GUIDELINE: USING SEGMENTATION TO BETTER TARGET USER GROUPS

Abstract

Segmentation aims to better understand customer diversity by dividing a diverse consumer group into a number subsets of users with common lifestyles, preferences or needs. This guideline provides an overview of the what, why, and how of segmentation and can be used as a starting point for better targeting different user groups. It sketches an overview of the different application areas of segmentation, including recruitment, communication, tailoring products and services, and evaluation. Also, it provides a birds-eye view of the steps taken in a segmentation exercise.

What is it?

Segmentation is a method that allows to understand the diversity within a target group. It is a starting point for better targeting different user groups, for example in recruitment, communication, the tailoring of products and services, and in the evaluation of project results.

Segmentation entails dividing a diverse target group of users into a limited number of (approx. 5-10) subsets ('segments') of users who have common lifestyles, preferences and/or needs. The approach was originally developed in marketing to understand which key categories customers fall into, and to estimate the size of those segments in the market. The current trend – driven amongst others by the advances in 'big data' technology – is to move towards using segmentation as a way to characterize individual households to enable more 'tailor made' customer interactions (SGCC, 2014a).

A key element is the segmentation model: the categories used to classify users. Traditionally, these models were often based on socio-economic and demographic variables, such as age, income, education level and household size. To be really useful, however, current segmentation models tend to take a broader scope of variables into account (see Sütterlin, 2011; Breukers and Mourik, 2013; McKinsey, 2013; SGCC, 2014a,b). Besides the socio-economic and demographic variables traditionally considered, these may include psychological and social factors (such as key motivations, lifestyles, attitudes, and beliefs), technical-situational factors (such as housing type and features of an households' electricity system), and energy use and other behavioural characteristics. This is referred to as 'integrated segmentation'

(McKinsey, 2013) or 'comprehensive segmentation' (Sütterlin, 2011; Breukers and Mourik, 2013).

Comprehensive segmentation of Swiss energy consumers (Sütterlin *et al.*, 2011)

The segmentation model developed by Sütterlin *et al.* (2011) aims at identifying the energy saving potential of target groups. The special feature of the model is its comprehensive character, including energy related beliefs and attitudes, and energy-related behavioural characteristics. The segmentation model is based on a survey among 1.292 Swiss respondents, including questions on socio-demographics, current energy-saving efforts, motivations underlying energy-saving behaviour, the acceptance of energy-related policy measure, and energy-related beliefs, attitudes and knowledge. Though a cluster analysis of the survey data, six consumer segments were be defined (percentages in brackets indicate the corresponding share in the Swiss population):

- **Idealistic energy savers** (16%): characterized by high energy saving efforts, idealism as a key driver, a willingness to make financial and other sacrifices, and support for policies that put a price on energy.
- **Selfless inconsequent energy savers** (26%): although clearly supporting energy saving, for example through high energy awareness and policy support, their actual energy saving behaviour is somewhat inconsistent.
- **Thrifty energy savers** (14%): adopt energy-saving behaviour and accept energy pricing policy as long as this does not bring them any negative financial consequences, with social pressure as an additional motivation.
- **Materialistic energy consumers** (25%): do little to save energy, but are open to energy efficiency measures for the house when it brings them financial gains.
- **Convenience-oriented indifferent energy consumers** (5%): the least likely to energy saving behaviour, with low energy awareness, a limited feeling of responsibility for energy issues, and primarily driven by personal comfort and convenience.
- **Problem-aware wellbeing-oriented energy consumers** (14%): although relatively energy aware, their actual energy saving actions remain limited, with a limited confidence in their ability to save energy, and a concern for loss of comfort and convenience.

When to use?

Segmentation is particularly helpful when the target group is diverse and 'one-size-fits-all' approaches are not likely to work. Segmentation can then be applied as a tool to better understand customer diversity as a basis for more effective end user engagement.

