of a new approach to managing parking. It used better information, including real-time data where parking is available, and demand-responsive parking pricing to help make parking easier to find. As a federally-funded demonstration of a new approach to managing parking, the SFPark project collected an unprecedented data set to enable a thorough evaluation of its effectiveness. Evaluation findings - The San Francisco Municipal Transportation Agency (SFMTA) evaluated the SFPark pilot project to see how effectively this approach to managing parking delivered the expected benefits. The evaluation showed that after SFPark, San Francisco saw: Average parking rates were lower / Parking availability improved / It is easier to find a parking space / It is easier to pay and avoid parking citations / Greenhouse gas emissions decreased / Vehicle miles traveled decreased. The SFMTA produced four documents as part of the evaluation, available online: Summary of the evaluation findings; Full evaluation report; Overview of SFPark; Technical “how to” manual. Additionally, a library of resources concerning parking sensor technology and methodology is available online.
   http://sfpark.org/about-the-project/pilot-evaluation/

23. **Singapore e-payments drive starts with smart parking – website**
   Rohaidi, Nurfilzah
   Gov Insider, 2017, May 16
   The country will trial a parking app that will replace traditional paper coupons. Singapore is kicking off its e-payments drive by trialling a smart parking app that allows motorists to pay for parking fares using their phones. The Urban Redevelopment Authority, Housing & Development Board, and Government Technology Agency of Singapore are joining forces to develop the app, according to a joint press release. Public sector officers will be conducting a trial of the app from May to June 2017. The trial will be extended to include members of the public later in the year, the release said. The app will provide more convenience for motorists, who previously had to contend with using paper coupons.

24. **Smart Cities: Towards a New Citizenship Regime? A Discourse Analysis of the British Smart City Standard**
   Joss, Simon; Cook, Matthew; Dayot, Youri
   Journal of Urban Technology; 2017, October, Vol. 24, No. 4, pp.29-49
   Growing practice interest in smart cities has led to calls for a less technology-oriented and more citizen-centric approach. In response, this article investigates the citizenship mode promulgated by the smart city
standard of the British Standards Institution. The analysis uses the concept of citizenship regime and a mixture of quantitative and qualitative methods to discern key discursive frames defining the smart city and the particular citizenship dimensions brought into play. The results confirm an explicit citizenship rationale guiding the smart city (standard), although this displays some substantive shortcomings and contradictions. The article concludes with recommendations for both further theory and practice.
(Ebscohost)

25. Smart city or smart citizens? The Barcelona case
Capdevila, Ignasi; Zarlanga, Matías
Journal of Strategy and Management, 2015, Vol. 8, No. 3, pp.266-282,
In recent years, the term “smart city” has attracted a lot of attention from policy makers, business leaders and citizenship in general. Although there is not a unique definition of what a smart city is, it is generally accepted that “smart” urban policies refer to local governments’ initiatives that use information and communication technologies in order to increase the quality of life of their inhabitants while contributing to a sustainable development. So far, “smart” approaches have generally been related to top-down processes of technology diffusion. The purpose of this paper is to present a broader view on “smart” initiatives to analyze both top-down and bottom-up dynamics in a smart city. The authors argue that these two perspectives are complementary and its combination can reinforce the collaboration between different city stakeholders. Top-down and bottom-up initiatives are not opposed forces but, on the contrary, can have a synergistic effect on the innovation capacity of the city. Both perspectives are illustrated by providing examples of different “smart” aspects in the city of Barcelona: smart districts, open collaborative spaces, infrastructures and open data. To illustrate the arguments, the authors analyze the case of the city of Barcelona providing examples of top-down and bottom-up initiatives in four different smart city aspects: smart districts, open collaborative spaces, infrastructures and open data. The research method is based on a case study (Yin, 1984). The primary data consisted on interviews to city council representatives as well as managers of local public institutions, like economic development offices, and local organizations like for instance coworking spaces. The authors interviewed also specialists on the innovation history of the city in order to validate the data. In addition, the authors used secondary data such as reports on the 22@, and documentation on the Barcelona innovation policies, as well as doing a compilation of press articles and the online content of the institutional webpages. All together, the authors have followed a data triangulation strategy to seek data validation based on the cross-verification of the analyzed data sources. The analysis suggests that the top-down and bottom-up perspectives are complementary and their combination can reinforce the collaboration between different city stakeholders. Top-down and bottom-up initiatives are not opposed forces but, on the contrary, can have a synergistic effect on the innovation capacity of the city. Both perspectives are illustrated by providing examples of different “smart” aspects in the city of Barcelona: smart districts, open collaborative spaces, infrastructures and open data. Nevertheless, the analysis has its limitations. Even if the authors have emphasized the importance of the bottom-up initiatives, citizens do not have often the resources to act without governmental intervention. This is the case of services that require high-cost infrastructures or regulatory changes. Also, as it usually happens in the case of disruptive technology, it is hard for citizens to understand the possibilities of its use. In these cases, firms and institutions must play an important role in the first phases of the diffusion of innovations, by informing and incentivizing its use. It is also important to note that some of the emerging usages of technology are confronted to legal or regulatory issues. For instance, distributed and shared Wi-Fi networks might be in opposition to economic interests of internet providers, that often difficult its expansion. It is also the case of services of the sharing economy that represent a menace to established institutions (like the tensions between Uber and taxi companies, or Airbnb and hotels). In these cases, city halls like it is the case in Barcelona, tend to respond to these emergent uses of technology by regulating to ensure protection to existing corporate services. In conclusion, the transformational process that leads a city to become a smart city has to take in consideration the complexity and the plurality of the urban reality. Beyond considering citizens as being users, testers or consumers of technology, local administrations that are able to identify, nourish and integrate the emerging citizens’ initiatives would contribute to the reinforcement of a smart city reality. (Emerald)

