Automatic system adaptation to a continuously evolving scenario is a key feature of a full-fledged pervasive system, whose reactions should be guided, at all times, by the tastes and needs of the users. This part addresses the main methods adopted to solve this problem, that is, personalization and context awareness. Personalization is devoted to delivering to the users the knowledge that is most relevant for them. Since, in a pervasive system, different information and services may be differently relevant to the same user according to different ambient conditions, the notion of relevance acquires a dynamic flavor; as a consequence, personalization must take into account the different contexts in which users might find themselves.

Chapter 11 introduces the main issues related to personalization, that is, the construction of a user model that will be adopted by the system to adapt its behavior to the user’s tastes and circumstances. User models that have been proposed differ mainly depending on the goal of the personalization (presentation, interaction, content reduction, etc.) and on the features of the user that are interesting for the specific application (e.g., preferences, goals, traits, learning styles). A thorough analysis of the main techniques and methods adopted in the literature, and in real systems, will allow the readers to choose the most appropriate method for their specific purpose.

Context, as defined by Dey et al., is represented by the information that can be used to characterize the situation of any entity that is relevant for the system under consideration. Accordingly, context-aware applications and infrastructures support the users to weave their experience in their environment to give it meaning. Chapter 12 introduces the notion of context as intended in the various context-aware systems and proposes a methodology and a model supporting the design of a system delivering context-aware information and services. Moreover, some problems related to the maintenance and evolution of context-aware systems and to context-aware user preferences are introduced.
The ubiquity of mobile devices (e.g., smartphones and GPS devices) has in part motivated the use of contextual information in modern mobile applications. From one perspective, context in mobile systems can fall into three categories: (a) user context that includes the personal attributes of the user, e.g., spatial location and budget; (b) point of interest context, e.g., restaurant location, operating time, and rating; and (c) environmental context, e.g., weather and road conditions. Incorporating such context in applications provided to mobile users may significantly enhance the quality of service in terms of finding more related answers. Chapter 13 first gives a brief overview of context and context awareness in mobile systems. It then discusses different ways of expressing the spatial location context within mobile services. The chapter later describes application examples that can take advantage of various mobile context, namely, social news feed, microblogging (e.g., Twitter), and recommendation and preference services.

A topic in-between Parts IV and V, Chap. 16 presents the use of recommender systems for personalized multimedia selection and presentation.