**Association for Information Systems**
**AIS Electronic Library (AISeL)**

December 2005

# Using IT To Enable Ambient-to-Be SMEs

Olivera Marjanovic

*School of Information Systems, Technology and Management, University of New South Wales*

Follow this and additional works at: http://aisel.aisnet.org/bled2005

# Using IT to Enable Ambient-to-Be SMEs

**Olivera Marjanovic**

School of Information Systems, Technology and Management,
University of New South Wales, Sydney, Australia
o.marjanovic@unsw.edu.au

## Abstract

*Supported by technology, organizations are becoming more dynamic, adaptive and networked. A term ambient organizations is used to describe evolving organisational forms, enabled by integrated information systems that are designed to support customer-centered business processes and to enhance flexibility and knowledge sharing across functional and organisational boundaries. In ambient organizations, customers become the central focus and various strategies are implemented to involve them as "business partners" or virtual resources. This paper investigates ambient organizations within the context of SMEs (Small–to-Medium Enterprises) with the special emphasis on enabling IT solutions. It then illustrates the concept by an example of a service-oriented SME.*

## 1. Introduction

To remain competitive, businesses must evolve to become more agile and flexible. New types of Information Systems are designed to support the "business process oriented" view of an organization ad enable intra- and inter- organisational integration. Consequently, organisational boundaries are becoming more fluid to include suppliers, affiliated organizations and even customers.

*Ambient organisation* is a new term used to describe these emerging organisational forms. This is still a new concept and consequently definitions, models and frameworks are yet to be agreed upon. The following definitions all describe ambient organizations in different, but complementary ways. According to (Pouloudi, 2002) "the term *ambient organisation* refers to an organisation which, enabled by information and communication technologies, is exploiting the opportunities for meeting the increasingly complex, variable and even more competitive environment. This term has been chosen as a phrase that is encompassing issues pertaining to new organisational forms, such as, virtual organisations, networked organisations and flexible/agile/learning organisations and signify the importance of knowledge as their key resource…. It is referring to the third wave of e-business solutions addressing all business processes including customer relations as well as supply chains". Another, more generic definition is proposed by

1

(Bjorn-Andersen, 2003a): "An ambient organisation as a network of organizations that, enabled by emerging technologies, exploits virtual resources, communication and collaboration schemas and redefines its organisational structure and business model to create sustainable value". In this paper, we propose yet another definition that emphasises the business process view of an organisation. Thus, in this paper, the term *ambient organisation* is used *to* describe evolving organisational forms, enabled by integrated information systems that are designed to support customer-centered business processes and to enhance flexibility, knowledge sharing & creation within and across organisational boundaries.

Although ambient organizations are enabled by technology, IT is not their central focus. Rather, they focus on customers and creation of value-added, customer-centered, business processes. For the first time, opportunities are explored to involve customers as "business partners" or virtual resources.

Furthermore, it may appear that the concept of ambient organizations applies only to large organisations. Although SMEe (Small to Medium Enterprises) are, in many cases, more flexible and agile than large organisations, often they lack resources to investigate and implement innovative strategies and applications. Therefore, it is not surprising that the current cited example of successful *ambient to-be-organisations* are, in fact, large organisations such as for example LEGO, Amazon.com and CISCO (see Bjorn-Andersen, 2003b).

This paper investigates the concept of ambient organisation within the context of an SME. More precisely, it describes the initial experience of applying this concept to an Australian SME operating in a highly competitive service industry (health and fitness). The paper also analyses how IT can be used to transform a traditional SME into customer-focused, ambient-to-be organization through: (i) company sponsored virtual community (ii) personalization and recommendation of services and (iii) integration of independent services and service providers to enable delivery of personalised programs. Finally, the paper identifies some important issues related to the implementation of this concept in service-oriented SMEs.

## 2.    Ambient Organisations

*Ambient organisation* is an emerging organisational concept that many companies are likely to adopt in the future (Bjorn-Andersen, 2003). In fact, according to (Novitech, 1999) "Ambient organisations will become the flagship of information society this decade". Based on the currently available literature it is possible to identify a set of their main characteristics. Hence, ambient organizations are (Bjorn-Andersen, 2003a), (Pouloudi, 2002), (Novitech, 1999):

- structured around strategic alliances,
- provide agility and flexibility,
- enable inter-organisational integration and management,
- are customer-focused and
- are learning organisations.

