KNetworks:

A contribute for its Conceptual Architecture

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Abstract — **Is there such a thing as an Atlantic Arch Community (or is there a potential for it)? This is a key question for the KNetworks project. Our view is that there is indeed, but its user base is scattered through the social networking landscape. Once scattered it doesn't have the capacity to represent its region and promote positive change and growth. The power of the crowds arises from the simple fact that, in a crowd, people see each other in a very well defined (content / time / space) context. Our goal is to show how to make alive the Atlantic Arch Community, within which individual and collective beings are not alone.**

Keywords - architecture; networks; networking; Knowledge, sharing, itegration, classification, authentication

I. CONTEXT

The 20th century was the specialist's century. Disruptive changes happened based on the lifetime work, discoveries and influence of specialists.

All major warps in society, technology and politics were driven by highly qualified and experienced people, from Einstein to the rise of Nuclear Power, from the Lumière Brothers to the invention of Cinema, from Bell to the phone revolution, from Mandela to the end of apartheid.

If we take a look at the 21st Century's first decade we face a very different scenario.

Take these as examples:

- Google, imagined and developed by Stanford students,
- Twitter, designed and developed by a 30 years old entrepreneur
- Facebook, created by a 21 years old Harvard student
- "The Protester" as Time Magazine's most influential person in the planet.

21st century relevant change agents are being driven by amateurs, emerging from normal people like you and me!

People like you and me, unleashed by technology to become globally influential as real time stakeholders in almost every process. Connected by social networks to build and engage powerful communities and supported by an unparalleled source of information, the web, to make complex decisions.

The Social Network melting pot will evolve dramatically in the next few years as context driven, user centric social apps will push their way, surpassing the authorization huge challenges presented by proprietary authentication and authorization mechanisms.

We should thus focus on people and organizations directing our efforts to connect with them using available and adequate authentication gateways, delivering, as a vortex, brokerage apps to build dynamic, context based, peer-to-peer interaction models. The essential ability is to provide natural and intuitive support to interactions - interaction being a simple thing that happens between people, between machines and between people and machines that, knowing their roles and perceiving their context, find a way to relate.

In the context of the KNetworks project, we must assume that the simultaneous coordination and real time synchronization of trans-European government efforts, political agendas, business needs, academic interests and personal goals is a possible task knowing, however, that there is no single technology, social network, content classification hierarchy or information framework that can accomplish it, alone, in a sustainable way.

The single-sign-on focus and the simplistic social networking platforms *panacea* can drive us out of track, lead us to consume too many resources and present no relevant results.

We should thus focus on the essential. And - I'm sure we all agree - the essential is not technology.

II. YET ANOTHER SOCIAL NETWORK

The essential is not to build "yet another social network".
In the past few years we've seen them (social networks) appear and disappear faster than we can acknowledge their existence. These appearances and disappearances are caused by (no) user interest and (no) participation.

When aiming to build a social network, we have to answer very simple questions [3]:

- What is the Value Proposition?
- What is the differentiation factor?
- Why should I use this social network rather than another?

The right questions usually lead to honest answers. And if we answer these questions with care, we are most likely to build a successful social network.

A relevant question in the context of KNetworks project is how to build a successful social network to boost KIS in the Atlantic Arch.

Having the creation of a permanent network of excellence as its major goal, could the KNetworks project assume the responsibility of building sharing and collaboration dynamics through all the areas that are essential for this network of excellence?

Any social network as an "agora", i.e. the common meeting place, is the end result of (no) user interest and (no) participation, thus subject to very rapid changes, driven by independent and autonomous, private and public initiatives of the many agents of our society, namely our companies, universities, research institutes, state entities and people.

As presented in the November 2011 Santander KNetworks seminar by Selyf Morgan; Adrian Healy; Laura Norris: CASS, Cardiff University[6] different membership types, user's objectives (value perception), application structure and objectives affect network operation.

We have, as KNetworks nurturers, to face the fact that (and assume the consequent challenge) Facebook, Twitter, LinkedIn, Pinterest, Youtube, Google+ and the small organization level social / work networks, are the shapers of the global social network landscape. And each one shapes it in its own specific way building a landscape that is evolving with the need for new responses to new problems as a set of useful and live layers comprising content, services, business and people.

Miguel Angel Pesquera's Serempathy[4] concept and Alain d'Iribarne's digital-to-smart leap[5], ask for increased flexibility, autonomy and empowerment to achieve innovation, subversion, creativity.

Based on these premises, KNetworks shouldn't be a part of the mentioned global social network landscape, but rather the user navigation layer through which the various now disconnected networks present themselves to its stakeholders as a coordinated yet flexible whole.