Segmentation, however, is not about delivering accurate predictions of user behaviour nor providing a definite answer on what are their specific preferences and needs. It should thus not be considered a replacement for more directs ways of user interaction (see also Breukers *et al*., 2014). Segmentation should thus rather be

applied as a part of an end-user oriented engagement strategy in combination with other interaction and dialogue tools, see the S3C guideline Learning about target groups.

We identify four key application areas for segmentation, which are further described below: recruitment, communication about new products and services ('messaging'), the tailoring of products and services, and for evaluation.

1. Recruitment

In a smart grid project, one may have different recruitment requirements in terms of the type of users they aim to engage. For example, one may strive for participant groups that are representative for a broader population, or (vice versa) aim to engage specific user types (say 'technological enthusiasts'). In both cases, segmentation can help to target those users that are needed in the project.

Using segmentation to monitor recruitment (Linear, Belgium)

Linear had the ambition of working in the field trials with a target group of households that would be representative of the overall Flemish population. To that end, a large-scale survey was conducted, involving a total of almost 2000 households, with about 500 people responding. A segmentation was then performed on the basis of people's attitudes towards smart appliances. The segmentation used the 'Technology Acceptance Model' developed by Davis (1989) and Davis *et al.* (1989), which probes into attitudes of potential customers to new technologies before these technologies enter the market. Attitudes are questioned on 4 dimensions: 'perceived ease of use', 'perceived usefulness', 'attitude towards using' and 'intention to use'. In addition, attitudes towards perceived safety, comfort, control, environmental friendliness, and costs of smart appliances were probed.

The following user types were distinguished (percentages in brackets indicate the corresponding share in the Flemish population):

- **Adherents** (35%):
  having a very positive attitude towards smart appliances (w.r.t. their perceived ease of use, impact on comfort, safety, possibilities to control appliances, etc.).
- **Proponents** (27%):
  also in general having a positive attitude towards smart appliances, but being a bit more sceptical w.r.t. safety and possibility to control smart appliances.
- **Doubters** (25%):
  have not yet formed a firm opinion on the use of smart appliances; their scores on perceived ease of use, impact on comfort, safety, possibilities to control appliances, etc. are mostly rather neutral.
- **Recusants** (12%):
  having negative attitudes towards smart appliances.

In the course of the recruitment phase, it became clear that the users willing to participate in the field trial were primarily made up of 'adherents' and 'proponents'. This meant that

extrapolation of the Linear results (e.g. in terms of flexibility provided) to the whole of Flanders needed to be done with carefully selected statistical techniques. Hence, segmentation in Linear was used to monitor the representativeness of the user population to improve the interpretation of project results.

2. Communication

Smart grid products and services may be appealing to potential users for very different reasons. For example, some users might be attracted by cost-reductions, while others are more interested in environmental benefits, the contribution to a stable energy supply, energy autonomy or any other benefit. Similarly, different customers might have different types of concerns, including privacy and security, loss of control over appliances, or general technological scepticism to name but a few. An understanding of the motivations and concerns behind segmented groups then offers a basis for user oriented messaging around new smart grid products and services that resonates with different user types (McKinsey, 2013).

Segmentation can also be useful to assess which communication channels (email, website, social media, phone, face to face) are most appropriate for reaching out to the different segmented groups.

3. Tailoring products and services

One may use segmentation as a starting point to tailor smart grid products and services to better match different user needs. For example, smart grid offerings may be adapted to the different customer segments, in terms of pricing schemes, technologies and energy consumption feedback offered. An important note, however, is that segmentation is not expected to deliver a blue print for an 'ideal' product. It is rather considered a starting point for a dialogue with users to assess which offering is best fitted to their needs and specific situations.

A starting point for tailored dynamic pricing schemes

Breukers and Mourik (2013) implemented the segmentation model of Sütterlin (2011) to develop tailored dynamic pricing intervention schemes ('Products and Services'). A 'toolbox' was developed consisting of a combination of 'tools', being pricing mechanism, technologies and feedback characteristics. Depending on the specific segment at hand, different combinations of tools are chosen to create a basic design for a tailored dynamic pricing intervention. The example below shows tools (blue blocks) to be chosen for the segment of 'idealistic savers'.

