Virtual Internet Service Provider: Be Small and Act Big

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Introduction

The way of life has changed with the introduction of Information and Communication Technologies (ICT) in every one's day to day activities and the business. As ICT technologies are constantly evolving, many people attribute the success of enterprises to the ways they deploy and take advantage of new technologies, not only to make their operations more efficient but most importantly to refine and adopt new effective and adaptive business models. Since the advent of the Internet and the very first Internet Service Providers (ISP) in operation, the traditional ISP market has been in constant evolution due to the gradual globalisation and commoditisation of ISP services. Deregulation and ICT policies have fostered competition (e.g. unbundling of the local loop and so forth) as well. The Internet is as an important channel of interaction inside and/or outside enterprises. The essence of the Internet is conducting business and running of business processes over data communication networks based on non-proprietary standards. The World Wide Web represents a major communication platform accessed through communication channels provisioned by network and service providers (such as ISDN, DSL, WLAN, UMTS, etc..). There are many challenging aspects of the eBusiness that must be considered for a sustainable business of an ISP. Among such significant aspects the following have to be taken into consideration:

1. The impact of business globalisation: most organisations are coping with the globalisation of the economy and the importance to be present at many markets.
2. The introduction of new communication technologies and channels forces organisations to revise the way they conduct business
3. The increased end user or customer mobility obliges organisations to propose tailored service offers adapted to new conditions..
4. The digitalisation of the entire economy is represented by several interaction channels

Small and Medium size Enterprises (SME) being backbone of the national economy and creative business development, it is important to develop the flexible platform so that skills and expertise of SMEs can be used in the global business model, for competitive solutions development. This paper identifies the business models and business scenarios with such a cluster of SMEs acting as a Virtual Internet Service Provider (VISP)

Background

The concept of Virtual ISP may have very different meanings since the virtualization can be perceived from very different points of views. In the context of this paper Virtual ISPs can be considered as monolithic business entities that sell wholesale services, - e.g. they sell hosting, access and applications services (e.g. DNS, e-mail, etc) - to customers that want themselves to become ISPs and just have to re-brand these services to sell to their customers.

VISP by concept is not new. A traditional VISP represents a web portal that can be reached through any access networks to reach variety of services and products available at the portal. Typical examples are Amazon.com, ebay.com etc.. which provide the platform to trade across a portal. Such portals manage business processes involved with a standard ERP and hence well controlled. These portals thus provide the brokerage platform to do business, and allow any third party to become supplier of services and goods. Such VISP models are not interesting for SMEs to enter into business when the profit margins are quite thin.

SMEs are facing the problem of providing tailored services to their customers in the context of increased complexity of Information and Communication Technologies (ICT) that require highly-skilled and flexible human resources that are difficult to acquire. Moreover, there is a very significant initial cost associated with back-office and front-office deployment for Internet Services Providers (ISPs) and especially for SMEs. In the competitive business scenario, the SMEs with suitable skills and know-how, can form the virtual organisation in the form of the cluster representing the virtual organisation, and provide tailored Internet services to suit to the market requirements. For developing tailored services, individual service blocks should be modular to facilitate creation of new services using such service building blocks. The challenge of Virtual ISP (VISP) is to specify, produce and validate an integrated platform able to accommodate these building blocks from their specification up to their deployment in a production network. Of course, one of the most important functional requirements is that there should be the possibility for dynamic adding, modifying or removing building blocks from the VISP platform.

To address such a challenging objective, a research project named VISP has been launched in the European Research Area (ERA) framework. The platform(s), idea(s), tool(s) and solution(s) created and developed as artefacts of Virtual ISP (VISP) project that is being realized within the European 6th framework, will enable a cluster of SMEs to collaborate and operate as a single business entity for producing tailored Internet Services adapted to local business needs. In other words the VISP concept described in this document consists primarily in virtualizing an ISP from a cluster of partners that behaves as a single business entity and will allow selling tailored (individual) services to business customers.

The project web site (www.visp-project.org) will provide detailed description and early results of the project.

Main focus of the article

Identifying internal organization and business model appropriate to a "Virtual ISP" acting as a "cluster" of SMEs operating as a single business entity for the production of tailored ISP services adapted to local business needs" is certainly a challenge.

