

**PERSONALIZED INFORMATION SYSTEMS: PERSONALIZATION, IMPLEMENTATION LEVELS A CONCEPTUAL FRAMEWORK**

**Abstract** - Personalized Information Systems (also named Personal Applications – PA) are software applications that exhibit personalized features, adjusted to the preferences or user’s needs. PA can provide benefits related to customer relationship or related to the efficiency of organizational work. This poster presents the personalization definition, the main personalization typologies, the personalization implementation levels, personalization variants/dimension and a conceptual framework for personalization that can be viewed as a contribution to the body of knowledge of Information Systems Technologies (IST) professionals with responsibilities in the adoption, and development of PA. These contributions include: a conceptual model that combines levels of personalization, levels of implementation and system integration of personalization with personalization variants/dimensions.

**Personalization and personalization typologies**

The main goal of PA is satisfying the needs and preferences of a person (or groups of persons) that use of a particular information system and facilitate the interaction among the various actors that cooperate within an organization, and the interaction with information providers and information recipients. Personalization it’s **implicit or adaptive/proactive**, if is done automatically by the system when, for example the system with a collaborative filtering technics discover that if a user likes music from Madonna also likes music from Beyoncé, because he have the some profile characteristics from other user that likes de same. **Explicit or reactive** if the user participates in providing information or making choices that will allow the system to adapt, for example if the user fills an electronic form with the type preferences in a book shop.

**Personalization and implementation levels** – On the assumption that a personalized company is based on the creation of a long-term relationship with customers, which in addition to the content personalized, personalization should include prices, products, shopping experiences and global relationships, **the model proposed by researchers is based on a set of five levels of personalization**, which increases the difficulty of implementation as they level up - see Table 1.

To be implemented, personalization needs software engines that automate and optimize the interactions between the customers and the suppliers in accordance with their personalized data; like that it is possible to adapt the systems to user needs. These mechanisms can be achieved through the design of systems with appropriate interfaces to users, with personalization and adaptation (tailoring) of interfaces and communication channels, and a dynamic adaptability of e-business services and applications. **The implementation of personalization can be done in phases with different levels, associated with each phase their level of integration of personalization in the information systems components** (databases, access control systems, content management systems, etc.), and the respective costs. For each implementation level there are actions associated with personalization, including the items referred on Table 2.

**Conceptual framework** – The personalization and implementation feature scales contain things in common. If we analyze and combine the information contained in these two models, taking into consideration what can be personalized in an information system, as well as the difficulties of personalization, we have the personalization variants/dimensions (**Interaction, Attributes, Contents, Interfaces, Products, Transactions and Relationships**). If we graduated the different variables in the models (cost, difficulty of implementation and integration) we get the personalization and implementation levels and the personalization variants/dimensions model represented in Figure 1.

Personalization levels	Description
5. Personalize relationships	<b>Personalize relationships.</b> One way to overcome the fact that only 1.3% of the buyers through a website return for repeat purchases, personalized the site can increase the number of purchases in each transaction, expanding markets and improving long term relations with customer (example: some airlines allow their passengers that have more frequent access to their favorite places, the meals tailored to their taste, a phone number where presumably take less time to be contacted).
4. Personalized shopping and consumption experiences	Through online technology, companies can "conduct" customers on an individual basis from the existing information on the characteristics of the profile (example: a typical supermarket has 20,000 products and a consumer only chooses from 200, the peapod.com allows a client to select from personalized lists of products and the customer can choose between only these selected products).
3. Personalize products	The combination of Web personalization with customization of mass production allows, for example, the personalization of computers (Dell, Computer Planet), sneakers (Nike, Puma), clothing (GAP, Levis), cars (Fiat500, Peugeot).
2. Personalize prices, packaging, support services, etc	Personalize types of discounts, shipping methods, specific packaging, guarantees or technical support.
1. Personalized content.	Associate digital content to non-digital components (example: a custom ring tone to a mobile phone) and non-digital personalized content to digital components (example: travel preferences for a hotel or a place on an airplane on a travel site marking).

Table 1 - Levels of personalization

Implementation levels	Description
Interaction	Conducted through IRC – Internet Relay Chat (for example: Google Talk, Windows Live Messenger, ICQ, AOL Messenger), private forums, e-mail and social networks, that may or may not be integrated with the databases of the organization and can be presented through browsers.
Content	Through customization the system allows the user to create a personalized desktop, selecting the options he want (for example, access to email, news, chat systems, research and reporting systems, weather, stock markets, personal agenda or the applications he want to access, etc.). The system must have an architecture that allows the structure of the screen is changeable according to user preferences creating a unique experience of personalization (for example: MyYahoo, iGoogle, NetVibes, My Excite, JuniorNet).
Content	Through a Content Management System - CMS - it is possible in a dynamic way manage the site or a Web portal content, with the aim of providing the most relevant contents for each user with an attractive way. These CMS-based systems require relatively powerful search engines, or sets of search engines that meet the requests/demands of users and they can customize these or define the form of presentation (layout) of the site. There are several systems with commercial applications that manage this content, such as Wordpress, SIRSI, Joomla, Drupal, etc.
Transactions	with different technologies is possible to obtain real-time recommendations, collaborative filtering, learning flows of clicks (clickstream) data (obtained through agents or bots), guides to support decision-making and advertising targeted/segmented (shown by motors that direct advertising according to user profiles). This level of personalization requires development of a high level of integration with other data types available in the system (examples: data inquiry, data about user profile).