Note that these basis designs are not considered blueprints for all users within the corresponding segments. Rather, they are considered as starting points for a tailored approach considering factors such as house characteristics, appliances, presence patterns and household dynamics.

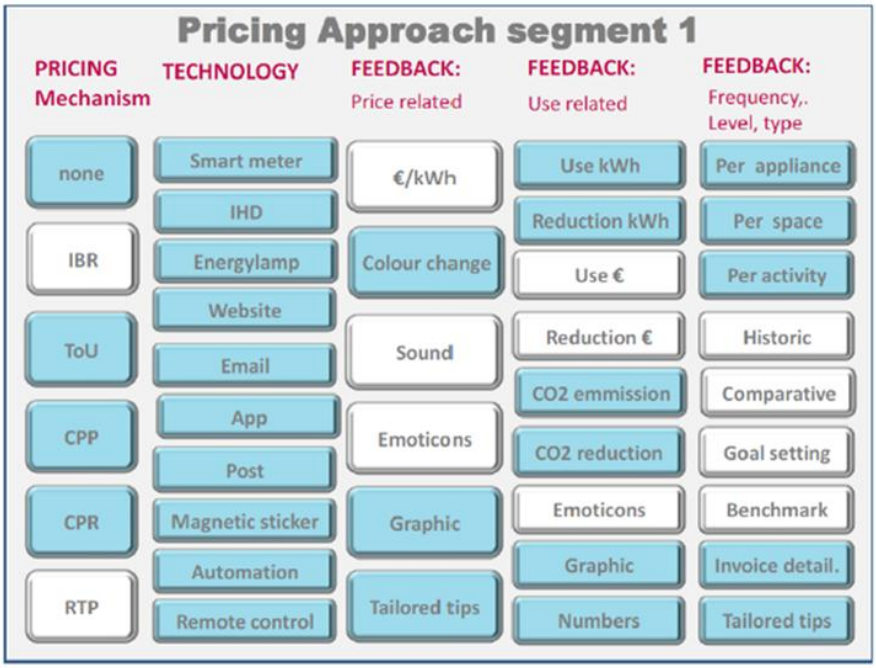

Figure 1: Suggested dynamic pricing scheme (blue blocks) for the segment 'Idealistic energy savers' (Breukers and Mourik, 2013)

1. Evaluation

Finally, segmentation can be used as part of a user focussed evaluation of smart grid project results. For example, one may want to better understand the different motivations and concerns of the users in the project and / or reflect on the actual adoption level of smart energy behaviour (like energy savings or flexibility provided) for different segmented groups. See also our guideline User-centred KPIs for the evaluation of smart grids and the tool Collection of survey questions for smart grid evaluation.

Using segmentation to uncover user motivations (eFlex, Denmark)

The E-Flex project aimed to further the understanding of the dynamics of customers flexibility for realising future smart energy systems. In this context, a study of user behaviour was carried out to better understand the variety of motives underlying more flexible energy consumption behaviour. Using segmentation, five different user profiles were found:

- The **Technician**: usually a technological 'front runner' with a willingness and interest to test new technologies and ideas.
- The **Economist**: motivated by optimising and saving energy, money and time.
- The **Curious**: motivated by learning new things about energy savings and flexible energy use.
- The **Sympathetic**: with the time and motivation to do something good for others and for the environment.

- The **Comfortable**: focussing on comfort and convenience in everyday life.

These profiles thus highlight the different motives for customers to participate in the project. They show that "customers can not just be seen as homo economicus, i.e. narrowly self-interested, rationally economic behaving individuals". These insights provide a basis to develop further incentives to encourage flexibility, beyond and complementary to the monetary ones.

