

Customer Satisfaction

Monday mornings have often been tough for Henri. This time he decides already on Sunday evening that he will start the week with physical exercise. It takes some time for him to find the right rhythm but then jogging becomes an automatic process leaving room for free-flowing experience. Afterwards he makes some simple yoga exercises Irene had thought him, including deep breathing, relaxation, and as silent a state of mind as he can reach.

What is the topic for today? Marketing, Henri remembers and tries to recall something useful from the lectures about marketing. From the viewpoint of a small company with limited resources and expertise, marketing shall be somehow ingenious. Traditional media, like TV ads: hopeless. Own web page is a must, but it does not solve completely the marketing dilemma before people become aware of the product. Viral marketing is a concept that fascinates Henri. The first part of the marketing campaign shall concentrate on a sector that could be called the innovators, persons who are keen to test whatsoever product if it provides significant novelty. That phase might even be considered a part of product development.

The most critical phase in marketing takes place when the positive message about the product starts to spread. Henri is not sure whether it would be reasonable to seek publicity for Flourishator on discussion forums, social media sites, or blogs. Rather he assumes that an optimal solution would be to rely on the networks of personal contacts. The product itself must support an easy way to recommend it to friends through various channels: e-mail, Facebook, or even text message.

The best advice would be advice that includes contacting some friends in a beneficial manner. An innocuous footnote tells that the contact was made partly because of the advice given by an application called Flourishator. He sketches quickly a logo



Advised by
Flourishator

but was sure that Irene would be more than happy to design something more alluring. That might be, Henri believes, one of the most critical elements of the

application. The sign must be visible enough to attract new users, but at the same time, it must not diminish the emotional value of the personal contact made by a friend. The application has to preserve the positive emotional effect through the dissemination process. Henri is not sure whether that would ever succeed, but he is convinced that the marketing plan will now be detailed enough for the assignment. He decides to send the logo to Irene.

On Monday evening, Henri goes to movies with two friends. In the brief bus trip to downtown, they discuss about the annoyance of advertisements before movies. Isn't it strange that they need to watch ads in addition to the price they pay? One of Henri's friends suggests that the movie business should be based purely on ads in a similar manner as the advertisement-based TV channels. How long would you be willing to watch commercials before a movie? Henri asks. Maybe half an hour, the friend replies, if the ads were somehow entertaining or perhaps useful in some sense. Still, they ponder, "Would the actual movie experience be the same after watching all the ads?" Ten brief videos about masculine cars, fancy mobile devices, holiday trips to exotic places, healthy diets, and so on. What a mental cost and waste of time. Henri thinks that twenty minutes could be somehow acceptable but definitely not more than thirty minutes.

Now the friend who has studied economics makes a quick calculation: if 25 minutes of watching ads is the same for a person as a ticket price of 10 Euros, it means that the person would be willing to watch ads with a net wage of 24 Euros per hour. If tax rate were 30 percent, that would mean a gross wage of about 34 Euros per hour. The other friend, who has some experience with psychological experiments, ponders whether he would rather sit an hour in an empty room without any stimulus than watch an hour of ads. Maybe after a period in an empty room, ads would be appreciated. Conversely, after a period of watching ads, an empty room would be appreciated. They continue their discussion without a clear conclusion until the trailers of forthcoming movies start to fill their mind.

A perspective on customer behavior

What should a communications ecosystem expert know about customer satisfaction, marketing, and our deep longing for all kinds of new devices? I would claim, quite a lot, because as the first rule presented in the Introduction chapter says, the driving force for communications ecosystem is human benefit. Without the ceaseless demand for new products and services, the ecosystem would become much weaker, if not die.

Steve Talbott (2004, p. 19-23) summarizes the story written by Wade Davis (1996) about a young Waorani hunter in the deep forest of the Amazon. The Waorani was one of the last tribes to be contacted by western culture. The Waorani hunter was extremely skilled with a

blowgun. He could hit a hummingbird out of the air or a monkey from a distance of 30 meters. The use of the blowgun was an art with adept use of razor-sharp teeth of a piranha jaw and toxins extracted from plants. Still, the hunter preferred shotguns although the available guns were poor, unreliable, and unsuitable for hunting small animals like birds or squirrels. From a rational viewpoint, the acquisition and use of the shotgun did not make much sense. It seems that the character of the object itself was the main reason for the attractiveness of guns, not the usefulness of the guns. Perhaps the feeling of power and excitement when the gun was fired was irresistible.