As already pointed out, ambient organizations are made possible by Information Technology (IT), including both technical infrastructure and innovative applications. But at the same time, it is becoming clear, even from the very limited experience in this area, that ambient organisations are much more complex than traditional "brick and click"

businesses (or business with an electronic presence). They require a new way of thinking and new strategies that could be enabled by IT.

For example, in ambient organizations, IT can be used not only to support communication with customers or processing of their transactions. IT can be used to enable their involvement in company's business functions such as: product development, marketing, delivery of products and services as well as technical support. Obviously the concept of customers as "business partners" requires new organisational strategies that will make that happen. This also means that ambient organisations require different type of Customer Relationship Management (CRM) support than what is currently the case with most e-business applications today.

Furthermore, all customer interactions with an ambient organisation have to be highly personalized. To some extent, this requirement can be supported by IT in the form of various personalisation and recommendation systems (enabled by technologies such as intelligent agents). In fact, the increased need for sophisticated personalisation supported by IT, has resulted in a new related field called Ambient Intelligence (AI). AI is a combination of ubiquitous computing and so called "social interface" designed for individual users based on their preferences and personal characteristics. It makes use of mobile, embedded technologies and highly personalised interactions and services. Because of these characteristics, ambient intelligence is likely to become an integral part of ambient organisations in the future. However, at the present time, this field mainly concentrates on the technical aspects of personalisation (especially application of ubiquitous computing). On the other hand the concept of ambient organisations incorporates much more than the use of ambient intelligence (as described by the previous list of characteristics).

Finally, ambient organisations are learning organisations. This means that they are dynamic systems in continual adaptation or improvement with the main objective to learn from the accumulated experience. The role of IT support here is to enable continual accumulation and analysis of the relevant experience and in that way make the "feedback loop" between an organisation and its environment much more efficient. This, in turn, will empower organisations to react more quickly to any new requirements and conditions that are coming from the market or their customers.

## 3. Is an Ambient Organisation a New Organisational Form?

The existing e-business organizational forms and models such as *networked organisation*, *virtual organisation* and *company-sponsored virtual community* all have attributes of an ambient organization. This section investigates these organisational forms in more details.

### 3.1 Networked Organisations

Networked organisations involve multi-party cooperation relationships enabled by a dense network of IT communications designed to break through the four types of organizational boundaries such as horizontal, vertical, external and geographical.

Initially, the concept of the networked organisation was predominantly used within the context of a single organisation. The main focus was on intra- organizational integration of systems, resources and business processes. This integration was made possible by networked, process-oriented information systems (such as workflow) designed to support communication, collaboration and coordination across functional boundaries in an organization.

However, in recent times, the concept of the networked organisation has been extended to include inter-organisational integration with suppliers and other business partners. This is made possible by emerging IT infrastructure and standards (such as web services) designed to support cross-organisational business processes.

An example of networked organisation with strong focus on inter-organisational integration is CISCO For example, once an order has been placed on the website, it is automatically routed to the proper suppliers and manufacturers. The shared manufacturing schedule is also automatically updated. Members of Cisco Connection Online can also use this online system to check lead times, status of current orders and current prices online and reduce their reliance on call centers (for more details see (Wuebker, 1999) and (Bjorn-Andersen, 2003b)).

## 3.2   Virtual Organisations

Virtual organisations also focus on inter-organisational structures. Thus, virtual organisation is a temporary network of independent companies or business entities with a common business objective. Each organization retains its own identity but share a common business objective (such as completion of a project) or a common interest (such as sharing skills, costs, access to each other's markets and resources). Virtual organisational structure is likely to become even more relevant in the future, especially among small companies as they can experience the benefits of being associated with large organisations while retaining the agility and independence.

An example of a virtual organization, given by (CETIM, 2001) illustrates how development and marketing of a new product can be reduced significantly by shifting the project between Europe-, US- and Asia-based teams, thus generating a 24-hour working environment.