As a consequence, the intervention level of KNetworks should be at a higher level than implementation - yet assuring it (the implementation) can (and should) happen, based on its results, as a shared effort: the architectural level.

The essential, as we see it, is the design of a conceptual architecture that can comprise and synchronize very different dimensions:

- The IT dimension.
- The Data/Document management and classification dimension.
- The User context dimension
- The Authentication and Authorization dimension
- The Governance dimension

The focus of this deliverable is thus the proposal of a conceptual architecture for a user driven multiple-sign-on brokerage management platform to promote entrepreneurship, collaboration, employment, local economies development and inter-regional synergies, through people and organizations, empowering them to achieve their goals.

III. THE KNETWORKS AS AN OPEN SYSTEM

The design of an architecture that can work as the networked result of the present valuable networks which are being actively used by the users has to assume the need for adaptive control once processes and workflows are not owned or controlled by any stakeholder alone.
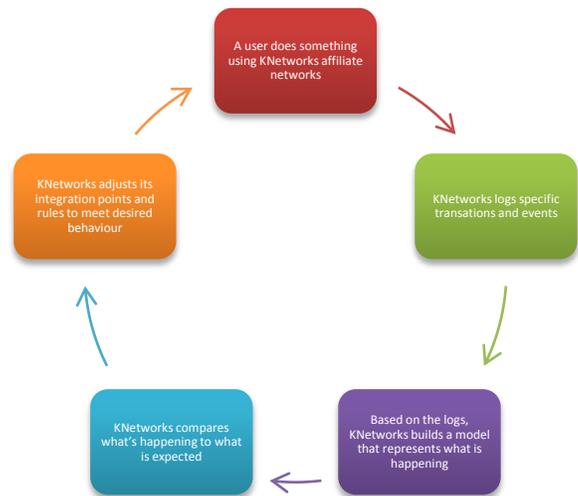
This doesn't mean that KNetworks can't have goals and meet desired behaviors. That only means that this control must be accomplished not by artifact and service control (these are controlled by each of the networks and active users) but by access rules and network integration requirements.

IV. A FIRST ARCHITECTURAL APPROACH

The need for abstraction and component isolation lead us to a conceptual design that introduces a governance layer to implement control over rules enforcement, roles, identities and authorizations, managing the identity universe and a feedback output based on observable actions performed by users in order to understand the behavioral possibilities provided by the networks SW artifacts.
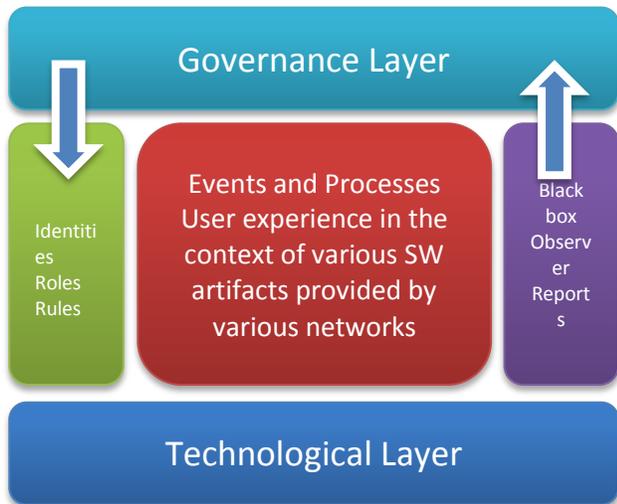
This basic conceptual design should be supported by a technological layer that is independent from the various technological architectures of the participant networks which provide SW artifacts in the KNetworks user experience context. This technological architecture should be responsible for cross network authentication, role management, context management and rules execution.

V. METHODOLOGY

Based on the 21st November contribute of Alfonso Bravo Juega (Fundación Universidade da Coruña) [1] , in what concerns the use of the Marco Logico Methodology, and considering the need for a well-defined and proven methodology for the definition of KNetworks conceptual architecture, we find self-evident that it can leverage the objectives of the KNetworks project.

VI. BUSINESS FOCUS

The actual global economic context and the associated challenges call for new approach to economic and social development. A network such as KNetworks can be a driver for innovation, entrepreneurship, collaboration, employment, local economies development and inter-regional synergies.

SME's are major actors in this paradigm change so we propose to give them a special attention for them to understand KNetworks as a valuable tool for business and Innovation.

