

Cloud computing in mobile technology

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ABSTRACT

Portability among the masses is currently in vogue. In the years to come, work in cloud blurring figuring is relied upon to reach more noteworthy statures. In spite of the fact that, another flood of development has broken shores, an inconceivable scope lies yet unexplored. The versatile cloud is Internet-based information, applications and related administrations got to through PDAs, smart phones, and other convenient gadgets. Mobile distributed computing is separated from portable figuring as a rule on the grounds that the gadgets run cloud-based Web applications instead of local applications. Mobile distributed computing is a system, or a model, which permits portable applications to be assembled, controlled and facilitated utilizing distributed computing innovation. In this model, the cloud performs the asset hungry exercises, for example, processor-concentrated undertakings and putting away huge lumps of information. Utilizing a customized calculation to search out the most brief course to a given cloud asset on the web, this model keeps up its own particular database. When a mobile device connects to the internet to seek a cloud based resource, the model identifies has kept track of with the aid of its constantly updated the application of mobile computing in terms of m-commerce i.e sales through mobile network, one of the key strategy that can be adopted to provide on the spot delivery of goods, enhance sales promotion through customer satisfaction, reducing the time constraints. This paper deals with this sales promotion through sales force automation.

KEY WORDS: Mobile cloud computing, Chunks Of Data, Algorithm, Database, Internet.

1. INTRODUCTION

Flexible circulated registering implies the openness of disseminated processing organizations in a convenient space. It intertwines the parts of compact frameworks and conveyed registering, thusly giving perfect organizations to adaptable customers. In convenient circulated processing, PDAs needn't trouble with a powerful course of action ensuing to all the data and obfuscated figuring modules can be arranged in the fogs. Mobile dispersed registering is the usage of disseminated processing in mix with splendid PDAs. Conveyed processing exists when errands and data are proceeded with the web rather than on individual devices, giving on-interest access of data. Applications are continue running on a remote server and after that sent to customer. Because of the impelled change in compact projects by virtue of Apple and Google over the late years, about each flexible should have a suitable system as demonstrated by the need. This suggests the designers will have an a great deal more broad business division and they can evade constraints made by compact working structure. Adaptable circulated processing gives new association chances for compact framework suppliers as well.

Mobile Cloud Computing has three components, mobile device, wireless communication channel and cloud. Mobile devices have resource constraint in terms of battery power, memory, processing power and have different types of hardware, operating system, and input -output interface. Wireless communication channel has distinctive radio access innovations, for example, GPRS, 3G, WLAN and WiMax with variable system conditions as far as constrained and insecure transmission capacity. Cloud Computing is facing various security and privacy challenges. Security and protection issues in portable distributed computing are acquired from distributed computing and versatile processing. Because of resource constraints, heavy security algorithm can't be run on mobile device.[7-9] We need to do efficient task portioning between cloud and mobile to resolve the security and protection issues in Mobile Cloud Computing (Sapna Malik, 2012). As a legacy and advancement of distributed computing, assets in versatile distributed computing systems are virtualized and doled out in a gathering of various dispersed PCs as opposed to in customary nearby PCs or servers, and are given to cell phones, for example, cell phones, compact terminal, thus on.(see Figure. 1). In the mean time, different applications based on mobile distributed computing have been produced and served to clients.

Mobile cloud computing (related works): Versatile processing (Mahadev Satyanarayanan, 2010) implies utilizing compact gadgets to run remain solitary applications and/or getting to remote applications through remote systems. In versatile distributed computing portable system and distributed computing are consolidated, along these lines giving an ideal administrations to versatile clients. Distributed computing exists when errands and information are continued the web as opposed to on individual gadgets, giving ondemand access. Applications are keep running on a remote server and after that sent to the client.