Developing such a portfolio of tailored services can consolidate the future of existing SMEs but can also be at the same time a considerable challenge, and a significant barrier to the creation of new SMEs. Although many SMEs leverage on specialized ICT skills, they are generally isolated, hurdled by the complexity of services and they cannot afford the cost of setting up an integrated professional Business Support System (BSS) and Operation System Support (OSS) environment able to support a multitude of small individual services.

For instance, rural areas in Europe and more particularly in new entrant countries are populated with ICT SMEs that have their own individual value but they cannot afford to provide complex and/or integrated tailored services.

SMEs have three main characteristics differentiating them from large entities, and they are of paramount importance for this project: they operate on a local market with a network of close partners in their neighbourhood; more flexible and more reactive; and have lower operational costs. To create a VISP cluster involving such SMEs by providing a flexible and cost-effective e-Business platform is the real problem to be solved. The VISP project will solve these issues by developing a dedicated software platform integrating both the BSS and the OSS environments, allowing the implementation and provisioning of tailored services.

In such a virtual e-Business world, any **local and small** community of companies (cluster) can act as a **big** monolithic organization, potentially able to reach many customers across geographical and time zones.

There is growing demand on the market for increasingly specialised, complex and individual services. VISP will specify these tailored ISP services by combining customisable service building blocks selected from a set of a few hundreds of available atomic services (building blocks). Thanks to such approach it will be possible to provide to each customer the most appropriate individualised services and in the consequence it will allow small ISPs to differentiate themselves from their larger competitors and the incumbent operators.

The business workflows required for a cluster of SMEs based on the existing set of building blocks that has been specified and published as the part of the automation of business processes among business entities in the Supply Chain Management cycle form the core innovation of VISP as an enterprise of collaborative partners. The innovation includes service ordering and implementation processes as processes that can also be decomposed and modelled into workflows. These services are highly evolutionary and the corresponding workflows require an integrated and standard way of being specified and implemented so that when a service has to be modified or added, the implementation effort is minimal and automated as much as possible. The ability to organise, distribute, coordinate and automate service implementation and provisioning is a key aspect for the operations of a virtual ISP.

Both commercial and open ERPs use XML in developing the structured transactions across the systems, and are considered as a backbone in transactional communication world. Web services are very well used for the transfer of data in a distributed business

process environment (with SOAP request/response). Typical VISP model will have 'n' number of partners each using a particular type of ERP platform and processes (e.g. IBM, SAP, ORACLE and Open source ERP). VISP to be successful as an enterprise the transactions across these multi-vendor (vendor-neutral) platforms should interoperate in a seamless way. Web services provide a way of streamlining Enterprise application integration (EAI) across the partners. Improved version of web services for enterprise integration known as 'Service oriented architecture (SOA)' is adopted in VISP in developing VISP platform. SOA takes into account the issues of latency, security and service management issues in formalising the business models of VISP type of enterprise. With SOA, VISP can reduce number of proprietary interfaces, and change the partners dynamically in changing Business models, as all systems are supposed to communicate using SOAP. SOA provides the company management, power to make IT conform to its wishes and not the other way around. Business managers can act according to strategic mandates without the constraints of IT. As a result of such activities, VISP will build an integrated and automated software platform comprising a modelling environment linked to a distributed, secured and manageable workflow execution.

VISP Initiative

In order to compete against large ISPs, smaller ISPs can combine their strengths and efforts to form a cluster that could extend significantly their individual value proposition in order to reach the customers. The concept of clustering is a good enabler for an evolutionary path of the small ISPs towards better and stronger positions.

For any company of cluster, the appropriate manner to reach the best position in the marketplace may follow different paths. Whatever is the business model, the positioning in the marketplace is influenced by two key factors: the business opportunities and the technology advances, as depicted in the figure 1 below.