It is easy to suppose that the behavior of the Waorani hunters was just due to the contamination effect of western culture. Were the gun sellers so competent and cunning that they were able to manipulate the authentic hunters? In the light of the story, it seems that the hunters had an innate mental process that created an inclination towards fascinating devices. This process has likely provided some evolutionary advantage even though the consequences sometimes appear to be unfortunate or disastrous. The almost universal attractiveness of western culture based on ever-increasing consumption is a sign of this process in the mind. As far as I can assess, this tendency is rather independent of the cultural background. Rather, strong culture and efficient education are needed to avoid the negative effects of this inborn tendency.

We may also ask: has evolution in this case gone right or wrong? From a pure evolution perspective, right means something that will persist through many generations (due to natural selection) while wrong means something that will not persist (see also Figure S.3). In this respect, evolution obviously has been right; you only need to go any to shopping center to find proof.

However, another matter is whether the result of this tendency is beneficial for us as human beings in the long term in an environment that incessantly provides an excessive amount of attractions. Does this irresistible temptation to obtain new products serve our life in general? According to happiness studies the answer seems to be no. Most of the devices are unable to generate any permanent happiness or satisfaction after the short burst of joy when the device is acquired.

Why on earth, then, do we tend to behave in this curious manner when we come across novel products, devices, and items? Note that the selected criterion for assessing the reasonability is happiness, which is an appropriate but not an evident choice. A person may pursue something other than happiness, and often does as discussed in Chapter H. Therefore, we have to resist our temptation to judge even extreme consumption as inconsistent, irrational, or erroneous (from the perspective of an individual), even when the devices cannot provide any permanent happiness. Evolution just tells us—through the emotions associated with an item—that the item might be worth acquiring. Nevertheless, the emotions do not guarantee that the item will be beneficial for us in the long run.

But what does beneficial mean? Many products we have collected have become so integral to our lives that we would suffer if we had to give up them, although sometimes it is a pure pleasure to get rid of something. In general, those products do not make us permanently happy, because there is no need to pay any more attention to the products when we already possess them. There are even more products and items that we have forgotten and, thus, are

irrelevant for us. Maybe most of us would do better if we were able to better control our buying behavior. However, it is not the primary topic of this chapter to teach how to become a reasonable consumer, but rather to understand how most of us behave when purchasing and consuming products and services.

Because a great majority of our everyday decisions are based on intuition instead of reasoning (see discussion in Chapter H and particularly Figure H.1), we should not assume that the results of our decisions are consistent if we analyze them only by means of formal reasoning and if we limit the analysis to the context of current time and society.

It is also useful to make a clear distinction between the customer role and the user role. A customer model shall be internally consistent, and similarly any user model shall be internally consistent. These consistencies do not mean that what a person seems to optimize when acting in the customer role is the same as what the same person seems to optimize when acting in the user role. A customer may buy a certain mobile phone because of its attractive appearance, but still use it mainly for maintaining her social relationships without paying any attention to the appearance of the phone. Thus, user and customer roles shall be modeled and evaluated separately, but keeping in mind that the roles and models have strong mutual interrelations. Thus, we may utilize the framework presented in Figure H.3 with two key concepts: sense of coping and sense of significance. In the customer role we are usually directed towards sense of coping, whereas the user behavior leans more towards sense of significance, although the decisions are not necessarily based on any conscious deliberation (as the popularity of voice and text message services demonstrates).

Terms

As illustrated in Figure I.1, this chapter discusses a part of communications ecosystem consisting of commercial products, customers and their satisfaction (or dissatisfaction). Thus, this chapter provides a link between general human undertakings and economics activities. The viewpoint is that of a customer, instead of, for instance, a business actor or a member of a community. In addition to individual customers, we consider the general activities of larger groups or even the society as a whole. We aim at constructing a sensible connection between the emotions of individuals and the behavior of large group of people. Because of that objective the most important phenomena to be addressed is how (typically technical) innovations are adopted by a group of people.