Mobile Cloud Computing: A portion of the uses of versatile distributed computing are Google's Gmail drive, Maps and Navigation frameworks for Mobile, I-cloud from Apple Moto Blur from Motorola(with a unique component called remote wipe) Amazon 's new "cloud-quickened" Web program Silk. Silk is a "split program whose product lives both on Kindle Fire and EC2. The applications fortified by versatile distributed computing incorporate portable business, portable learning, and versatile medicinal services and different territories. Portable applications broadened

broad offer in a worldwide versatile business sector. Different portable applications have drawn in the rewards of Mobile Cloud Computing. The accompanying are the couple of surmisings:

m-Commerce: Versatile trade (m-business) is a purchasing and offering of items utilizing cell phones. The m-trade applications typically used to accomplish a few undertakings that require portability (e.g., versatile exchanges and instalments, portable informing, and versatile ticketing). The m-business applications need to face different entanglements (e.g., low system data transfer capacity, high intricacy of cell phone setups, and security). In this manner, m-trade applications are coordinated into distributed computing environment to illuminate these issues (X. Yang, 2010)

m-Learning: Versatile learning (m-learning) is an electronic learning (elearning) and portability. On the other hand, customary m-learning applications have confinements regarding high cost of gadgets and system, low system transmission rate, and restricted instructive assets (Chen, 2010; Gao, 2010; Jian Li, 2010). Cloud based m-learning applications are introduced to fathom these constraints, for instance using a cloud with the substantial stockpiling limit and intense handling capacity, the applications offer learners with much agreeable administrations as far as data size, preparing pace.

m-HealthCare: MCC in restorative applications is utilized to minimize the impediments of customary medicinal treatment [e.g., little physical stockpiling, security and protection, and therapeutic mistakes (Kopec, 2013)]. Versatile human services (m-medicinal services) offers portable clients with proper access assets effectively. m-Healthcare gives social insurance associations a differing qualities of on-interest administrations on mists instead of standalone applications on neighborhood servers.

m-Banking: M-Banking is an uprising in conventional managing an account administrations, where client can profit the bank administrations gave to them through their versatile regardless of area and time (Li, 2001). Exchange should be possible regardless of the fact that client is occupied in his standard work by means of SMS or the versatile Internet yet can likewise utilize extraordinary projects, called portable applications, downloaded to the cell phone.

m-Game: Versatile amusement (m-diversion) is a forthcoming business sector creating salaries for administration suppliers. M-amusement can totally offload diversion motor requiring extensive registering asset (e.g., realistic rendering) to the server in the cloud, and gamers just collaborate with the screen interface on their gadgets (Jasleen, 2013) shows that offloading (sight and sound code) can spare vitality for cell phones, in this way expanding diversion playing time on cell phones.

Let us consider a real time example for mobile computing in m-commerce by taking into account the sales force automation of a company. The objective of this study is to realize the influence of cloud computing and mobile technology in terms of sales.

Cloud Solution and Mobility Solution: Enable Enterprise user to access right information at the right time and on the move towards faster action and improved ROI

- More market focused and customer savvy
- Better visibility on internal business processes / operations
- Offers the right products to the right customers at the right time/ Service
- Improve customer loyalty, as well as the top and bottom lines of the organization
- Improve service quality levels –access to data to convey on-the-spot, constant data to clients
- Operate all the more proficiently – save money on travel and availability issues, construct more profound business connections and enhance efficiency
- Gain a Competitive point of interest – moment access to valuing and stock levels
- Enter new markets – execute business where it happens, paying little heed to area or availability
- Make representatives more gainful – get to and work with 24 x 7

Cloud Solution and Mobility Solution adoption - Verticals and Solutions

Banking / Insurance

- Financial inclusion
- Premium calculation and collection
- Claims processing
- SFA - Customer support personnel
- Asset tracking for audit compliance
- Mobile banking

Healthcare

- Real-time critical equipment monitoring and tracking
- Blood bag tracking
- Real-time patient tracking
- Online medical history

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- OT readiness
- Specimen tracking
- Inventory tracking of pharmaceutical products
- Availability of patient data

Manufacturing

- Raw material re-ordering
- Raw material pilferage control
- WIP tracking
- Production / Batch control
- Work order management
- Finished Goods Tracking
- Asset visibility

Retail

- Price checking
- Shelf edge labelling
- Queue bursting
- Inventory control
- Promotions – e-coupons
- Sales Force Automation
- Work order management
- Repairs and returns

Sales Force Automation: Sales Force Automation (SFA) – General Trade for Dealer Management System (DMS) & Non Dealer Management System model for Fast Moving Consumer Goods- Personal Care Division