Obviously, virtual organisations have the attribute of flexible and agile like the network organization but they are much more dynamic. They enable dynamic and rapid formation of strategic alliances with known as well as previously unknown business partners. New technologies such as web services provide technical infrastructure necessary for dynamic composition of interorganisational business processes required by dynamic virtual enterprises.

## 3.3   Company-Sponsored Virtual Communities

Virtual communities have been increasingly related to e-commerce. When sponsored by a company, they become an additional function to enhance the attractiveness of a company's web site and provide new opportunities for B2C and C2C interactions. According to Turban (2004), the expected payback for organizations that sponsor online communities: increases in customer loyalty, sales, customer participation and feedback, repeat traffic to the site and new traffic to the site. Furthermore, "Internet communities will eventually have a massive impact on almost every company that produces consumer goods or services, and they could change the nature of corporate advertising and community sponsorship strategies and the manner in which business is done " (Turban, 2004).

Currently there are several different models of company-sponsored virtual communities. For example a company may place a banner ad or company's logo on the community web site to promote their business among community members. Another emerging model is used by companies that create the affiliated virtual communities and provide forums and chat facilities to allow customers to share their comments and reviews of the products and

services online. Comments and reviews are then analysed by the company. Examples of successful company sponsored communities are implemented by LEGO and Amazon.com. For example, in addition to collecting customer data, LEGO allows customers to develop their own website called "my Club Website" and upload their own LEGO creations. This is an example of customer-generated content that LEGO uses to explore ideas for new products. Amazon.com also collects data about their customers and creates customer profiles. These profiles are then used to personalise online store for each customer and recommend the most suitable products.

In summary, ambient organisations use the existing concepts of networked organisations, virtual organisations and virtual communities. In that respect, they can be considered as a hybrid of these three models but taken even further, towards an evolving, learning organisation with fluid organisational boundaries. All identified organisations: LEGO, CISCO and Amazon.com are examples of successful ambient-to-be organisations as they have implemented most of the identified characteristics (Bjorn-Andersen, 2003b). It is very well known that these are large organisations with resources and expertise required to implement innovative strategies and corresponding e-business solutions. However, this paper illustrates that it is still possible to apply the concept of ambient organisation to an SME, even with very limited resources.

## 4.    Case Organisation: UNSW Lifestyle Centre

During the 1990s, Australia became a service-based economy with three largest industry sectors currently being (in this order), Property/Business Services, Manufacturing and Finance/Insurance (Elliot, 2004). These sectors are dominated by large organisations and consequently they are currently the leaders in innovative e-business solutions.   At the same time, when it comes to e-business research and practice, the common view is that SMEs have been slow to adopt e-Commerce despite the benefits these businesses should be able to achieve. (for a summary see McGregor 2003). This is especially the case with service industry sectors dominated by SMEs.

Health and fitness industry is an example of a very competitive and fast growing service-industry in Australia largely dominated by SMEs and sole traders. In spite of a growing number of customers, this industry has been slow to adopt e-business solutions compared to other service industries. Apart from relatively simple e-payment and transaction processing systems, they are yet to implement more sophisticated e-business applications. In terms of on-line customer support, some health and fitness centers are now starting to provide chat tools and discussion boards to their members so they can share their comments or send their feedback to the company. So far, they appear to be under-utilised both by the customers as well as the companies.

The case organisation used in this research is the UNSW Lifestyle Centre. This organization has been selected because of their commitment to innovation through partnership with university and industry, as well as their strong customer-focus. This paper describes some results of the on-going action-research project started in 2004. The main objective of this project has been to investigate possible strategies that will help this SME to move towards an ambient-to-be organisation including design and implementation of possible IT solutions to support the chosen strategies (where applicable). The author of this paper was involved both as a researcher as well as a member of the company's advisory board and in that capacity had a very good insight into the project from the company's perspective as well.

## 4.1 Organisational Background

Although located at University of New South Wales' premises, the Lifestyle Centre is a commercial SME. Their main sources of revenue are memberships and fees for various health and fitness services they offer. Currently, they operate in a very competitive environment with a large number of similar organisations in their close proximity (within 5km radius).