The key terms used in this chapter are:

acceptance: a mental attitude that something is believable and should be accepted as true or beneficial,

adoption: a process of accepting with approval,

attention: the cognitive process of selectively concentrating on one aspect of the environment while ignoring other things,

attitude: a feeling, emotion, or mental position with regard to a fact or state,

consumer: a person who buys and uses commercial goods or services,

customer: a person or organization who pays for goods or services,

diffusion: the spread of an idea, product or process beyond first use,

innovation: an idea, practice, or object that is perceived as new by an individual or other unit of adoption,

loyalty: an attitude of being faithful to somebody or something,

marketing: the business activity of presenting products or services in such a way as to make them desirable,

product: any good or service that is a result of a process and that is intended for delivery to a customer or a user,

satisfaction: a condition of peacefulness and tranquility of mind resulting from compliance with its desires or needs,

service: an event in which an entity takes the responsibility that something desirable happens on the behalf of another entity, and

trust: confidence in and reliance on good qualities, especially fairness, truth, honor, or ability.

In addition, the following terms related to the customer role are defined in Glossary of this book:

advertising	early adopter	judgment	priming
awareness	early majority	laggard	rationalization
boredom	esteem	late majority	reputation
confirmation	excitement	long tail	salesman
connector	fairness	maven	segment
customer experience	feature	oxymoron	subscriber
customer satisfaction	flat rate	persuasion	substitution
delight	frustration	pleasure	want
desire	good	popularity	wealth
discomfort	innovator	preference	word of mouth

Note that *innovation* is often used to describe a more limited process in which *inventions* are translated into commercial goods or services. Here I follow the interpretation of Everett Rogers (2003) and define innovation as a novel object, not as a process of commercialization of an invention. In the context of communications ecosystem, innovation is often but not always technical. A novel way of using an existing application is an innovation even when the technology remains unchanged.

Product is a superordinate term that embraces both tangible *goods* and *services*. The aim of both goods and services is to fulfill some human need but in different ways: a good requires activity by the user while in the case of a service someone else is responsible for the fulfillment of a need. In the case of communications, products usually include both goods and services.

Note also that the above definition of service means that *self-service* belongs to the extensive collection of marketing jargon, or it might even be considered

oxymoron: a figure of speech in which apparently contradictory terms appear in conjunction.

Be careful with marketing jargon in general, because the main reason for using it usually is to blur reality. For instance, the use of self-service indicates that a service is intentionally deteriorated in order to improve the business of the service provider.

Marketing

This brief account of issues related to marketing is primarily based on three books: *The next evolution of marketing, connect with your customers by marketing with meaning* by Bob Gilbreath (2010), *Satisfied customers tell three friends, angry customers Tell 3,000* by Pete Blackshaw (2008), and *The satisfied customer, winners and losers in the battle for buyer preference* by Claes Fornell (2007). These authors are also shown in Figure A.13 where they form a distinct group at the left side of the map of communications ecosystem authors.

I would recommend reading these or some other marketing books, even though you may initially have a negative attitude towards marketing in general. Surely, our life is full of advertising that is distracting and useless, and sometimes even harmful. It is somehow illuminating that marketing specialists need to justify their work both for general audience and for themselves. For instance, Pete Blackshaw (2008, p. 96) presents the brand-association map made by the consultation company Nielsen for the term *advertising*. The innermost circle includes two adjectives: false and misleading. No wonder that advertising business is as emotionally demanding as discussed by Gilbreath (2011) in the Epilogue of his book titled “Adding meaning to your life.”

Still marketing and advertising remain an integral part of market economics. Thus, it is important for a CEE to understand the fundamental nature of marketing particularly in the context of digital economy. Remember also that one of the greatest success stories of the last decade, Google, is based on a combination of technical performance, usability, and advertising. Bob Gilbreath even wants to classify Google as an advertising and marketing-focused company (2010, p. 271).

The additional value of this marketing discussion is not so much in any deep insight into the secrets of marketing but rather in the viewpoint of an outsider observer. Particularly, I will exploit three of the CEE rules presented in Introduction: Rule of human benefit, Rule of metrics, and Rule of all-inclusive evaluation.

Let us first consider a very tough issue: what is the effect of marketing on the well-being of society? You may think that this question is too hard or philosophical too to be seriously discussed, or maybe irrelevant from the perspective of an ecosystem expert. However, if you think about the underlying goal of regulation and laws, you likely end up with something like the well-being of society. The recent laws prohibiting smoking in restaurants and other public places are a typical example. Smoking is prohibited because it does harm also for people who

are not smoking. Other examples, closer to the realm of communications ecosystem, are the prohibition of email spam and restrictions to use phone calls and text messages for advertising purposes. It is possible that a CEE sometimes needs to evaluate or even give recommendations about the feasibility of regulation from the perspective of the total well-being of a society.