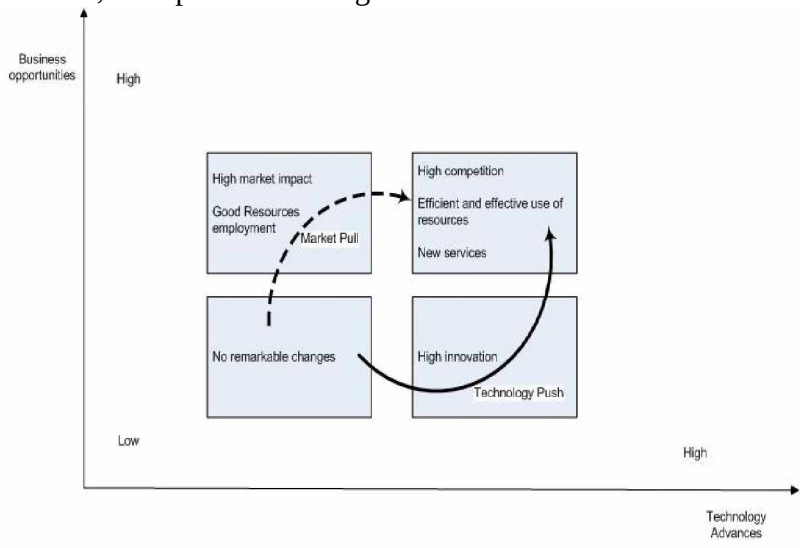

Fig 1: Business Opportunity versus Technological Advances.

In the case of a cluster, this requires the understanding the individual competitive position in the marketplace of each partner in the cluster in order to derive the aggregated competitive position of the cluster itself. In the figure 1, the best position is to be directly

located in the upper right quadrant. However, not all companies or clusters are originally in this position and each has to follow the path that is feasible and more convenient for it.
One path is based on the "Market Pull": This implies that business opportunities should already exist, and only when a higher market penetration is reached, the development of the new technologies will start.
The other path is based on a "Technology Push": this aims to achieve a high technology improvement assuming that the market opportunity will follow as its direct consequence.
To meet both existing and new demands, an important VISP mission is to deliver a combination of standard and innovative products in the so-called solution approach.
In this context, a comprehensive VISP Initiative has been proposed that tries to combine three different ongoing strategies: **the Volume, the Value and the Content** initiatives. Each strategy will map to a different business model. The drivers of the VISP Initiative will be based on strong effectiveness and future market applicability.
The three main successive strategies of the VISP initiative with their respective associated business models are:

1. **Volume initiative**: a volume strategy with a Direct to Customer business model for the commodity services, i.e. with a low or non-existing level of tailoring.
2. **Value initiative**: a value strategy with a Full-Service Provider business model for complete "standard" tailored service solutions, i.e. for the solutions which are fully described and addressable by the VISP knowledge base.
3. **Content initiative**: a content strategy with a Content Provider business model and/or a Value Net Integrator - atomic business model for complex non-standard solutions, i.e. for those ad-hoc solutions which require significant human interventions like consultancy due, in particular, to the deployment of emerging new technologies.

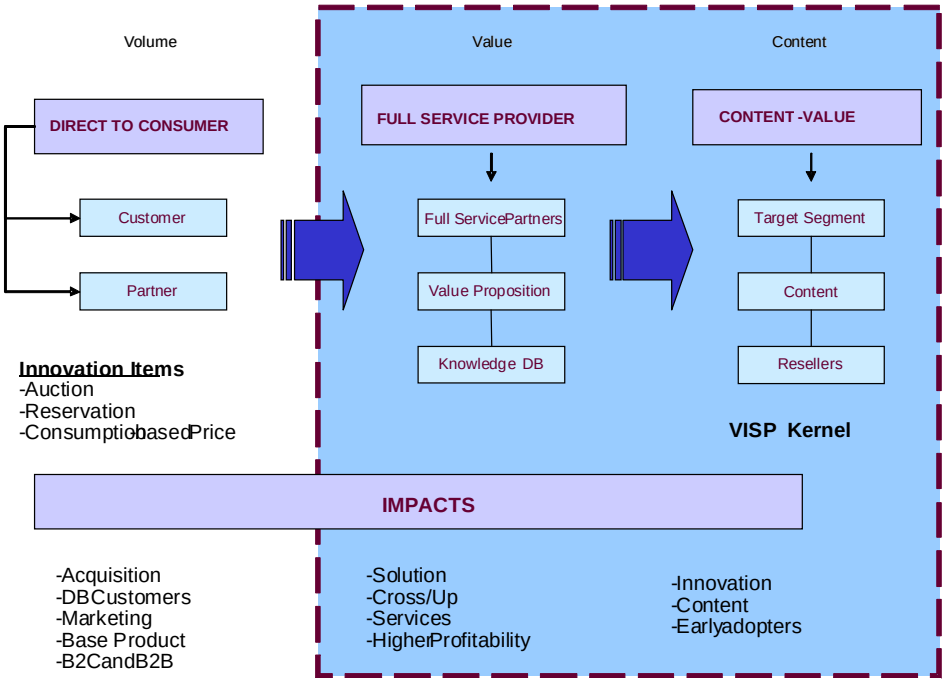

Figure 2: VISP Business Models

These initiatives are cumulative and have increased order of complexity. The level of service tailoring increases with the initiatives but at the same time that the level of automation decreases: moving from almost no tailoring at all but fully automated services in a commodity market, to the ultimate tailoring of the individual consultancy which can not be automated in the content-value market.