This organisation was officially launched in June 2004 when the existing, long-standing UniGym was converted into a foundation Unit of the Lifestyle Centre. At the same time, two more units were added (Rehabilitation and Weight Management). When completed (mid 2006) this organisation is expected to have 6 units (departments). The Lifestyle Centre is governed by the mission to set national standards for provision of a balanced and holistic approach to lifestyle management, health and wellbeing though quality programs, research and strategic partnership with industry.

The Lifestyle Centre currently employs a relatively small number of permanent staff members and a large number of independent service providers (fitness instructors, personal trainers, physiotherapists, nutritional specialists etc.). The centre also collaborates with a number of affiliated organisations (e.g. local hospital, medical center, community college etc.).

Currently, majority of their clients come from the largest UniGym Unit. However this is expected to change in the future as other units start to grow their client base. In terms of their age group, their clients range from babies and their parents (enrolled in the learn to swim program) to senior citizens (in their eighties) enrolled in specially designed programs for that age group. A very recent survey has indicated that majority of their clients are computer literate and often use the Internet to find information about company's services.

The centre offers a very large number of face-to-face services and activities and number and types of these services are likely to grow in the future even more (especially when the new units become fully operational). Furthermore, through various units, the centre offers a number of personalised programs (e.g. rehabilitation program, weight management program etc). These programs are designed by the advisers that specialise in a particular area.

To remain competitive, the Lifestyle Centre aims to offer highly personalised services and programs. This particular strategy involves a number of challenges. First of all it is very important for the customers to find out which services would be the most suitable for them. It is not as easy as it may appear, especially for new customers or those with some special needs or conditions. Furthermore, when new services become available, even the existing clients need to be informed and educated about the purpose and benefits of each service including its suitability for different groups of clients. Furthermore, a typical program includes a number of different services and service providers that need to be selected, monitored and coordinated. At the same time, complexity of service coordination and integration has to be hidden from customers as they deal with their program advisor rather than a number of independent service providers. Consequently, the Lifestyle Centre has to make sure that they select the right service providers that will offer high quality services and not compromise the quality of the program offered to the customer.

In addition to personalised services and programs, another long-term objective of this organization is to help develop a strong sense of community among customers that will continue to use their services over many years and also bring new customers (friends and family members) through personal recommendations.

## 4.2   The Initial Steps towards an Ambient-to-Be Organisation

The initial steps towards an ambient-to-be organisation were motivated by the company's long-term strategy to focus on improved customer relationship management including creation of a community of customers. This is consistent with Bjorn-Andersen's vision of ambient organization as "customer-oriented organisations where customer intimacy, customer retention, product and customer segmentation and viral marketing (customers influence potential customers through stories of positive experiences with the products of the ambient organisation" (Bjorn-Andersen, 2003a).

Communities are created by people with similar interests and/or goals and they are usually informal. Obviously, creation of the customer community is a long process that cannot be controlled the management. Furthermore, provision of IT support (such as customer chat rooms and bulletin boards), in most cases, is not going to result in a virtual community of their customers.  So it was important to identify a potential or existing community among customers and then provide the supportive environment where people form communities of similar interests.

The core of this community of customers was identified among the existing group of senior members (senior citizens). They started as a group of less than 20 people, all enrolled in a single group exercise class offered by UniGym (before this unit was integrated into the Lifestyle Centre). Over the period of less than 3 years, with the help of their instructors, coordinators and members themselves, this group grew into a large group with more than 350 members currently enrolled in a number of different classes and using different lifestyle services. This group has taken an active interest in various events organised by the Lifestyle Centre (such as lectures and workshops) and member's committee in order to provide feedback to the management and help select new services. The initial survey of these customers indicated that majority of them are also computer literate or willing to learn how to use the Internet in order to benefit from online resources and support. So this was the beginning of an ambient-to-be organization. Although the initial focus is on the community of senior members, it is envisaged that in the future, the Lifestyle Centre will identify and support creation of other communities with similar interests (e.g. University staff members, parents etc.).

The next section describes IT support designed to help this SME to move towards an ambient-to-be organisation even further by enabling customer involvement outside the hours they spend at the Centre, using various services.