Objective: - Intelligence to the last business mile

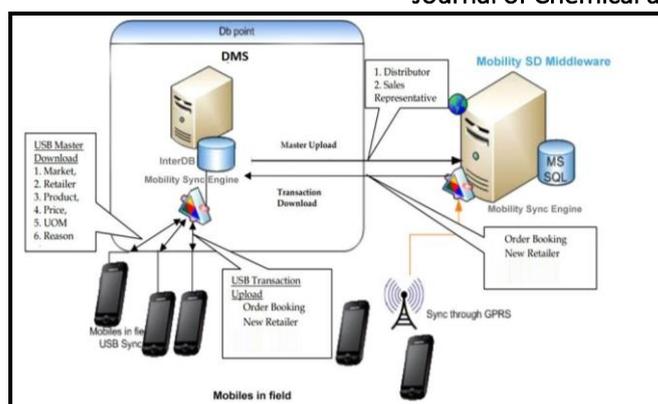
SFA improves visibility to secondary sales and true market demand (Retailer-level, SKU-wise unconstrained orders) for distributors/channels & integrates into DMS solution Parties (or) Cloud -Web portal for Non-DMS parties and throws insight on various dimensions on Beat, Outlet, and Product & Salesman performance to the management.

SFA has been developed & deployed for Window based mobiles & delivers the following high level features list.

- Order management
- Collections Management
- Sales return
- Schemes & discounts
- New outlet addition
- Merchandizing
- Sync – DMS Solution to PDA & vice-versa
- Reports

Key benefits:

- Effective Order taking mechanism can be adopted by syncing the Retailer's order into Distribution Management software thereby Delivery process will be smoothen
- Salesman productivity & No. of calls attended can be monitored/supervised effectively by the various levels – Territory Manager/AM/RM/GM Sales
- Results effective Route management, facility to add up New outlets & there by Market penetration will be increased
- Reduces Paper works/frequent interactions between Salesman & Depo during Market visit
- Promotions can be conveyed to the retailer/outlet at the beginning/end of the order booking
- Collection entries can be made against the Bill & Ageing analysis can be tracked by the Salesman
- Other features like Merchandizing can be done for New promotional activity/New product launch etc.,



**Figure.1. SFA – Solution Architecture
Functionalities (in detail)**

Module	Description
Master Data	Master Data for Intermediate DB from DMS will be sent by RS-Connect through Interface. Then the below masters are ready to flow to PDA, <ul style="list-style-type: none"> • Product Master along with hierarchy level • Price Master • Outlet Master • Market Master • Sales Representative Master • Scheme Master
Sync (Download Master data)	Synchronize the Master data from the Intermediate DB to the PDA devices using USB through Envision Sync Service.
Sync (Upload Master data)	Upload the Master data from the Intermediate DB to the SD Middleware using Envision's Interface engine.
Outlet selection	Once a user (salesman) logged in, a route is selected. Target Vs achievement on Value, Lines and MSL will be shown if it is available. Based on the selected route, retailers are listed. Covered retailers will be highlighted in green color.
Stock Checking	Salesman will enter the closing stock /current stock in order to know the current stock in hand for each retailer.
Order taking	For the selected retailer the products are listed based on the filter conditions applied (brand / category). If any of the products provided with Scheme/Offer, it should be highlighted. UOM quantity would be based on piece or strips for all products. According to the entered UOM, product value will be selected and calculate the net value.
Sales Return	Return of items is collected along with reasons.
Collection entries	Based on the generated invoice the payments are collected. Outstanding payments are done on both the ways. (Partial/Full).
New Outlet creation	New outlet can be created from PDA. When a new outlet is created, the order can be taken immediately. The following are the fields that need to be captured in the new outlet creation. Name, Address, Contact Person, TIN No., Class, Category, Phone number and Email along with Route selection.
Target Display	Route Wise target & achievement will be Shown. Target types are cumulative (Sales/MSL/TLS).
Image Capturing	Require provision to capture the window display image.
Non-Productive Entry	Option to enter Reason for Non-Productive calls.
Sync (Upload Transaction data)	Upload the transaction data from the PDA device to the SD Middleware through Envision Sync Service (through GPRS).
Sync (Download Master data)	Download all transaction data from SD Middleware to the Inter DB using Interface engine.
Reports	The PDA will show the reports to view the day to day transaction details (Order, Collection, Coverage and Sync Summary Reports).

System Requirements:

Windows Mobile PDA

Rugged Windows Mobile 6.0 and above with the basic features and the following mandatory specifications

✓ Network : GPRS (for internet connectivity)

Back Office Mobility Front-End Web Server

✓ PDA communicates with centralized hosted application using http/https protocol

✓ Data exchange between Intermediate Server and the PDA device will be through XML Web Services run on IIS 6.0.

