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SmartHouse Code of Practice

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CENELEC

WORKSHOP

AGREEMENT

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English version

SmartHouse Code of Practice

This CENELEC Workshop Agreement has been drafted by a Workshop of representatives of interested parties and was approved on 2005-11-02.

The formal process followed by the Workshop in the development of this Workshop Agreement has been endorsed by the national members of CENELEC but neither the national members of CENELEC nor the CENELEC Central Secretariat can be held accountable for the technical content of this CENELEC Workshop Agreement or possible conflicts with standards or legislation.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This CENELEC Workshop Agreement has been developed through the collaboration of a large number of industry experts (see Annex E). Its final text was approved as CWA 50487 on 2005-11-02.

Preface

This Code of Practice is intended to provide a valuable reference for anyone involved in creating a SmartHouse, a house that has intelligent systems, intelligent equipment and networks and has services and applications that use the SmartHouse intelligence.

It has been put together from the efforts of a large number of industry experts. In order to cope with the very broad scope of the Code of Practice and the many stakeholders that were involved, it was seen as desirable that the document should be subdivided into Sections each of which covers a particular market segment in the service supply chain of services and applications to and within the SmartHouse.

Each Section has been constructed by a Section Editor who is an expert in the area of the section and overall editing and management of the project has been the task of an overall Managing Editor. Each Section Editor has had the assistance of a dedicated group of experts and around 160 experts have been involved in these working groups. Overall, there have been 4 Open Forums/Workshops attended by an average of 65 Experts for the first 3. Some 325 experts have been involved in the review process. The 10 section editors have worked incredibly hard with their experts to deliver the current text. The time recorded by the experts now adds up to more than 600 man days.

There have been numerous disagreements as to what should be in the text and what left out. These have been resolved although some hard decisions have had to be made. There is now agreement on the text and all the comments received have been resolved and put into the document

Because there is significant variability in the scope of the sections, some sections deal with hard physical facts whereas some deal with the objectives and needs of stakeholders such as the consumer and the service provider. Other sections deal with entities where the market is still evolving and therefore the hard physical facts are not readily available. Therefore, while there has been considerable attention to ensuring consistency, there are areas where there is overlap, because the sections lie side by side on the service supply chain, and some sections look at similar issues from different perspectives.

An example of this is the way in which we have used the term “cluster”. In each section where it is used it describes a broadly market segment grouping but is used in a slightly different way and although the market segments are broadly similar, in some sections the market segments are sliced more thinly.

Overall, it is considered that this document will provide a most helpful document for the stakeholder of the SmartHouse market. It is hoped that the Code of Practice will bring understanding of the issues and in particular allow the system designer of the SmartHouse to work more effectively and with more understanding of the wider issues.

As managing editor, I would like to thank all the section editors and their teams of experts for the help and support they have given me in putting this Code of Practice together.

The document has been approved unanimously by experts in a CENELEC Workshop and by experts from previous workshops who have reviewed the document and indicated their approval by mail (See E.1). The Chairperson (Stephen Pattenden) accordingly decided that consensus had now been reached and the document should be adopted as a CENELEC Workshop Agreement.

Stephen Pattenden (06/11/2005)

Acknowledgements

In certain parts of this Code of Practice organisations and companies and their products may be mentioned. In all cases where used the names of any product and their trade marks are acknowledged as belonging to them and have been used where appropriate to illustrate particular concepts or the common usage of such products.

Disclaimer

Every effort has been taken to ensure the accuracy of this Code of Practice, however, in a document with such a broad scope and with multiple experts and authors, neither CENELEC, nor the Editors and experts involved in compiling this Code of Practice can accept any responsibility for any loss either direct or consequential arising from information provided by this Code of Practice. The reader is advised to satisfy him or her self as to the accuracy of any advice given by researching the referenced standards, glossary and bibliography.