## 5.   Using IT to Enable an Ambient-to-Be SME

From the IT perspective, the overall main objective of this project were to design:

- support for customers so they can select and book individual services. This includes recommendation of suitable services and service providers as well as service personalisation.

- support for the activities of company-sponsored virtual community including at this stage, members of the senior community, instructors, coordinators, management, service providers and affiliated organizations)

- support for the program advisors to select individual services and their providers, integrate them into a personalised program for a particular customer, monitor program realisation and, if required, change the initial plan by selecting new or changing services and service providers.

This paper describes the first two objectives (due to the space limit) and illustrates the complexity of the third objective. Development of the support for program advisors is currently in progress. The details of this project are described in (Marjanovic, 2005).

The first phase of the project has resulted in development of the initial prototype of the Lifestyle Centre Senior community portal. Rather using B2C and C2C e-business model, this prototype is based on a combined model, here called C2B2C – as depicted by Figure 1. This model emphasizes the strong link from "C2C" back to "B" in a form of explicit and implicit feedback loops enabling customers to get involved in company's business. The "explicit" feedback is the feedback that customers send to the company directly such as surveys, comments, suggestions etc. The "explicit" feedback includes customer's activities, their selection of services, resources posted etc.
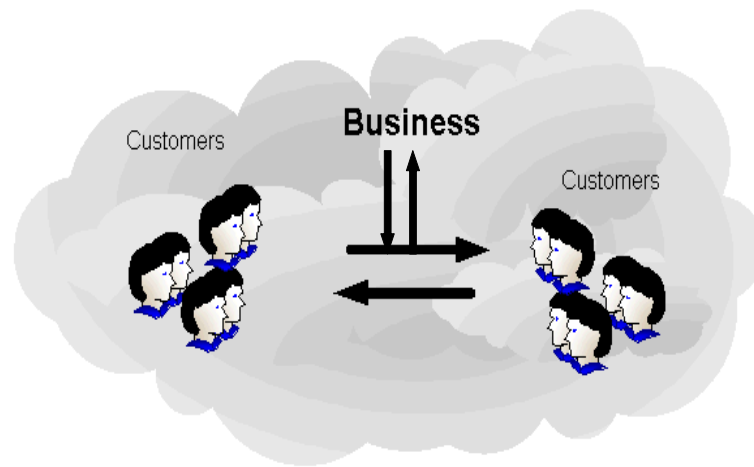


*Figure 1: A "C2B2C model" representing customers' involvement in business*

At the core of the Senior community portal (depicted by Figure 2) is the proprietary recommendation system. This system enables selection of personalised services and through its input and output supports customer's virtual community and service integration.

The diagram shows a layered architecture with the following components from top to bottom:

User → Presentation Layer → Communication and Coordination Layers → Application Logic (containing Profiling Module and Recommendation Module) → Data Access Layer → Data Base (User profile, Choice Set)

*Presentation Layer* – This is the web interface used by both categories of users: members of the senior community and administrators.

*Communication and Coordination Layers* – They receive requests from the Presentation Layer and resolve them into calls sent to the Application Logic.

*Application Logic* – It supports execution of requests such as insert or new records (e.g. new discussion message, new e-mail or new user profile), update or delete the existing records.
*Recommendation System* – It contains the user profiling module which takes in the user request and then analyses the contained data in building or updating user profiles; It also contains the recommendation module which generates content based on the information from the choice set and user profiles.

