

A Conceptual Framework for an Electronic Residential Complex

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Abstract—A residential complex is an interconnected group of buildings including residential units which are almost the same in type, size, design and view; built close to each other, and more important, managed centrally. A great amount of people are living in such places nowadays. Residents of a complex have certain interactions due to their rights and responsibilities. Furthermore, living together brings the opportunity to make their own social network and communicate. On the other hand, each complex has some interactions and communications with governmental and public organizations and service providers. Developing an online social space for residents of a complex, in addition to benefiting from the incredible facilities of Information Systems, would also be a specimen, for activities in a bigger society, i.e. e-city. This paper proposes a conceptual framework for an electronic residential complex, and explores its efficiency and capabilities for a better lifestyle of its citizens in future.

Index Terms—E-citizen, e-city, e-readiness, electronic residential complex, social online spaces.

I. INTRODUCTION

Nowadays Information Technology is becoming an omnipresent element in our everyday lives, especially in conjunction with management, surveillance, and the likes. It is permeated in all aspects of our modern life, as every day a new application of it is revealed to us. In most situations, this newly discovered advantage is in such a way that its necessity becomes an obvious regarding our near future, if not today.

A residential complex comprises one or more buildings containing residential units, together with the common areas and the immediately contiguous land that are reasonably a must for the comfort and enjoyment of the owners [1]. As a result, living in residential complexes means far more than just living close to other families. This new type of living has imposed new styles of living as well; for example, nowadays some residents enjoy their complex green area instead of going to public parks; many enroll themselves and their children in their complex internal entertainment programs and so on. Moreover, complex dwelling rights and duties are defined and registered precisely and as a result, residents are asked to observe the rules for their own comfort and freedom.

Among its many definitions, e-readiness is defined as a state in a society in which the following activities can be seen prominently: using e-mail as the most preferred medium of communication; using a website for internal and external communication; selling goods and/or services through the

Internet; and making travel arrangements using online Internet services [2]. Based on it, the author believes that the electronic residential complex as described in this paper is a quite suitable and reasonable start point to develop, practice and educate the usage of Information Systems and Technologies in everyday life – a prerequisite of e-residency.

II. E-READINESS

E-readiness is one of the most important tools to determine internal strength and weakness, environmental opportunities and threats [3]. It has a vast definition. One of the most acceptable is explored in [2] as bellow. The E-readiness Ranking Tool which was first developed by the Economist Intelligence Unit is the business arm of the Economist Group and the publisher of the Economist magazine. Since 2000, the Economist Intelligence Unit has regularly published an annual e-readiness ranking of the world's 60 largest economies.

This e-readiness assessment tool makes use of nearly 100 quantitative and qualitative criteria organized into six distinct categories, namely:

- Connectivity and technological infrastructure
- Business environment
- Consumer and business adoption
- Legal and policy environment
- Social and cultural environment
- Supporting e-services.

The e-readiness ranking of nations, which has been a regular undertaking by various agencies since 2000, demonstrates that the world is, indeed, moving steadily into a new digital era.

Internationally, the phenomenon of e-readiness is regularly assessed by various agencies in government, academia, business and the NGO sector, and the results are then either published on an annual basis, or two years thereafter.

Globally, a number of countries have already attained significant levels of e-readiness, while others are at various stages of implementation. Countries that have attained significant levels of e-readiness are invariably situated in the developed world, and include among others, the United States, Canada, Singapore, Sweden, Japan, Finland, Britain, Norway and Australia. Most countries in the developing world are still striving to implement relevant infrastructures to attain levels of e-readiness sufficient enough to partake in the emerging global information economy [4].

On average, however, the tools measure the level of infrastructure development; connectivity; access to the Internet; applications and services, or network speed; quality

of network access; and ICT policy. The tools also measure:

- The ICT training programs in place
- Adequacy and availability of human resources
- Level of computer literacy
- Relevant content.

III. EXISTING PLATFORMS

By offering web based Information Systems as a substitution for some residential activities, thus far, online spaces have brought forth new experiences to the owners and inhabitants of business and residential complexes. These can be categorized as:

a) Websites of building constructors, such as midfields (<http://www.midfields.com.my>). These are official websites of construction companies, which include general information of the construction company and the project details. Photo galleries and posters may be used to illustrate and promote the final result. Company's contact numbers and emails will answer the questions regarding investing/ renting/ purchasing units or show unit appointments.

b) Informative websites and weblogs, such as the borjmes (<http://www.borjmes.com/>). These are unofficial spaces which provide some informative off-line news, notices and articles about a specific complex. Usually created and run by one or more residents of the complex. They do not go far from some periodic posts, or change the subject and become personal blogs.