CONTENTS

1 Scope & introduction

1.1 The SmartHouse and its components

The SmartHouse consists of a large and wide ranging set of many Services, Applications, Equipment, Networks and Systems that act together in delivering the “intelligent” or “connected” home in order to address security and control, communications, leisure and comfort, environmental integration and accessibility. These components are represented by many actors that interact and work together to provide interoperable systems that benefit the home based user in the SmartHouse. Because of this wide ranging variability of the entities in the SmartHouse, there is a very high level of potential complexity in finding the optimal solution for any particular SmartHouse.

The main actors that influence the SmartHouse are the consumers (customers, subscribers, individuals) that live in and utilise the Services, Applications and Products that are designed for the SmartHouse. It is therefore appropriate that the other main set of actors are the service and application providers that deliver the services that the consumers need and require, including those responsible for installing systems in the SmartHouse and for maintaining them.

These consumers have needs and requirements in many areas and these are described in the Section on Consumers. Likewise the aims and objectives of the Service Providers in fulfilling consumer needs are described in the section on Service Providers. The installer also has to fulfil consumer needs and the Installation Process is described in the section on Installation.

1.1.1 Scope of the SmartHouse Code of Practice

The SmartHouse Code of Practice is a document that provides a “system designer” working to implement a SmartHouse (to be used as dwelling and as a home office) with a source of information on sensible and pragmatic guidelines for the design, installation and maintenance of SmartHouse systems and the services and applications provided.

It is recognised also that providers and installers must work within diverse regulatory environments and must be free to make choices appropriate to their business objectives (which in relation to this document focus on meeting the needs of domestic and small-office users, not large-scale commercial premises). Therefore, we consider standards as enablers and leave prescriptive aspects to local regulation.

SmartHouse includes the digital home, intelligent home, connected home, networked home. SmartHouse includes any “smart” activity, service or application in the SmartHouse including any form of “office” or working environment in the SmartHouse (but the smart office in commercial premises is excluded). SmartHouse covers any residential premises where people live (e.g. house or apartment) but excludes commercial and institutional premises (such as hotels or prisons and other commercial dwellings where the day to day management of the accommodation is not controlled by the resident.). SmartHouse includes consideration of the interface with the consumer (customer, subscriber, end user) and the consumer’s needs.

The aim is to provide a useful reference document to ensure that the user may exploit the benefits of a consistent system architecture by utilising European and International Standards and other generally accepted specifications in the design of the Smart House system. This document delivers a route to investment synergies, flexibility of services and useful and usable applications that satisfy the individual consumer’s needs and requirements.

There are many stakeholders in the SmartHouse, each with their own viewpoint and interests. Rather than try to provide a document that covers all the viewpoints, it was decided to write this Code of Practice as a guide for the System Designer of systems, applications and services in and into the SmartHouse. The interests of all the stakeholders overlap in the System Design of the SmartHouse.

The design and implementation of systems, services, applications and products requires detailed information about:

- consumer needs and expectations;
- user interfaces;
- security;
- the performance of both the wide area and local networks;
- the kinds of applications and services to be used;
- the equipment using it
- the principles of systems architecture
- and how the system and its components are installed, operated, maintained and used.

This Code of Practice provides a resource for the practitioner of the SmartHouse and covers information and issues that surround the choices to be made as well as providing a route map for the designer of systems in the SmartHouse. In short, the consumer must want or need the service or application, must be able to use it and have it delivered within a SmartHouse system that is installed so that it works effectively and seamlessly with the other systems and components in the SmartHouse. Any service, application or device in the SmartHouse should also be simple to use, easy and intuitive to operate and allow additional applications and services to be added retrospectively. This Code of Practice is therefore subdivided into sections addressing the environment in which the system designer is working and the requirements of the actors in that environment in order to place into context the decisions and constraints the System Designer must make.

The CENELEC SmartHouse Code of Practice covers the full range of stakeholders involved in the SmartHouse. Thus as Figure 1.1 below shows, the CoP ranges from the Service provider to the Consumer and takes in all the activities in between that allow services and applications to be delivered to end users including the installation, maintenance and management of the SmartHouse. Although the sections and stakeholders in the SmartHouse are shown as separate entities, thes are not mutually exclusive and any organisation properly qualified may undertake multiple roles in The SmartHouse.