Do's and don'ts

- **Define clearly for which purpose segmentation is applied.** Segmentation can enrich your products and services and strengthen user engagement, but don't expect it to deliver accurate predictions of user behaviour nor definite answers about their specific preferences and needs.
- **Apply comprehensive segmentation based on multiple variables.** Studies have shown that take into account a broader scope of variables than only socio-economics and demographics, delivers more powerful results. This implies that psychological-social factors, technical-situational factors, and behavioural characteristics should be included.
- **If you choose to apply segmentation, take it seriously.** It is highly recommended to refer to a specialized agency for advanced segmentation applications.
- **Integrate segmentation in your end user oriented engagement strategy.** Segmentation does replace directs ways of interaction and dialogue with users. It is essential to stay in touch with your customer base through other forms of interaction and dialogue tools – see the S3C guideline Learning about target groups".
- **Experiment with the S3C tool User group segmentation (light).** The segmentation light-tool is designed to obtain a quick scan of the characteristics of a user population in a smart grid project. It offers the opportunity to gain hands-on experience with segmentation as a way to get acquainted with the approach.

What do you need to do?

This guideline provides basic step-by-step information on how to implement segmentation in smart grid projects based on an existing segmentation model. For developing a new segmentation model, the reader is referred to the further reading or a specialized agency. Applying segmentation then involves the following steps:

1. Choose a suitable segmentation model
2. Find out whether it is feasible to obtain the necessary data (from and/or about your customers)
3. Process the data in order to attribute each customer to one of the segments
4. Implement the segments in your project.

Step 1: Choose a suitable segmentation model

'Comprehensive segmentation models' can roughly be divided into two types:

a. *Generic segmentation models:* generic models based on general characteristics, that can be applied to various topics. These models tend to be generic across countries and cultures. Examples:
   - SINUS Milieus (Germany)
   - Mentality (The Netherlands)
   - Values Modes (United Kingdom).

b. *Designated segmentation models:* models specifically tailored to (smart grid) products and programs and/or regions. Examples:
   - Accenture energy consumer segmentation (world-wide)
   - SGCC segmentation framework (USA)
   - Sütterlin's comprehensive segmentation of Swiss energy consumers (Switzerland)
   - eFlex project (Denmark).

To optimize end user engagement in smart energy projects, a designated segmentation approach seems more suitable than a generic segmentation model that requires further specification and or translation to the world of smart grids. However, as designated segmentation models were originally developed for specific (smart grid) products and programs and/or regions, they may not always be suitable for the specific context at hand. In all cases, caution is required when adapting and implementing a segmentation approach. Support from a specialized consultant or agency would be recommended, since many commonly used segmentation models (including the examples mentioned above) are not available 'open source'.

In general, criteria for choosing a segmentation model are (see also Vasseur, 2015):

- Data availability: Do I have access to data that is necessary to attribute my customer base to specific segments?
- Model availability: Do I have access to the segmentation methodology that is used to attribute my customer base to specific segments ('open-source')?
- Simplicity: Can I implement the segments in practice (e.g. tailor communication outreach, develop specific services, etc)?
- Relevance for smart energy projects: Does the segmentation approach incorporate drivers, barriers & engagement principles suitable for smart energy projects?
- Suitability for my target group: In order to have added value, it is recommended that each segment is significantly populated (all segments matter), that end-users falling within segments are sufficiently similar

(homogeneous among segments) and that end-users falling in different segments have markedly different profiles (heterogeneous across segments).

Step 2: Obtaining the data

Two approaches can be envisioned, possibly adopted in complementary fashion:

- *Databases*: Possibly, an existing database on the customer base is available, for example from previous customer research or from specialized data analytic agencies. In that case, a first step is to assess to what extent it incorporates relevant data to attribute the customer base to specific segments.
- *Surveys*: Additional information can be obtained through surveys. This involves approaching a statistically significant set of (potential) customers with a survey. The survey typically contains a set of closed questions, allowing for statistical analysis of the results.