What could we say about the influence of marketing or advertising on the human well-being? Figure 9.1 in Gilbreath (2010) is illustrative. The essence of the figure consists of three concepts: *engagement*, *meaning*, and *marketing*. The words form a triangle in which arrows are directed from customer *engagement* to both *meaning* and *marketing*. The arrows are orthogonal. In Gilbreath's terminology, *meaning* describes the quality of people's life, whereas marketing refers to the profitability of business. Indeed, these two aims are often orthogonal, if not contradictory. It might be attractive to assume that in the long term they become somehow harmonized with each other. Maybe they will be, although it is hard to believe that every advertising or marketing campaign would be beneficial for the society in general. Thus, I am inclined to claim that the influence of marketing on human well-being depends on the specific characteristics of each marketing campaign.

What Gilbreath strongly advocates is a marketing approach that generates profits through improving people's life. This is a natural approach for anyone working in a business environment, and surely much better than ignoring people's life and well-being entirely. Still someone else, not working in marketing or other hard-core business may instead express essentially the same message the other way around: the objective of meaningful marketing is to improve people's life by using profitable business as an instrument.

Marketing in general might increase the total wealth of society by increasing the volume of economic activities. However, it is not at all obvious whether most marketing campaigns have any positive effects on sense of significance. Likely not. Fortunately, there are some admirable examples of companies that genuinely increase the sense of significance while doing profitable business (see as a great example the epilogue in Gilbreath 2010).

The dilemma between the business opportunity and the well-being of society might still be hard for an individual salesperson or advertiser to deal with. What shall he or she do if a competitor starts a marketing campaign that is economically successful but very questionable from a human perspective? Should the salesperson just imitate the competitor or present the competitor as the culprit for all undesirable consequences? I would rather recommend, also in the spirit of Gilbreath, to exploit the situation in a different way. If some of the consequences of the competitor's campaign are obviously harmful, that harm will eventually become known, even if the campaign is a short-term success. Thus, let the long-term reputation of the competitor suffer, and at the same time take care of your customers and society in an appropriate manner, even at the cost of short-term losses, if necessary. If the market sector does not enable a business strategy that also improves the well-being of people and society, change the sector in which you working.

What could we say more about the objectives of marketing by utilizing the framework of emotions presented in Chapter H? The emotions created by marketing can be grouped in to three sectors: E_1 includes emotions from competence to satisfaction, E_2 includes emotions from happiness to serenity and E_3 includes negative emotions as illustrated in Figure C.1. Note that happiness and satisfaction both belong to the sector E_1 and sector E_2 . Emotions in sector

E_1 are more likely to improve the sense of coping of the persons whereas emotions in sector E_2 are more likely to enhance the sense of significance. However, there is not necessarily any direct mapping between the sectors, on the one hand, and the SoS and SoC assessments, on the other hand, because people are free to define what SoS and SoC means for them.