*Data access Layer* –links the actual web application with the backend database

*Database component* – It includes the choice set (a set of available services and their providers) and user profiles (generated on the basis of user's actions)
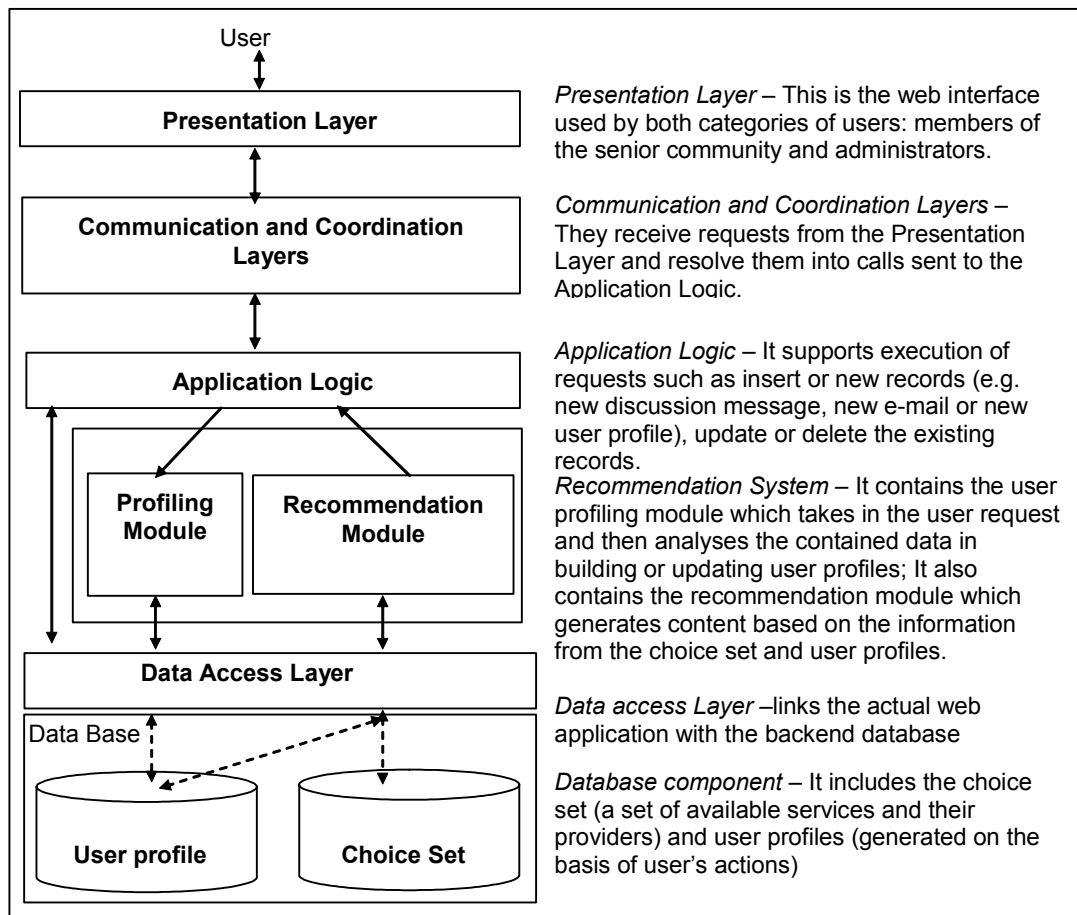
*Figure 2: Architecture of the Senior Community Portal*

The initial prototype was developed in 2004 by using the ASP.NET starter Kit extended to include the recommendation system on the top of MS SQL server. We are currently implementing a more advanced version of the initial prototype to incorporate the improved recommendation and user profiling modules as well as web service technology to make it more flexible.

The basic functionality the Senior Community Portal can be described as follows:

- *Membership registration:*

  Customer's interests and preferences are captured by the member registration form. This is then used to create the initial version of customer's profile.

- *Discussion forum*

  It enables customers to share their ideas and post their comments as well as the links to articles and other Internet resources that may be of interest to other members. From the business point of view, discussion forum is used as an implicit feedback to find out about customers' preferences without explicitly asking them to fill in surveys or other forms. Also, every time a member posts a message their profile gets updated.

- *Voting /rating*

  Each customer is encouraged to rate the service they have used as well as service providers. This information is not made public (for other members to see) but can be

communicated to the management if a customer wishes to do so. This information is stored in the customer's profile and later used to provide recommendations for other services to members with similar interest.

- *Selection and booking of services*

  Every time a customer books a service, this information is also stored in customer's profile. This is then used for future recommendation of other services.

- *Various reports*

  Statistics of the user information and the website activities are generated online for the administrators to view. With the help of these reports, the management can find out what enhancements or improvements are needed to better satisfy user's needs. An example of such report includes: "The most active member the senior community". Such information can be then used for the various reward schemes that recognise their activity and loyalty to the Lifestyle centre. From the perspective of an ambient organisation, this reporting function supports continuous organisational learning and imrovement of their services.