26. Smart Parking Application
Lotlikar, Tejal; Chandrahasan, Minla; Mahadik, Ankita; Yeole, Anjali
International Journal of Computer Applications, 2016, Vol. 149, No.9, September, pp 149 -152
The ever increasing population has led to chaotic city traffic. As a result of the process of searching a parking lot becomes tedious. It is time consuming task leading to discomfort. The fuel consumption is on an increasing side due to such scenarios. The increase in vehicular traffic creates a negative impact on the environment. In the wake of smart city times these issues lead us to the need of a „smart” solution. In order to resolve these issues and satisfy the increasing demand for the parking areas, parking management organizations are trying to implement better and technologically advanced solutions. A cloud based smart parking application will enable real time parking availability monitoring and reservation thereby providing better services to the end users as well as reduce the workload of the parking administrator. (Google scholar) http://www.ijcaonline.org/archives/volume149/number9/lotlikar-2016-ijca-911529.pdf

27. The Psychology of Parking
Griffioen-Young, HJ; Janssenvan HJW; Amelsfoort, DJC; Langefeld, JJ
8th European conference on mobility management, 2004, May 5, 6 and 7 in Lyon
As roads become increasingly congested with traffic, parking becomes an increasingly bigger problem for many cities. In order to limit the number of drivers who park in city centres, local governing bodies have implemented various measures with which to influence traffic behaviour. Although, many and diverse mechanisms are currently employed these are insufficient to curb excessive city traffic. Consequently, there is an on-going search for insight into why people drive and park in busy areas despite the inconveniences. In the present study, we examine this issue from a social psychological perspective. http://www.epomm.eu/ecomm2004/workshops/anglais/GriffioenJanssen.pdf

28. The Role of Smart City Characteristics in the Plans of Fifteen Cities
Angelidou, Margarita
Journal of Urban Technology; 2017, October 2017, Vol. 24, No.4, pp.3-28
This paper identifies the characteristics of smart cities as they emerge from the recent literature. It then examines whether and in what way these characteristics are present in the smart city plans of 15 cities: Amsterdam, Barcelona, London, PlanIT Valley, Stockholm, Cyberjaya, Singapore, King Abdullah Economic City, Masdar, Skolkovo, Songdo, Chicago, New York, Rio de Janeiro, and Konza. The results are presented with respect to each smart city characteristic. As expected, most strategies emphasize the role of information and communication technologies in improving the functionality of urban systems and advancing knowledge transfer and innovation networks. However, this research yields other interesting findings that may not yet have been documented across multiple case studies; for example, most smart city strategies fail to incorporate bottom-up approaches, are poorly adapted to accommodate the local needs of their area, and consider issues of privacy and security inadequately. (Taylor & Francis) http://www.tandfonline.com/doi/abs/10.1080/10630732.2017.1348880?journalCode=cjut20

29. Transit Prepayment Challenges: Factors Influencing Customers' Willingness To Purchase High-Value Tickets
Transportation research record, 2014, No.1669, pp.99-1210
Despite the availability of, and benefits associated with, prepaid stored value fare cards, many transit riders continue to select traditional single ride or round-trip tickets for payment of their fares. At the San Francisco Bay Area Rapid Transit District (BART), an effort was made to assess why many riders select low-value fare instruments and to evaluate potential actions to increase the share of riders buying higher-value tickets. The qualitative and quantitative research techniques utilized at BART to explore this issue are described. Focus groups were conducted to identify important decision-making factors, which were later quantified through a telephone survey. Fear of losing high-value tickets coupled with a lack of information regarding the availability of these tickets appears to limit high-value ticket sales. Some possible approaches to encouraging the purchase of high-value tickets may include a last-ride-free feature and increased awareness of the availability of discount tickets at off-site sales outlets. This study provides insight into the decision-making process of customers when purchasing stored-value tickets and can help inform the policy-making process regarding ticket systems. (TRB) http://trrjournalonline.trb.org/doi/pdf/10.3141/1669-16

30. Understanding the Internet of Things ecosystem: multi-level analysis of users, society, and ecology
Shin, Dong-Hee; Park, Yong Jin
Digital Policy, Regulation and Governance, 2017, Vol. 19, No.1, pp.77-100
This study aims to conduct socio-technical analysis of the rapidly evolving Internet of Things (IoT) ecosystem and industry, including such factors as market growth and user experiences, policy and the impact of IoT on various areas. By applying a multi-level socio-technical framework to IoT in South Korea, this study seeks an ecological understanding of how IoT will evolve and stabilize in a smart environment. The study shows the values influencing potential users' adoption of IoT by integrating cognitive motivations and user values as primary determining factors. Along with user modeling, the findings reveal the challenges of designing, deploying and sustaining the diverse components of IoT, and provides a snapshot of Korea's current approach to meeting these challenges. The study's findings offer a contextualized socio-technical analysis of IoT, providing insight into its challenges and opportunities. This insight helps to conceptualize how IoT can be designed and situated within human-centered contexts. (Google scholar)  