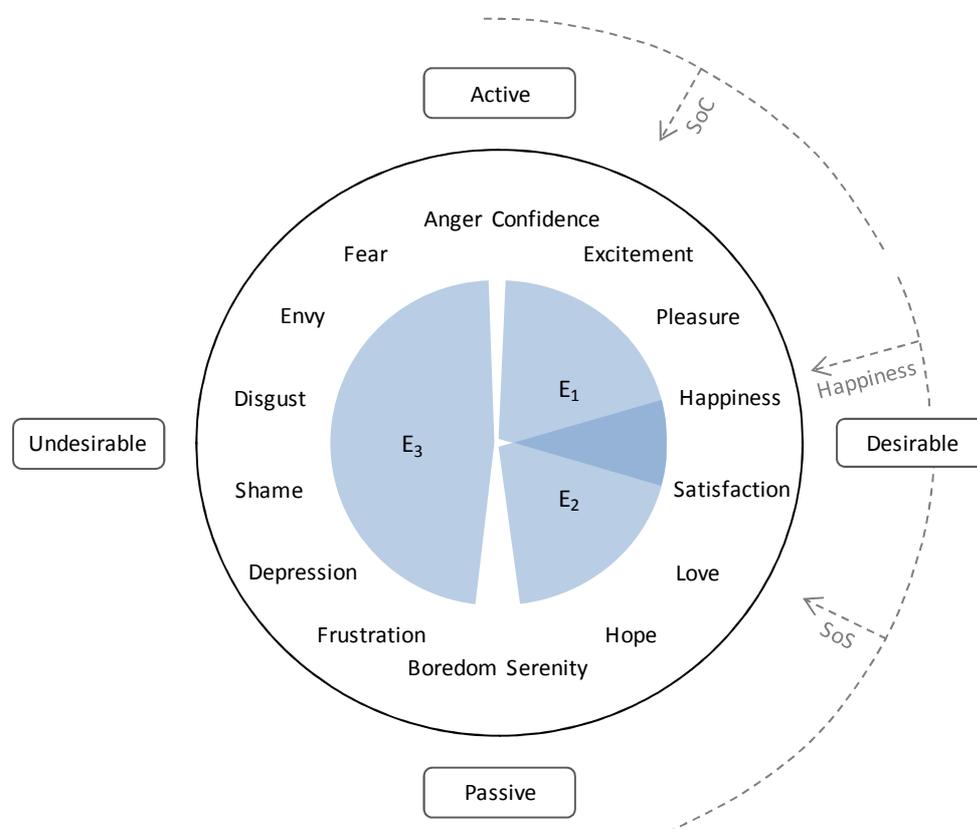


Figure C.1: Emotion sectors for assessing the effect of marketing on customer experience
SoC = sense of coping, SoS = sense of significance.

Why are pleasure, excitement and confidence excluded from emotion sector E_2 ? The answer is related to the rule of all-inclusive evaluation. Confidence, excitement, pleasure, and similar emotions can be considered more self-centered than satisfaction, love, hope, and serenity. Thus, even though the individual person might think that the “final” outcome of marketing was beneficial for himself, the outcome might be less beneficial (or even harmful) from the perspective of the society. This difference can also be reflected in the emotions that the outcome generates.

Let us consider a successful marketing campaign for a new car that leads to a purchase that is profitable for the car seller. Thus, the marketer has achieved his main objective. In addition, the new owner might feel excitement and competence, particularly when he com-

compares his new car with the older cars of his neighbors. The purchase hardly creates any deep hope, love, or serenity in any person involved. Furthermore, the individual purchase has many external unintended effects. If we consider the positive emotions of the purchaser and the marketer as positive signs, we must consider in similar manner any negative emotions of any other person as negative signs. Both the new owner and the marketer may ignore those other, negative emotions, or even feel more self-confidence because of them.

However, a CEE as an outsider observer must not ignore any observable, significant effect. The negative effects must be taken into consideration. As a straightforward method, one could weigh up the type and the strength of emotions the purchase gave rise to. The result is a set of values for E_1 , E_2 , and E_3 for the most relevant people. Note also that the scale for E_1 , E_2 , and E_3 should be linear in the same way as the eudemony scale to allow meaningful additions. A similar analysis shall be done for a number of similar events in order to grasp the overall picture. The number of events may be, for instance, the typical number of car purchases during a month in a community.

Finally, the individual values are added up:

$$E_k = \sum_{i,j} w_i E_{k,i,j}$$

where $E_{k,i,j}$ is the total volume of emotions in sector k induced by event j in individual i , and w_i is the weight for individual i . As tentative rules of thumb, I would make the following suggestions:

- For business analysis select $w_i w_i = 1$ for the purchaser of the product, whereas for other people the weight might be much smaller ($0 < w_i < 1$) because their effect on the business is smaller. Business will likely be successful if $E_1 > 5E_3$ whereas if $E_1 < 3E_3$ business success is doubtful in the long term. Here E_1 and E_3 mean the average emotions in sectors 1 and 3, respectively, experienced by the customer of each purchase event.
- For well-being analysis select $w_i w_i = 1$ for all people involved. The total well-being of the society will be surely improved if $E_2 > 5E_3$ whereas if $E_3 < E_2 < 3E_3$, the well-being of the society is endangered, and if $E_2 < E_3$, the outcome can be surely considered harmful for the society.

The factors 5 and 3 are based on the studies of positive psychology and on the customer satisfaction studies (see Fredrickson 2009 and Fornell 2007).

In principle, this kind of analysis is doable, but primarily it can be considered a mental framework. In any case, it is too simplistic to estimate only $E_{1,1,1}$, that is, the clearest positive effect of a particular event on the main person involved. A CEE must also consider other types of emotions ($k = 2$ or 3), other individuals ($i > 1$) and other similar events ($j > 1$) in order to get a proper view on the collective outcome.