- *Personalised advertisements of services*

  In addition to the services offered by the Lifestyle Centre, it is also possible to advertise products and services of the affiliated providers (e.g. community colleges in the area, local library etc.).

- *Service recommendations*

  Based on the customer's profile, the system generates recommendation of services (including classes, seminars) as well as possible programs (a combination of classes and other services) for customers. However, the actual programs are not designed by the customers (only recommended to them).

- *Access to various electronic resources*

  Links to various electronic resources (newsletters and electronic magazines) are posted by the administrators. Customers can add their comments and opinions. Furthermore, every time new article becomes available customers are notified based on their profile.

The recommendation system enables customers to select and personalise *individual* services. However, it is important to point out that there are some limitations when it comes to service composition by individual customers that need to be taken into account. For example, customers can select and enroll in different classes however, they cannot design personalised lifestyle programs by selecting and combining different services. This is because such activity requires professional expertise and can also have possible legal implications. Thus, service composition is done in collaboration with the Lifestyle Centre advisor through an appointment that may require some specific tests that can be done only under professional supervision (including medical clearance that needs to be obtained from a medical practitioner).

From the IT perspective, support for service integration for an adviser is designed as a separate application module that complements the recommendation system (it also uses customer's profile). This so-called integration system is designed as a generic solution that enables service providers to easily describe and register their services and program advisors to select, integrate, coordinate and monitor programs (made of a number of services). Implementation of this generic system is currently in progress. The current version uses a proprietary component-based workflow system as an integration platform. The details of this system are reported in (Marjanovic, 2005).

## 6.    Discussion

The initial feedback from the management after the first phase of this project, suggests that the implementation of the senior community portal will enable the company to include their customers in company's business as virtual resources. This has potential to bring more customers in the future. In addition to its business value, this portal has additional value for the wider society as it links senior members of local community and encourages them to lead healthy lifestyle.

Furthermore, although this particular example combines the existing models available from the leading ambient-to-be organizations and apply them to SME, there are several interesting issues that have emerged as specific for service-oriented SMEs.

*   The Lifestyle Centre is a service-oriented, "brick and click" organisation and in that respect significantly different from online companies (such as Amazon.com). Thus, all services are offered exclusively in the "face-to-face" mode rather than online. So the main objective of this portal is to extend the interaction with the company and other members beyond face-to-face contact. At the same time, it is even more important that the company continue to demonstrate the same customer focus when dealing with customers face-to-face. Therefore, it is very important to show to their customers that their involvement is appreciated and their contribution to business is valued. For example, this company often organise free events and workshops for both staff members and members of senior community. Therefore, the online presence of an ambient organisation has to be fully aligned with company's values, customer-relationship  approach and strategies as well as organisational culture.

*   The fact that services are offered face-to-face (customers can meet all service providers) raises another important issue that needs to be taken into account in this type of industry. Even though this company has a very strong customer focus, it is also very important to protect personal and professional integrity of their service providers. For example, it would be unethical to publicly post voting and rating of services and service providers on the members forum. At the same time, it is important to communicate this message to management and service provider. However, any public posting of this nature could be easily misinterpreted. That is why voting/rating had to be carefully designed and used for recommendation and personalisation purposes. This is very different from relative "anonymity" of service providers in virtual world such as in Amazon.com or eBay. This point also illustrates that features of technology (such as for example voting) that are so popular in the virtual world cannot be easily transferred to the world where predominant mode of operation is face-to-face and trust is formed and reinforced through personal contact.

*   Rather than using a web site to form a community, in this particular organisation, it was important to first identify a potential community face-to-face and then design and use strategies to support, strengthen and extend this community through the senior community portal. In this process, commitment and involvement of staff members and service providers is crucial. However, this may not be applicable to other service industries (that offer for example one-of-products or don't have repeat customers). In that respect, health and fitness industry is very specific as it aims to provide ongoing services that customers can use over and over again, hopefully for many years.

*   In order to design personalised programs of exercises and rehabilitation, it is necessary to enable seamless integration of various independent service providers that may or may not have the required skills nor the existing IT infrastructure (including for example, booking and reservation systems).