Volume initiative

The Volume initiative is the combination of a volume strategy with a Direct to Consumer business model. This initiative will be the foundation of the VISP initiative.
With this initiative, VISP intend to match customer's needs by supplying ISP commodity service with a very low profit margin and a quite high volume of sales. The services will only support a low or non-existing level of tailoring. This approach will require partners of the cluster to implement, in a first phase, an efficient mechanism to acquire new customers more rapidly in consolidated, new markets or emerging countries.
As illustrated in the figure below, the customer, owning almost perfect information about the items purchased, will not discriminate on details and characteristics but will pay a "market price" for the classic ISP services for which additional services could potentially be required. Ally in the figure defines an organisation whose products help to enhance the demand.

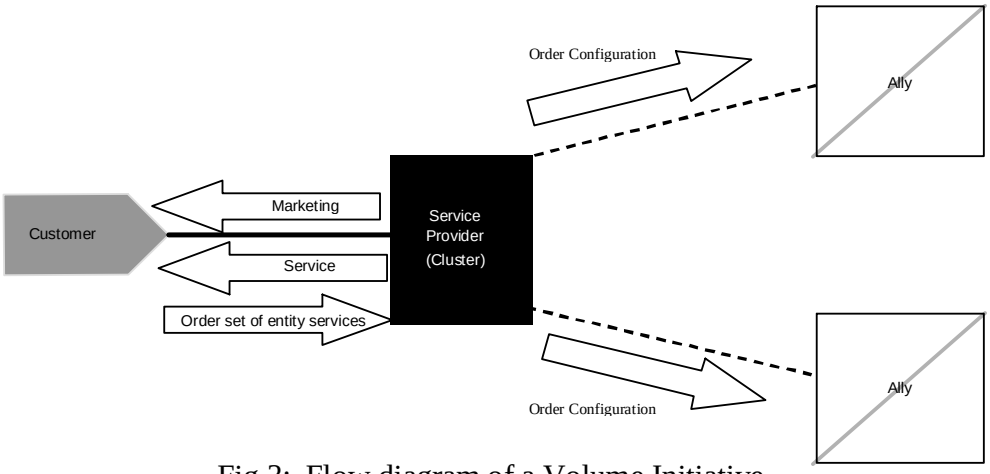

Fig 3: Flow diagram of a Volume Initiative.

With its specific focus on new customers, this initiative takes into account six basic actions that can create a unique way of selling the most standardised ISP services. The six actions of the initiative are:

1. **Most efficient and fast path to the customer**: The most efficient path to the customer is through a direct relationship, with no intermediaries to add confusion and cost. The activities of the initiative would be organised around groups of targeted customers with similar needs. This would allow the VISP cluster to understand the future additional specific needs of the customers.
2. **Build-to-order**: VISP will provide customers exactly what they want for the commodity ISP services through easy custom configuration and ordering. As a result, customers are provided with the best pricing and latest technology for features they really want.

3. **Low-cost leader:** The resources will focus on what matters to our customers. With a highly efficient VISP supply chain organisation, a focus on standard based technologies, solutions developed collaboratively with the concerned VISP partners, and a dedication to reducing costs through business process improvements, VISP will provide our customers with superior value.
4. **Standard service offering:** The services provided by the cluster will only allow a very low level of tailoring, or even no tailoring at all, as the Volume Initiative is addressing commodities. These services will be presented as "standard" solutions and if a customer would require a more tailored solution, the Value Initiative would be required.
5. **Standards-based technologies:** The proposed technologies are key to providing the customers with relevant, long term high-value products and services. Focusing on standards gives customers the benefit of extensive research and developments, flexibility and choice.
6. **One-to-One Marketing**: Ability to collect and store enormous amount of information that can be used to build up the tailored services.