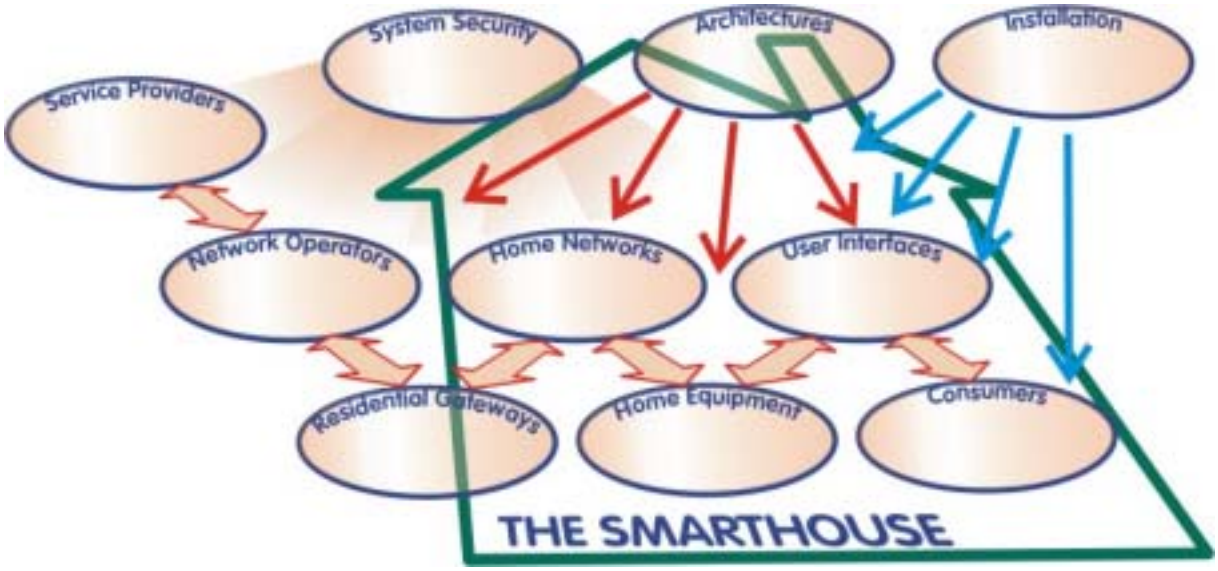

Figure 1.1. – The Sections of the SmartHouse

1.1.2 Parts of the Code of Practice

This Code of Practice is presented in four main Parts.

Part 1 - This Introduction

Part 2 - The environment of the SmartHouse

This section concerns market sectors where the SmartHouse is situated and provides the reason for any activity in the SmartHouse. It is important to understand that without consumers and the activity of service providers, manufacturers and system designers in meeting the needs of consumers, a SmartHouse is unnecessary. This section provides an understanding the SmartHouse environment, of the needs of the individual Consumer or owner of the system and the demands of Service Providers in providing the Consumer with appropriate applications and services and with optimal user interfaces.

We are all consumers and our needs influence the services that are developed for us to use. The provision of services to us as consumers creates a set of requirements on what is provided in the SmartHouse as systems, networks, equipment and user interfaces. It also creates a demand for the provision of communication networks from the service provider to the SmartHouse. Therefore the perspective of the Consumer and how the service provider needs to fulfil consumer expectations is an esential part of this Code of Practice. This Part consists of subsections that illustrate:

- The reason for a SmartHouse and why its value is more than the sum of its parts;
- the Consumer's needs and requirements; and
- the Service Provider's aims and objectives in meeting the consumer's needs

Part 3 - The SmartHouse system, product development and use

This part is divided into sections each describing the process for different aspects of the system in order to deliver the optimal System Design to fulfil the consumers requirements.