Many researchers have proposed various stages of web based activities. These stages revolve mainly around four phases, which are web presence, interaction, transaction and transformation. The transformation is the highest level of maturity for e-city and e-government programs, thus this is the most challenging phase [5]. The platforms mentioned above do not go further than the second stage.

In addition, so far there has been developed some total software solutions for helping residential complex management staffs. These include financial staffs, charge calculations, bill number registrations, and so on (<https://www.apnacomplex.com/>).

The framework will be introduced in this paper is about an official online, dynamic, and interactive space shared by all residents with an integrated structure and management, which reaches the third stage; transaction. The whole idea is derived from the service models of e-city and e-government concepts, and is a step prior, or a prerequisite to its establishment and to the transformation level.

IV. ELECTRONIC RESIDENTIAL COMPLEX

An electronic residential complex is an online social space, mapped to a real residential complex. It provides residents of the building 7/24 available offline and online services, regarding their dwelling rights and needs. This space can also be considered as a management tool and controlled by residents themselves. The activities can be defined in all C2C, C2G, and G2C fields.

A. Goals

The main goal is to get benefit of Information Technology

in management and practical affairs of a residential complex by transferring all possible residential activities to the cyber area.

The secondary goal is to minimize face to face contacts and organize related issues through a non-human party. It is believed that residents of today are from different cultures, levels of knowledge, and with various Information Technology capabilities. They are ordinary people who should become e-citizens someday in a near future, but they obviously show overt and covert resistances to any information systems, regarding to their lack of skill and experiences. A recent survey in 2009 shows that the reason of avoiding public e-services are %35 of inefficient services, %25 of inefficient awareness and abilities, and %10 of not trusting to the information systems, etc [6].

So through this electronic portal (senior) residents will get familiar with advantages of using advanced Information Systems in their everyday life, practice it and reach the point to rely on information infrastructures to do their duties and activities, and get use to going online to address their needs. Consequently, they will learn all these important points in the most effective way, i.e. first hand practice, in the lowest possible price. In this point, deploying this idea would be a great step toward the acquisition of the requisite e-readiness needed for the future of e-cities.

B. Features and Services

Many services can be delivered to the authenticated users of such a system, which are the residents. As a matter of fact, this platform can be a pilot for other web based services that are envisaged or planned for an e-city. Categories can be included but not limited to:

1) Communications

A routine activity in nowadays' residential complexes is to vote for a representative and the management committee, and also for changes in the constitution. There may be some notices about social activities, advertisements for rent/gadgets, reports from the management office and the likes which should be sent to each unit. In this platform, any user has an internal mailbox and will be provided by a list of neighbors, along with management committee, guard house staff and other employees for communicating. This mail box can be connected/ forwarded to the users' personal mail address for more convenience.

It is a usual thing today that residents often do not know their neighbors or can not manage a proper time to meet them when it is needed. In this case, offline communication will be useful and bring comfort and ease for both parties. Anyone can find their wanted neighbor by the unit number and send him an email directly in no time, regardless of who he is or what his phone number might be.

As mentioned before, this portal can be considered a shared place for complex residents and will include related and local news, such as Building News, announcements, notices, advertisements and etc. In this case, all users can participate, read and share their comments, files and news. In some cases, they may plan for outdoor meetings or indoor gatherings to enjoy, celebrate or mourn for particular occasions.

2) Offline services

In any residential complex there are certain shared data and information that relate to all residents. These often include records of meetings, comments, annual lists of building expenses, prices and so on and so forth. These are examples of offline information that should be available 7/24, plus a copy of rules and regulations of the building for owners and tenants. Notices regarding entertainments and cultural activities performed in the building can also be presented, and includes notices of yoga classes, art/Quran classes, and time schedule of study area, gym and swimming pool.

A directory of emergency numbers (such as the guard house, police station, hospital, dental clinics), nearest public services, fast foods with delivery and the likes will be provided for reference and convenience.

Some other may like to present their job and advertize for their skills and specialties on this board. It is always useful to know a person nearby who is consultant; can fix PC problems; or translate French documents. Advertisements can be free or not, depending on the number of users and the fact that how large the community will be.

There will be a page for announcements. Some online forms and special boards may help in this way. This can improve the process of renting/buying units, or user's secondhand stuff like car, washing machine, or piano.