This initiative would be exclusively implemented through a Web based sales channel and would result into a virtual enterprise. As long as the Direct to Customer model will flourish, the cluster would be able to attract the attention of new partners by enabling an Intermediary advertising based model where complementary partner candidates would be able to increase their visibility via advertising campaigns provided through the VISP sales channel against subscription fees. This would then enable the cluster to evaluate and select new cluster partners. The expected high volume of user traffic makes advertising messages of VISP partners profitable and ensures to sound business development. The combination of those Direct to Consumer and Intermediary atomic business models would ensure rapid sustainable business while contributing to attract more members in the cluster, which would coordinate their efforts to provide future specific services.
As the result, VISP will have strong influence on the market and the development strategies and the most important factors assuring such influence are as follows:

- Launching new product or service on the market will become more efficient and comprehensive due a large number of small agile organisations.
- Larger diversity of product evolving more rapidly at low cost.
- Localisation of partners of the cluster will become irrelevant; this will accelerate the international co-operation and intensify work mobility between market areas.
- Acceleration of product and service diversification and innovation by proposing various solutions to the market.

Once the current initiative is well established, i.e. when a sufficient volume is reached, the natural evolution lead into the next initiative that is more service oriented.

Value Initiative

The Value Initiative is the combination of a volume strategy with a Full-Service Provider business model. Internet Service Providers have a long history of commitment to service. The core of an ISP success is rapid response to the diverse service needs of the customer. The vision is to create an innovative strategy by enabling a Full-Service Provider model to provide "standard" tailored ISP services in order to offer a global market solution.

As the market was developed in a first phase through the Volume Initiative, the objective of this second phase would be to enable tailored solutions proposed by the VISP partners, thanks to cross sales to the customer and high value service quality. Achieving this objective requires the development of a network of complementary and fully trusted services partners, able to propose a full range of ISP tailored services.

The complete set of tailored services will form the so-called "standard" set of tailored services. Such services have to be smartly selected and structured (i.e. modelled) in order to have a coherent and consistent global set. This set will not be achieved by random but will result from design and modelling process.

The level of automation and communication within the VISP cluster of almost all partners, existing and new entrants would be lower than what individual ISPs might need to remain competitive on their own. New entrants will have new opportunities by developing their operations based on automation of critical processes.

With the growth of customer data or information services, it will become evident that the end customer perception of quality will require partners to expand traditional ISP offer by quality and to move towards a more proactive Service Management and interactive Customer Relationship Management.

Figure 5: Flow diagram of Value Initiative

Once the cluster will be in place, the essential issue will be the capability of the management of the virtual enterprise to operate a complex assembly of resources under control of many different and independent organisations. This is where the communication tools (workflows) will play a major role by:

- Supporting cross application processes.
- Transferring each activity for manual or automatic execution.
- Delivering the final services.

A critical requirement of such a cluster is to control that each partner fulfils its service contract. In this context, tools will be needed to monitor and control the service "quality" of each actor in the chain. Inside such a virtual community, one entity would typically organise and control the others. Such entity relies on an individual or a small group of visionaries that initially designed the services, and decided to launch them. It must gather a team of highly efficient specialists for:

- Designing the services or building blocks (i.e. maintaining the knowledge base).
- Designing all relevant processes required to support the services.
- Forecasting market trends to size the resources.
- Auditing the provided services in terms of quality.
- Helping and supporting the cluster partners.
- Providing key information to the customers, partners and to the cluster as a whole.

A large development and consolidation of the cluster (VISP community) will lead to a potential classification or specialisation of the partners (actors). In such context, a subset of partners would be keen to develop "content" based solutions for specific market segments which require complex ("non-standard") solutions.

Content Initiative

The Content Initiative is the combination of a value strategy with a Content Provider atomic business model and/or a Value-Net Integrator atomic business model. The combination of these two atomic business models is being here referred to as "Content-Value Net" business model.

The previous phase (Value Initiative) allowed addressing "standard" tailored solutions as the part of the VISP knowledge base. The Content Initiative follows the natural evolution to non-standard solutions, i.e. such ad-hoc solutions require significant human interventions like consultancy due to the deployment of emerging new technologies. This initiative will virtually cover every user's needs.

Innovation is the key differentiator in the ISP industry than in many other industries, but implementing tangible new emerging solutions is the real challenge. New technologies change the value proposition in a market. When they first appear, they usually offer lower performance in terms of the attributes that mainstream customers care about.