It is essential that the Components (products, services and applications) that are used in the SmartHouse are effective and easy to use and fulfil the consumer's needs. One consideration of this part is to understand how the overall architecture of service supply to the end user can be defined. There are many entities in the Service Service Chain each of which must satisfy the requirements of the service as provided to the consumer and must satisfy that each entity's business case. The sections of Part 3 are divided into Systems (what is needed to supply systems and applications) and Components the devices that the consumer interfaces with. They are as follows:

Part 3a - Systems

- Architectures
- The Wide Area and its Network Operators and delivery media
- The Home Networks and their Media
- Residential Gateways; and
- Security

Part 3b – Components

- Service and Application development
- Home Equipment
- User Interfaces

Part 4 - Installation

This part describes the processes that the Installer, Maintainer and Manager of the SmartHouse system should consider. It is placed last because the installer may need to understand and reference information from the preceeding sections and partly becase the installer may well be the system designer of a SmartHouse as well as managing the Installation Process. This part has one section.

- The Installation Process

1.1.2.1 Sections of the Code of Practice

The Introduction and each following section deliver material that provides:

- At the highest level, anyone with some knowledge of what may be possible
- At the next level, any practitioner of the SmartHouse with details of best practice
- At the lowest level, the system designer overall and experts in the specific area of the section, recommendations for implementing the SmartHouse

The four parts focus on the process of selecting from a wide range of possible options, what standards and practices to use and how to use them in configuring and installing systems for the SmartHouse. Because there are many ways in which this may be achieved, each subsection has a number of levels of description.

- The first level is an introduction that outlines the major issues of the subsection
- The second level describes the issues in greater detail and provides a decision process that assists the system designer in reaching appropriate design choices in the form of recommendations. Where decisions need to be made, then there are short descriptions of the issues.
- The third level is to guide the user where decisions have to be made. Here there are references to appropriate standards, specifications and ongoing standards and research work. Since there are many interactions and dependencies with other sections, these too are referenced.

1.1.3 Issues

Each of the sections below describe the issues as they relate mainly to the system designer of the SmartHouse. However each section will include specific issues that are relevant to the section and what any stakeholder will need to consider when designing, installing, managing and operating the systems and services of the SmartHouse

1.1.4 Recommendations

Each section provides a set of recommended methods of working, standards that should be used and will have a form of decision tree that will assist the user.

NOTE 1 The presentation of each section covers its specific area in the most appropriate way and this results in some sections being more descriptive than others. For instance in an area where there is a good set of definitive standards, the text is compact and the recommendations definitive but where the area is more subjective the text contains significant discussion.

NOTE 2 Because of the range of Services, Applications, Networks and Equipment in the SmartHouse, some sections have used the concept of grouping these services, applications, networks and equipment into clusters of similar Services, Networks or equipment. A cluster in one section does not imply a similar cluster in another one although in general clusters do relate to service, network or equipment requirements and these may overlap.

1.1.5 Annexes

As referenced in each section, European and International Standards as well as other specifications that are relevant can be found in a separate annex. Each annex has a general part and a part that is specific to each section. The annexes reference:

Annex A Abbreviations, Acronyms and Terms

Annex B Referenced Standards

- Standards
- National Standards
- Specifications and proprietary specifications
- and Standards and specifications in progress that are relevant to the issues and recommendations.

Annex C Additional Material (addenda and additional supporting material from sections)

Annex D Bibliography

Annex E Approving Experts and Experts involved in the Work

2 The Environment of the SmartHouse

Figure 2.1 – Environment of the SmartHouse

2.1 The reason for a SmartHouse and why its value is more than the sum of its parts

2.1.1 Introduction

The term SmartHouse is a convenient term for the convergence of intelligent devices and entertainment systems in the home. Devices that contain processors or are computers (pervasive computing) that can communicate with other systems are increasingly populating the home. Some of these are remote from the house and some can receive an ever increasing wealth of information and entertainment content from external and internal sources into or within the home.