Pioneers in the development of such methodologies were Ed Yourdon and Larry Constantine (1975), Chris Gane and Trish Sarson (1977), Tom de Marco (1979), and others. These methodologies, also called structured analysis or system engineering, clearly divide the system development process into two distinct phases: requirement analysis, which produces a logical model of the system to be developed, and software implementation, which concerns the development of programs, user interface design, testing, tuning, and installation of the application in a computer production environment.

While conceptual methodologies as structured analysis has its focus on processes, another pioneer, Peter Chen (1976) proposed the Entity-Relationship (E-R) model, a methodology which has a focus on entity, represented as an aggregate of attributes, i.e., data, and their relations with other entities. The E-R methodology is aimed at designing databases. Since then, conceptual modelling has been an important focus of research in computer science. The primary product of such methodologies is what was called the conceptual model, usually a graphical diagram.

Researchers as Guarino and Guizzardi (2006), Guizzardi (2005), and many others have emphasized the need that conceptual modeling should have solid ontological bases. Nowadays, many meetings and workshops focus on the convergence of ontology, conceptual modeling, and software engineering. Computer science considers conceptual modeling, including increasingly ontological analysis (Guizzardi 2005), as an essential phase of system development. There is also an increased use of conceptual models in KO, such as the FRBR model (IFLA 1998) and the CIDOC-CRM, as guides to the development of a KOS in digital environments. The development of a KOS in digital environments is a motivating factor to the adoption of conceptual modeling, incorporating the advances on ontological analysis and the formalism provided by computer ontologies (Giunchiglia et al. 2009) in the current KOS development.

The role of faceted classification as bases for a KOS on the Web has been emphasized by many authors including Denton (2009), Gnoli and Hong (2006), Priss (2008), Putkey (2011), Uddin (2007), and Vickery (2008a). This fact points toward a rapprochement between KO and conceptual modelling and the need to integrate faceted analysis within conceptual modelling methodologies (Prieto-Díaz 2003). A proposal in this direction is Poli and Obrst (2010), who suggest a framework for domain modelling comprising foundational ontologies, cross-domain ontologies, domain specific ontologies, and faceted ontologies within a domain, reflecting the various aspects of interest in a domain.

Once the basic ontological structure of a domain has been established—that is to say, once the levels of reality of the domain have been fixed—the subsequent step is to devise their dimensions of analysis. Here is where faceted analysis can best play its role. Maintaining our reference domain of biology, two series of facets follow. The first series is centered on the governing concept of organism as an individual whole and lists the "viewpoints" from which organisms so taken can be seen. (Poli and Obrst 2010, 15).

The second series of facets list all the other viewpoints, those not focused on the organism as a whole. These may comprise, for instance, genetics (focus on the genes), ethology (focus on some population of organisms), and ecology (focus on an entire ecosystem). But, again, this is not the entire story. A substantial number of other facets can and should be developed, concerning, for instance, the growth and development of organisms, their reproduction, or their alimentation. For each of these facets, appropriate ontologies can be developed. (Poli and Obrst 2010).

This position suggests that faceted analysis may be a modeling phase to be developed after ontological analysis and the definition of the domain core categories comprising the domain ontology. As a methodological phase, faceted analysis may thus indicate possible access points and issues related to the interface design phase.

5.0 Concluding remarks

Formal ontology aims at defining what exists, here and now, and it looks for ontological foundations of what exists. Moreover computational ontology and KO both develop methodologies to model specific domains; domain modeling is a basic, common activity to both disciplines. However the faceted analysis phase has a pragmatic approach to domain modeling, aiming at developing an efficient KOS to providing access to knowledge records.

KO cannot ignore the knowledge provided by ontology, as it reveals the ultimate nature of what does exists. If knowledge domains were not represented in an ontologically consistent way in digital environments, as stressed by Gnoli, computational inferences based on them will lead to inconsistencies. As knowledge is produced and recorded according to its nature, the properties and different aspects of how things exist are viewed or thought by users; so it may be accessed and organized accordingly. Ontology provides the methodological tools for modeling domains in an ontologically consistent way.

In conclusion, KO—faceted analysis—aims at identifying all possible aspects of a phenomenon which may be of interest in order to preview users' information needs. It always works with users' needs related to different aspects of a domain. The needs of contemporary culture imposes to KO that it must now develop KOS in digital