Figure 6: Flow diagram of Content Initiative

The early adopters of customer profiles are always looking for new technologies, which can create distinctive benefits. The few companies succeeding in implementing those new technologies focused mainly on proving the applicability of the technology in the customer context will be successful in such business models. The migration from Direct to Customer to Value Net Integrator model would take advantage of the potential strong branding generated through the use of VISP.
A strong cluster branding enables indeed each partner to be recognised individually as a cluster member which allows in turn these partners to sell content individually (based on emerging technologies or not) to target segments of customers, localised and adapted to relevant market needs.

Future trends

VISP business model has to live with existing legacy systems with changing technologies and new enterprise applications. As applications continue to evolve, many of the business processes supported by these applications continue to demand more complex application-to-application or business-to-business automation in real-time to be effective. As business processes become more complex, organizations are starting to recognize that having information flow freely through design, development and distribution needs a solid, consistent, and repeatable integration strategy. To keep pace with changing end-user expectations, businesses today are being driven towards more responsive, flexible and fully integrated business and service models.
The most successful business models today are those that are been able to develop new, automated and streamlined business processes in a competitive timeframe without having to replace existing operations (including legacy systems).
In developing an Enterprise Integration Strategy (the "virtual" ERP), organizations need to focus on the following issues that are of high importance:

- Maximum reusability
- Based on open Standards (XML, SOAP, Web Services, etc)
- Component based -- building blocks
- Service Oriented Architectures

The emerging approach today towards achieving complete system integration and inter-operability which is primarily dominated by multiple ERP systems and mission critical legacy applications, which must be modified and extended rather than replaced. There is a growing emphasis in the software industry on open standards to facilitate integration between competing ERP environments and other third party applications. Effective architectures using techniques such as the Service Oriented Architecture (SOA) depend on both Web services and component technologies to deliver savings through easier integration and re-usability. Both component strategies and Services Oriented Architectures (SOA) are key elements for cross application, enterprise- wide integration strategies that are both cost effective, progressive to start developing their integration building blocks. They will also allow for complementary methods for continuously extending applications through the development of re- usable modules and services. The VISP project is addressing these issues, and will deliver the software platform so that SMEs can join their hands in building virtual enterprises to meet the business needs as a function of continuously changing business opportunities.

Conclusions

The VISP project is addressing a challenging and ambitious objective of developing a software platform to build the Virtual Enterprises with clustered SMEs of complementary skills and expertise for developing tailored services to their customers. This will allow isolated SMEs to take benefit of the services provided by other partners and to develop new businesses. This will be based on decomposition of services in elementary building blocks and provide a consolidated set of realistic business workflows able to deal with business processes in a dynamic cluster of partners. These will be integrated in a common Open Source software platform. As an ongoing activity in the project, different business scenarios will be tested on the open source software platforms to validate in the project.

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Key terms and their definitions

VISP: Virtual Internet service provider
A VISP is a virtual enterprise made of a set of partners, which are independent organizations to provide Internet Services. Partners are independent because they have their own business objectives and they run in separate administrative domains.

VISP: Community operating mode (C-mode)
In VISP C-mode, each partner is the front-end towards its own customers and serves these customers with the help of other partners. The partner is the interface between the customer and the cluster that is used as a pool of resources for sub-contracting.

VISP: Enterprise Operating mode (VE-mode)
In thee VISP VE-mode, the cluster has a trade existence, i.e. it is a registered trade organization with for instance a registration number, a VAT number, etc. All partners who are part of this Virtual Enterprise share the revenues of the enterprise based on the terms defined in the agreement. Partners are typically shareholders of the Virtual Enterprise.

Enterprise Resource Planning
ERP (Enterprise Resource Planning) software attempts to integrate all functions of a company onto a single business process by automating the workflows so that the various different partners can more easily share information and communicates with each other. The ERP in the context of VISP is a virtual ERP with data sharing across ERPs of individual partners of VISP and is closed internally.

Service oriented architecture (SOA)
The Service Oriented Architecture defines the concept and methodology for design, development, deployment and management of a loosely coupled business application infrastructure. In the context of VISP, SOA can be good framework to realise the virtual ERP, involving multiple independent ERP systems communicating across them in the form of service modules.

Ally
Ally is an entity whose products and/or services help to enhance the demand of the VISP business.

Cluster
A collaborative group of interdependent entities functioning as a single virtual business enterprise.