3) Interactive services

All internal elections, whether it is a voting for management committee or a survey on a plan to join a particular insurance can be achieved quite easily and fast on this platform. In this case, many decisions can be made online with only one or two clicks: Through polls, the management office can ask about the design of the green area, the new color of door for spring cleaning, or any single imaginable idea. Users can comment and discuss certain issues, or sign requests, they will feel powerful when they can express themselves, and will observe the final result when they see the outcome of polls.

4) External interactions

Each residential complex has certain duties and rights regarding governmental and private service provider companies. They include; declare and paying annual taxes and rates to the municipality; paying the monthly water, gas, and electricity bills; or telephone and internet service charges to utility companies; applying requirements of street lights, green area, and so, to the related companies; legal partialities and political activities, as many have representatives in local councils and governor's office. This would be a great step toward better governmental services regarding to [7].

These activities also flow in other side. The service provider companies can email the monthly charge bills of residents to their electronic addresses or to a central email defined in the site. As a first practical step to e-citizenship, e-complexes can link to governmental portals and banks as well as other private/governmental companies.

5) Financial transactions

With development of e-banking methods, an option will bring the user to the page where he can pay his monthly

mentioned charges and other expenses in cyber space. This includes rental fee (for tenants), monthly charges of the building and other services.

6) Entertainment

There are lots of group games and applications to run. Multimedia albums and galleries are other kinds of entertainments. It can also include a local digital library for residents, where people can share the books they have, write comments and suggestions about the book they have read. Other local cultural news such as the timetable of movies and local sport contests can be provided.

C. Technical Framework

Because nowadays many modern complexes have their own internal built-in LANs, this will reduce the deployment costs and increase security level as well as speed for file sharing. But the system can also be deployed on the Internet.

Fig. 1 shows the modular structure proposed for this framework. The whole solution can be seen as a 3rd party service, and other customization options can be considered. Thus any complex whether new or old, can get benefits from this integrated solution.

D. Considerations

Like any other IT project, the first expenses of deploying such a system or CAPEX would be a negative point for it. These include expenses of buying and customizing the solution, training, and an annual fee for web hosting and maintenance. But this could be negligible comparing to the facilities and the conveniences it offers, reduction of OPEXs, and also regarding to the total building costs.

Developing the whole system on an internal network will make it secure. But In case of using public networks like the Internet, as this website may contain real information about the residents and events, local security considerations should be hold carefully. Information will not be published publically and all users will have their own key or password to enter. The real names are not necessary to address, and neighbors can be called only by their own chosen names or their residential unit number such as "C45".

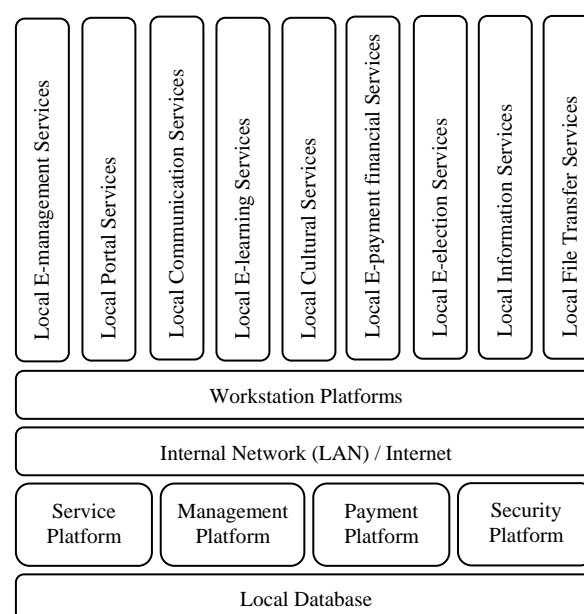


Fig. 1. The proposed structural framework for electronic residential complex.

It is important that only the resident should be given ID and password. The webmaster would preferably be a member of management committee or just one of the reliable residents with sufficient IT skills. He is responsible of authenticating the users in subscription stage, handling, managing, monitoring, and updating the website. The website should have Term of Services, including the penalty for possible damage and misuse, agreed up on by all users.

V. CONCLUSION

This paper proposes a conceptual framework for developing an electronic residential complex or e-complex. Keeping in mind the future societies, this idea can go one step further than an effective solution and be simply considered a must. After deploying such information systems for various complexes in an area, the connection between them can be envisaged, to cover all their pertinent needs. Many other facilities can be envisaged over this platform. Local groceries and stores can be linked to residents clearly for taking their orders and oriented marketing.

The author believes that the practice of such electronic complexes is a way to make e-governing possible, and a prerequisite level, should be experienced, before talking about e-city in its complete comprehensive definition.

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