Consequently, new, simple to configure solutions are required that will enable service providers to get involved without considerable time and money investment. At the same time, the company dealing with large number of service providers has to implement organisational strategies that will encourage service providers to get involved and adopt this technology.

Furthermore, some service providers can be associated with more than one company. They cannot be expected to learn and adopt different systems so they can deal with different companies at the same time. This raises an important issue of generic solutions and cross-organisational standards that need to be developed for this particular industry to enable "organisational mobility" of service providers.

Obviously, inclusion of external service providers makes the problem of security and privacy of customer data even more complex. For example when a new member is registered, a request for an appointment and medical clearance can be automatically sent to a local general practitioner (doctor).

By definition, ambient organizations have fluid organisational boundaries. However, every time customer data need to cross "traditional" organizational boundaries (defined by legal obligations and company's policies) the risk of potential security and privacy problems arise. Therefore, in the case of health and fitness industry, if any such integration system is going to be widely adopted, it is very important to establish consistent, industry wide, ethical and security policies to protect customer data from any possible misuse. While similar standards have been considered in the area of e-health, they are yet to be adopted for the health and fitness industry.

- The number of requests for personalised programs is expected to grow over time. So, program advisors will need more sophisticated system support so they can reuse previously designed programs and mine customer data. However, the main objective of any future support system is not to replace program adviser by an expert system (because of required expertise and associated legal and ethical problems). The main objective is to make their work more efficient so they can spend more quality time with their customers.

## 7. Conclusions and Future Work

The new term *ambient organisations* is used to describe evolving organizational forms supported by integrated information systems that are designed to enable customer-centered business processes and enhance flexibility, knowledge sharing & creation within and across organisational boundaries. In ambient organisations customers evolve into virtual resources and even business partners. So far this concept has been successfully implemented by several large organizations such as LEGO, Cisco and Amazon.com.

This paper investigates the concept of ambient organisation within the context of an SME (Small-to-Medium Enterprise). More precisely, it describes the initial experience of applying this concept to an Australian SME operating in a highly competitive service industry (health and fitness). Current and future work includes further investigation of the problem of service integration. It includes design of a *generic* service integration solution that will enable simple registration, coordination and monitoring of services and service providers (independently from the organisational context). As more and more SME move towards ambient-to-be organizations, the need for such generic solutions is expected to grow. But at the same time, further work is required to identify and address future organisational and societal challenges created by adoption of the concept of ambient organisations by SMEs.

## Acknowledgments

## References

Bjorn-Andersen, N. (2003a), Ambient Organisations, Centre for Electronic Commerce, Copenhagen Business School.

Bjorn-Andersen, N. (2003b), „The Role in IS in Shaping Future Organisation- The Case of Ambient Organisations", Keynote Session, 14th Australasian Conference on Information Systems, Perth, Australia, November 2003.

CeTIM – Center for Technology and Innovation Management (2001), Virtual Enterprise Lab Description (available at http://www.cetim.org/velab.html)

Elliot, S. „Impact of E-business on Banking: The development of ambient Organisations", School of Business, The Uniersity of Sydney.

LEGO Company'web site: http://www.lego.com/eng/

McGregor, R.C. (2003), „Strategic Alliance and Perceived Barriers to Electronic Commerce Adoption in SMEs', Journal of Systems and Information Technology, 7(1):27-47.

Marjanovic, O. (2005), Process-oriented CRM Enabled by Component-Based Workflow Technology", to appear in the Proc. of the 18th Bled eConference: eIntegration in Action, Bled, Slovenia, June 6-8, 2005.

Novitech (1999), „Why p-Business Ring", in Novitech New Information Technologies (available online from:
http://www.novitech.sk/eng/white_pages/why_p_business_ring.php)

Pouloudi, N. (2002), "Partnering for Ambient Organisationsof Excellence – AmOrE", CORDIS FP6, EOI.FP6.2002.

Turban, E. (2004), „Electronic Commerce, A managerial perspective", Prentice Hall, USA.

Wuebker, R.(1998), Cisco Systems: The Internetworking Company of the Future, Institute for Technology & Enterprise (available online from:
http://www.ite.poly.edu/htmls/Cisco_case_3.html).