Lead identification, Human Resources, Recruitment, access to R&D projects related to SME, services marketplace, (we thank Cardif for the two case studies shared in the KNetworks meetings[6]) needs and products catalogs, must be an overall bootstrap driver for the platform's architecture design.

VII. USER FOCUS AND INTERACTION CONTEXTS

The conceptual architecture must have the user (individual or organization) as its focal point.
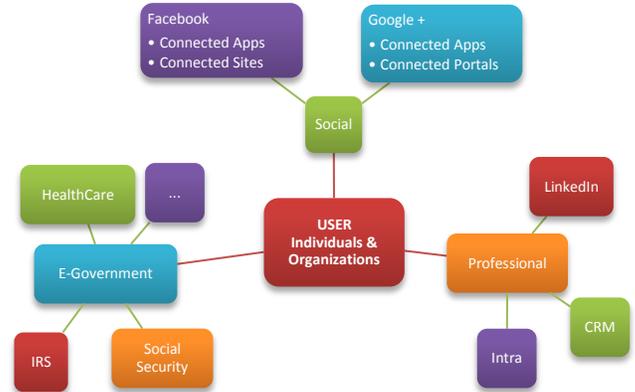
VIII. CHALLENGES

A. The Technological Layer

a) The technological architecture for KNetworks must be an integration oriented architecture.

b) It must implement single sign-on through various networks and provide complex rule management services that can encompass user, role, time, content, SW artifact and interaction semantics as one real time, measurable context for decision.

c) It should provide dynamic yet well-defined document management rules for content classification and integration ports for inter-networks document and content flows. This is critical because information retrieval must be possible by semantic search and user experience is highly related with information retrieval easiness.

d) It should provide contextual, automatic content retrieval and search to enhance sharing and interaction, based on complex user contexts. For instance, if I am unemployed, there is a great possibility that I can be interested in the same kind of content of a fellow unemployed European, regardless of content or semantic classification.

e) It should be able to log specific transaction and interactions monitoring real-time process building patterns.

B. The Governance Layer

Everything must be discussed in what concerns the governance layer.

Empowerment, constitution, rule definition boundaries, inclusion and exclusion parameters, integration rules for SW Artifacts and content classification.

C. Identity Management

A distributed social network must provide authentication for accessing protected content and to have a flexible support for user and access control list (ACL) management.

Identity management (IdM) systems aim to provide a unified and single service for user management across one organization, enabling several different services to leverage on a single authentication system and user database to perform user authentication. Federated Identity Management systems extend this concept by providing cross

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authentication services among different institutions, enabling different entities to share a common user authentication and management infrastructure.

In order to access protected or restricted content, the Knetworks front-end must provide authentication support based on an Identity Management subsystem with federation support. This approach will contribute to promote collaboration between different organizations and to provide the ACL and log capabilities required to manage, control and record the access to restricted contents.

The identification of global CRM and Intranet SW suppliers can bootstrap community growth driven by pre-made integration modules and private sector business needs.
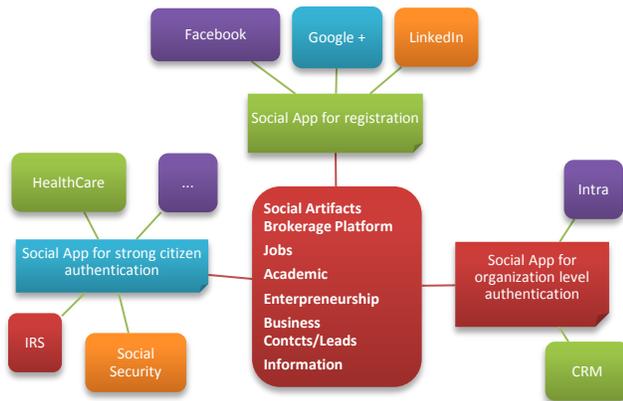
IX. OTHER CHALLENGES

We are sure to find other challenges as the architecture design evolves. Best practices, benchmarking and field experiences will help us identify and address them appropriately.

X. CONCLUSIONS

Social Networks are changing the world. Each one at its scale, but all have a role.

All (at least the successful ones) are supported in real needs and a user base recognized value proposition.

As a corollary, Social Networks exist themselves at an operational level, implement various degrees of liberty and are closely related with reality in a very volatile user and content landscape.

Inter-national networking projects as KNetworks shouldn't aim for operational level influence.

> KNetworks should be designed to be the social network landscape integration layer for the Atlantic Arch community.

Social frameworks in which use makes utility, architecture plays an essential role because only a profound architectural level intervention can provide these "yet to be known" social / digital complex and dynamic environments with long term integrated operation ability, sustainability and flexibility.

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