✓ Intel processor with 2 GB RAM and 160 GB HDD

Back Office Portal /PDA Back-End Database Server

✓ Database: MS SQL Server 2005 and above

✓ Intel Xeon Processor with 3.x GHz speed, 8 GB RAM and 160 GB HDD

2. CONCLUSION

Versatile Cloud Computing, as an improvement and augmentation of Cloud Computing and Mobile Computing, is the most developing and all around acknowledged innovation with quick development. The mix of distributed computing, remote correspondence framework, compact registering gadgets, area based administrations, portable Web and so forth has established the framework for the novel processing model. In this paper we have given an outline of Mobile Cloud Computing structural planning, that help the mobile user to connect their cloud resource within a short time or searching the resource in a short time.

REFERENCES

Achudhan M, Prem Jayakumar M, Mathematical modeling and control of an electrically-heated catalyst, International Journal of Applied Engineering Research, 9 (23), 2014, 23013.

Gopalakrishnan K, Sundeep Aanand J, Udayakumar R, Electrical properties of doped azopolyester, Middle - East Journal of Scientific Research, 20 (11), 2014, 1402-1412.

Gopinath S, Sundararaj M, Elangovan S, Rathakrishnan E, Mixing characteristics of elliptical and rectangular subsonic jets with swirling co-flow, International Journal of Turbo and Jet Engines, 32 (1), 2015, 73-83.

Kansas MO, Ahsan Habib Md, Manowarul Islam Md, Primary Exploration of Mobile Learning Mode under a Cloud Computing Environment, practical exposure in cavincare private limited, 2013.

Ilayaraja K, Ambica A, Spatial distribution of groundwater quality between injambakkam-thiruvanmyiur areas, south east coast of India, Nature Environment and Pollution Technology, 14 (4), 2015, 771-776.

Kerana Hanirex D, Kaliyamurthie KP, Kumaravel A, Analysis of improved tdt algorithm for mining frequent itemsets using dengue virus type 1 dataset: A combined approach, International Journal of Pharma and Bio Sciences, 6 (2), 2015, 288-295.

Lingeswaran K, Prasad Karamcheti SS, Gopikrishnan M, Ramu G, Preparation and characterization of chemical bath deposited cds thin film for solar cell, Middle - East Journal of Scientific Research, 20 (7), 2014, 812-814,

Premkumar S, Ramu G, Gunasekaran S, Baskar D, Solar industrial process heating associated with thermal energy storage for feed water heating, Middle - East Journal of Scientific Research, 20 (11), 2014, 1686-1688.

Sundar Raj M, Saravanan T, Srinivasan V, Design of silicon-carbide based cascaded multilevel inverter, Middle - East Journal of Scientific Research, 20 (12), 2014, 1785-1791.

Thooyamani KP, Khanaa V, Udayakumar R, Application of pattern recognition for farsi license plate recognition, Middle - East Journal of Scientific Research, 18 (12), 2013, 1768-1774.

Thooyamani KP, Khanaa V, Udayakumar R, Efficiently measuring denial of service attacks using appropriate metrics, Middle - East Journal of Scientific Research 20 (12), 2014, 2464-2470.

Thooyamani KP, Khanaa V, Udayakumar R, Partial encryption and partial inference control based disclosure in effective cost cloud, Middle - East Journal of Scientific Research, 20 (12), 2014, 2456-2459.

Thooyamani KP, Khanaa V, Udayakumar R, Using integrated circuits with low power multi bit flip-flops in different approach, Middle - East Journal of Scientific Research, 20 (12), 2014, 2586-2593.

Thooyamani KP, Khanaa V, Udayakumar R, Virtual instrumentation based process of agriculture by automation, Middle - East Journal of Scientific Research, 20 (12), 2014, 2604-2612.

Thooyamani KP, Khanaa V, Udayakumar R, Wide area wireless networks-IETF, Middle - East Journal of Scientific Research, 20 (12), 2014, 2042-2046.

Udayakumar R, Kaliyamurthie KP, Khanaa, Thooyamani KP, Data mining a boon: Predictive system for university topper women in academia, World Applied Sciences Journal, 29 (14), 2014, 86-90.