

A Practical Study on Harnessing the Power of Citizen Developer Concept Through the Development of UDIMS- A No-Code Based Inventory Management System

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Abstract:- To demonstrate the efficiency of citizen development concept by developing an end to end scalable Inventory Management System using a no-code platform.

Information Technology(IT)- within the scope of this document refers to the segment of business or individual entity involved in the development (or) use of any computers, storage, networking and other physical devices, infrastructure and processes to create, code, process, store, secure and exchange all forms of electronic data and develop applications.

UDIMS(Unified Distribution and Inventory Management System) LCNC(low-code no-code)

I. INTRODUCTION

Citizen development (also called citizen application development) is a term used to describe the recent trend of businesses empowering traditionally non-technology based employees to collaborate with IT departments to build business applications. IT departments sanction tools and security and provide direction in regard to application design and development, while non-IT employees focus on the actual application-building process. It speeds up app development, cuts down costs, and improves productivity and the effectiveness of work by making application development faster and less costly. There's a growing need for citizen application development in every organization. However, IT departments can't build new apps on time because they have a huge backlog of work. This means even simple apps take months or years to build. For this reason, businesses around the world have started using LCNC platforms that allow citizen developers to build software in days and weeks.

II. NEED FOR CITIZEN DEVELOPMENT

In most organizations, IT departments have such a huge backlog of work they don't respond to new requests promptly. They are overwhelmed by an unending request pipeline and keeping up is impossible. This is where the need for citizen led development comes in.

1. 71%[1] of business leaders agree that IT teams have a lot of new solution requests they aren't working on.
2. A study by 451 Research revealed that integrating LCNC tools can boost development efficiency by 50%-90%[1].
3. 41%[1] of respondents have active citizen development programs, while 20% plan to start them.

By 2025, the number of citizen developers will be four times more than that of professional developers. The development concept in question will definitely lead to democratizing the reach of technology to everyone. Businesses that devote time and resources to the citizen development community have seen an uptick in efficiency and productivity. Previously, businesses wasted time waiting for IT personnel to solve a problem, but citizen development has become standard practice at many companies engaged in application creation.

Moreover, any employee who learns and understands the application of LCNC platforms can use it as a software developer or share that knowledge with a fellow employee, growing the citizen developer community. In both instances, operational efficiency increases in any business process..

III. RUNNING AN EXPERIMENT OF LCNC IN THE FIELD OF COMMERCE

Commerce has evolved throughout various phases in history right from a simple barter system to complex interconnections. With the advent of Information Technology, there have been several transformations in the way people and businesses interact with each other. One such attempt in transformation is our concept called UDIMS. The proposed system aims at providing an one point end to end solution.

The main aim behind this experiment was to test the effectiveness behind citizen development. We at DCKAP wanted to test how soon a hypothesis can be turned into a proof of concept and then introduced into a market. The following were the advantages that we found out:

A. *Improved Efficiency in Experimentation*

Research and Development Teams in the company have one major challenge. To bring their concept into something tangible, this often poses a major challenge in resource management as to develop something new always consumes more time and costs, but with the advent of citizen development the lead time is reduced and the need for a huge resource base is dimmed.

B. *GTM(Go to Market) Effectiveness*

As much as it's important to have the right product, having it in the right time matters more. With citizen development centered around the principle of LCNC, the time taken from an idea conceptualization to having a fully developed application is less compared to what a traditional method of development would consume

C. *Agile Inherently*

The LCNC method of development is more adaptable to change requests with minimal effort proving to be agile in nature. Most changes and suggestions could be incorporated effortlessly as compared to traditional development methods.

D. *Recovery Objectives*

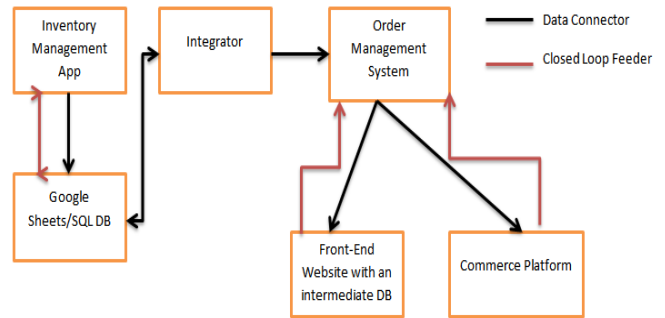
With the inbuilt iterations concept, any changes that we make are captured as new iterations meaning we can sample between different test versions but always having the capacity to roll-back to the stable version with a click of a button. Both RTO and RPO are supported.