Step 3: Processing the data

Data processing methodology depends on the chosen segmentation model. When implementing an existing (commercially developed) model, in most cases, data processing should be done by a specialized consultant or agency.

Step 4: Implementation

Decide how the segmentation approach will be practically applied in the development or implementation of your project. As described in the section 'When to use?', segmentation can typically be applied for:

- Recruitment
- Communication
- Tailoring of Products and Services
- Evaluation.

Get started!

To gain hands-on experience with segmentation, please take a look at the simple and highly accessible S3C User group segmentation (light) tool. This tool adopts the segmentation model of Sütterlin (2011) (step 1), uses a short survey to collect data (step 2), with data processing (step 3) incorporated in the spreadsheet-tool. Inspiration for implementation (step 4) regarding the tailoring of smart grid products and services can be drawn from Breukers and Mourik (2013).

Further reading

- Accenture (2011). *Revealing the Values of the New Energy Consumer.* Accenture end-consumer observatory on electricity management 2011. Available at: http://www.accenture.com/SiteCollectionDocuments/PDF/Resources/Accenture_Revealing_Values_New_Energy_Consumer.pdf
- Breukers, S. and Mourik, R. (2013). *The end-users as starting point for designing dynamic pricing approaches to change household energy consumption behaviours.* Report for Netbeheer Nederland, Projectgroep Smart Grids (Pg SG). Arnhem: March 2013.
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- McKinsey (2013). *Using a consumer-segmentation approach to make energy-efficiency gains in the residential market*. McKinsey & Company, Electric Power/Natural Gas.
- SGCC (2014a). *Segmentation Successes.* Presentation in the SGCC peer connect webinar series. Available at: http://smartgridcc.org/wp-content/uploads/2014/02/Segmentation-Successes-Web-v2.pdf
- SGCC (2014b). *2014 State of the Consumer Report. Smart Grid Consumer Collaborative (SGCC).* Available at: http://smartgridcc.org/wp-content/uploads/2014/01/2014-State-of-the-Consumer.pdf
- Sütterlin, B., Brunner, T., Siegrist, M. (2011). *Who puts the most energy into energy conservation? A segmentation of energy consumers based on energy-related behavioural characteristics.* Energy Policy 39: 8137–8152.
- Vasseur, V. and Kemp, R. (2015). *A segmentation analysis: the case of photovoltaic in the Netherlands.* Energy Efficiency. DOI 10.1007/s12053-015-9340-8.

This guideline was developed in the S3C project, and is freely available from www.smartgrid-engagement-toolkit.eu.

S3C paves the way for successful long-term end user engagement, by acknowledging that the "one" smart consumer does not exist and uniform solutions are not applicable when human nature is involved. Beyond acting as a passive consumer of energy, end users can take on different positions with respective responsibilities and opportunities. In order to promote cooperation between end users and the energy utility of the future, S3C addresses the end user on three roles. The *smart consumer* is mostly interested in lowering his/her energy bill, having stable or predictable energy bills over time and keeping comfort levels of energy services on an equal level. The *smart customer* takes up a more active role in future smart grid functioning, e.g. by becoming a producer of energy or a provider of energy services. The *smart citizen* values the development of smart grids as an opportunity to realise "we-centred" needs or motivations, e.g. affiliation, self-acceptance or community.

S3C performed an extensive literature review and in-depth case study research in Smart Grid trials, resulting in the identification of best practices, success factors and pitfalls for end user engagement in smart energy ventures. The analysis of collected data and experiences led to the development of a new, optimised set of tools and guidelines to be used for the successful engagement of either Smart Consumers, Smart Customers or Smart Citizens. The S3C guidelines and tools aim to provide support to utilities in the design of an engagement strategy for both household consumers and SMEs. The collection of guidelines and tools describe the various aspects that should be taken into account when engaging with consumers, customers and citizens. More information about S3C, as well as all project deliverables, can be found at www.s3c-project.eu.