Table 2 – Implementation levels

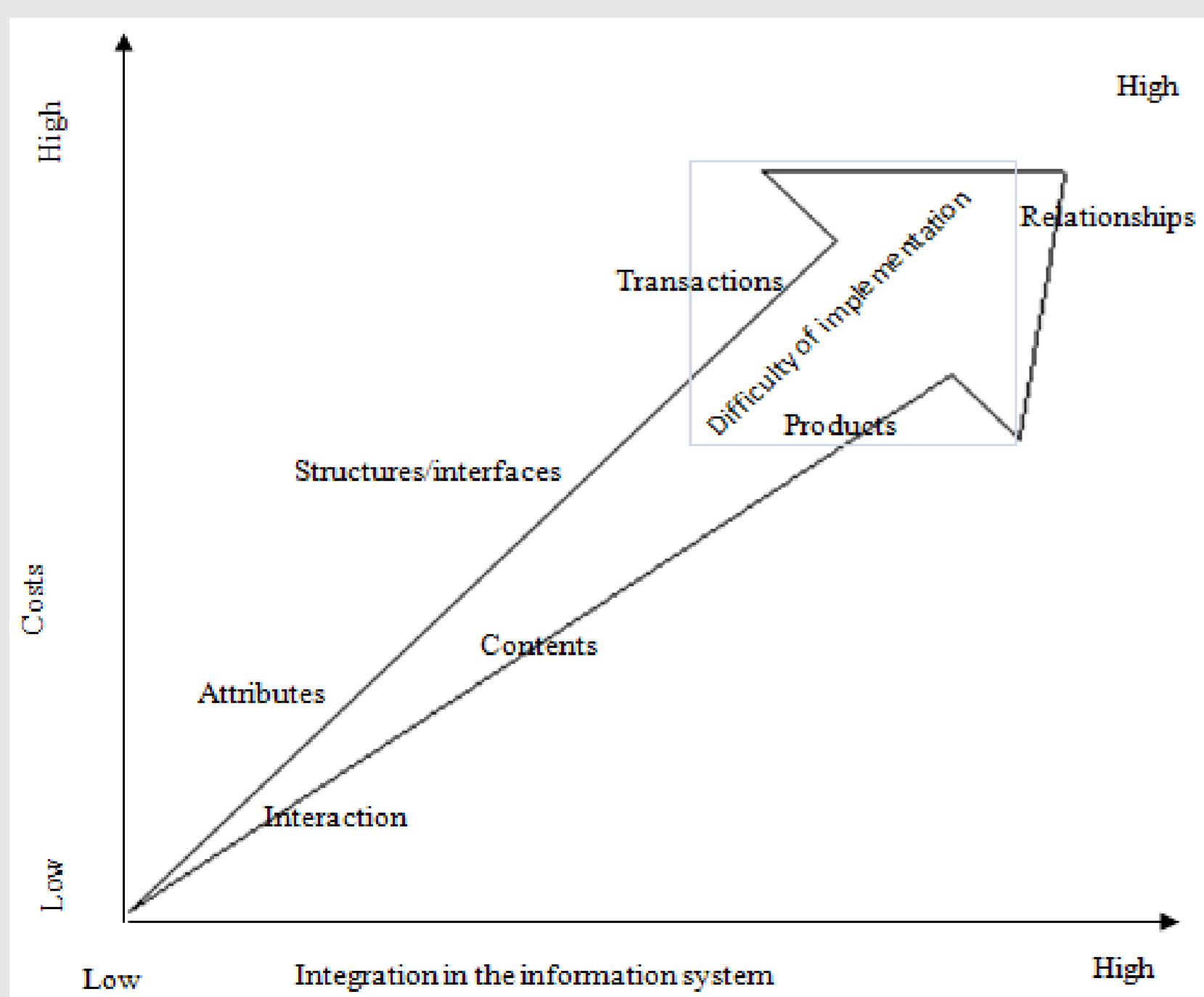


Figure 1 – Personalization, implementation levels and personalization variants

**Conclusions and Future Work** – The conceptual framework produced in this poster represent a synthesis of knowledge on personalized information systems dispersed by several sources. This dispersion is justified to the extent that such knowledge is the result of interest focused on particular aspects of personalization. One limitation of this work it is related with the fact that the technologies to personalized an information system and the correspondent architecture it is not referred. In another work it is necessary to elaborate the technologies framework.