Now all this was tested when we developed a mobile application called UDIMS using this concept. The major focus of this research is how the citizen development concept helped us to achieve a solution. The UDIMS abbreviated as Unified Distributor and Inventory Management System is not just an application but an ecosystem.

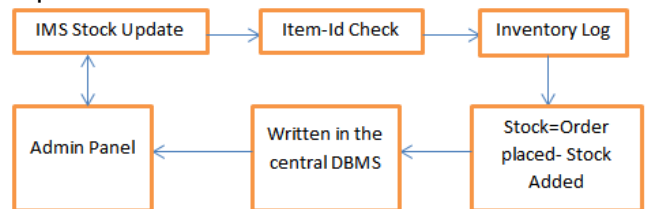
IV. THE PRINCIPLE BEHIND UDIMS

The key to efficiency and robustness in managing an inventory comes from having a well-connected infrastructure. Seamless connectivity ensures reduced latency and failure points. This is the heart of UDIMS; it connects the store and the store-keeper in ways that promote ease of business. To keep things simple at the end user side, we identified that one common accessory that all people use are the mobile. Next came the question, can I start a business and have the luxury of managing it digitally if I own a mobile and the answer is YES!, through UDIMS. The principle behind the system is that it uses the existing hardware capability of the mobile-phone to interface with the physical world. The collected signals are then passed onto the application layer which then processes the signal and performs an action corresponding to the logic set. The accumulated DB is connected to our own in-house product the integrator which allows the product to be scaled, the integrator is bridged with the Inventory App in the mobile. This integrator can then be coupled with the website/commerce platform. The seamless two way connection is always provided between the app and the end-point; this ensures the real time stock values are accurately captured. Each component is provided with their own user interface to achieve scale down also, such that businesses can adjust their operating costs.

V. WORKING SCHEMA AND TECHNICAL ASPECTS:



The System is linked through Dynamic API calls. Irrespective of the stage where we are in, the numeric values remain constant. The App uses the Android SDK layer to interact with the camera sensor. Any event inside the app is translated into a trigger which gets logged in Google Sheets; the sheets are connected in such a way that changes in sheet directly are also reflected inside the app. This is a closed loop system. The Bridge to the integrator is done through the API calls. The working logic is explained below:



This Closed loop is then bridged with an integrator which acts as a central hub and act as a BUS interface to any front-end domain. Any changes in the front end can be traced back to the central DBMS with minimal latency eliminating manual data collection.

VI. THE WHY OF UDIMS

Every solution begins with why we need such a solution in the first place, the below four statements are the motivating factors for developing such a system.

A. Small-Scale Retail Businesses mostly do not have dedicated software that helps them to keep a track of their inventory. *Small and Informal shops and Business will now have the ability to manage their goods on par with well-established big shops through UDIMS*

B. Retail Businesses such as Supermarkets who have POS systems have an outdated legacy system that uses its own infrastructure. *No complex servers or full-sized PC needed, everything can be done and monitored in your mobile*

C. Platforms to support Mobile-Only Business models are not available. *- Have an idea to start a retail shop, install the UDIMS app, add your items and there you go.*

D. Dynamic Operating Costs: *The key point of our systems is that we have incorporated modularity in each component, such that those components has their own UI, so in case of slowdowns, you can scale-down from a full-fledged e-commerce platform to just a mobile app thereby enabling you to adjust operating costs.*

E. Existing Commerce Offerings often don't support modularity that deprives the customers in scaling and choosing the IT components. *- We support integrations with*

multiple systems as we respect your choice, you choose we integrate- DCKAP Commerce, Shopify, BigCommerce, Adobe Commerce, Simple Front-end websites.

VII. SCALABILITY AND MODULARITY

The whole ecosystem was developed with two main objectives- being scalable to be able to adapt to varying business sizes and the second being modular- where certain features can be removed/added based on the nature of business.

VIII. CONCLUSION

The capability of citizen development in how businesses transform their ideas in proof of concepts is endless. In this experiment, we have demonstrated the use of such a concept to solve a problem-statement in Inventory Management..

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