Now an attentive reader may notice that there can be many other effects in addition to emotions. The new car may provide better performance and safety, and lower fuel consumption. In the end, even these consequences result in either improvements or deteriorations of the eudemony of individuals. Thus, (in principle) they can be included in the emotional analysis outlined above. Although a complete analysis would be too complex to be carried out, a rough judgment can be made. Does the improved performance of the car really improve the well-being of the society? Safety is apparently desirable, but how much does the improved perception of safety alter the driver behavior; maybe towards more risky behavior? Does lower gas consumption also increase the attractiveness of driving?

The last questions are related to systemic effects. There is no clear boundary between collective and systemic consequences. However, collective means primarily relatively straightforward and noticeable effects that concern both the primary person (e.g., the buyer of product) and other people directly involved in the event. In addition, collective analysis shall usually be made for several similar events. In many occasions, the effect of a certain type of event on other people is easier to analyze if it is assumed that many similar events happen at the same time. In any case, we can use our capability to assess the emotions created by all kinds of events—and we can make surveys to get reliable data for further analysis.

In contrast, an appropriate system analysis must take into account the adaptation process. Let us take an example. If the roads from a downtown to sub-urban areas of a city are improved in a way that the average speed is increased from 40 km per hour to 80 km per hour, what would be the consequences? Obviously, the average travelling time will be halved, and many drivers, therefore, would become happier. That would be the marketing message of some politicians, and many residents would take that for granted.

That change would happen during the first week or so. However, all kinds of adaptation processes may emerge later. One inevitable consequence is increased traffic and fuel consumption. Increased traffic would most likely consume some of the immediate timesavings because of higher traffic volumes during the busiest hours. The traffic jams in downtown would also be aggravated. Furthermore, shortened travelling time will affect the price of apartments: those sub-urban areas that are now reachable within 30 minutes from downtown instead of 50 minutes will become more expensive. That may result in a situation in which more people are willing to buy houses that are located further away from the downtown. Finally, as a result the average commuting time would return to the original level.

Consequently, the main long-term benefit is not any reduction in travelling time but somewhat more spacious apartments and a different type of living environment. On the cost side, we have to include the increased fuel consumption and a larger number of cars. That kind of development may increase the perceived sense of coping because of larger houses and more cars. It is, however, difficult to evaluate how this kind of change affects the overall sense of significance in the society as a whole. Everett Rogers (2003, p. 470) expresses this phenomenon as follows:

“The undesirable, indirect, and unanticipated consequences of an innovation usually go together, as do the desirable, direct, and anticipated consequences.”

Still, regardless of these concerns about the benefits of marketing and consumption, I recommend Bob Gilbreath's book about marketing with meaning. There are many appropriate examples of marketing campaigns that seem to be able to combine economic objectives and customer satisfaction. There are even some examples in which the campaign seems to increase also the total well-being of the society (see examples in chapter 5 in Gilbreath 2010).

We may also assess the effect of marketing methods by means of the value of time model. Figure C.2 provides an example based on studies with master-level students at Aalto University in 2010 and 2011. The average value of time for the students was 38 Euros per hour. On average, the students were willing to work in a hamburger bar for a wage of 12 Euros per hour (which was considerably higher than the real wage offered by Hamburger bars at that point of time). Still working without any compensation at all was clearly more preferable than spending time without the possibility of doing anything (zero-benefit level). The same method was also used to estimate the sacrifice of watching advertisements before movies. The result was that the gross benefit of watching advertisements was not much above zero-benefit level and much below the benefits of working in hamburger bar without salary.

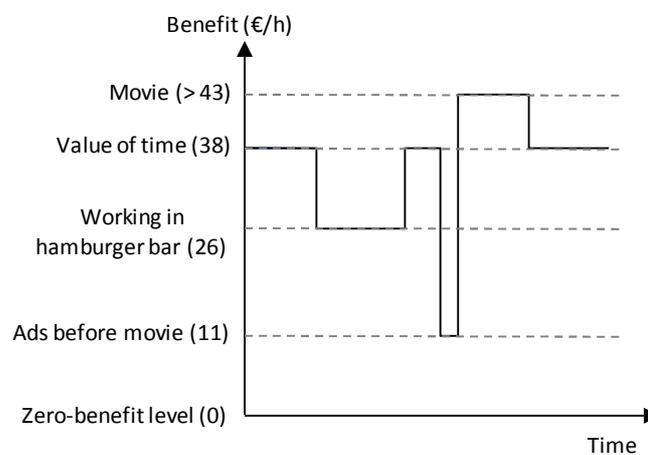


Figure C.2: Momentary benefit for a student during different activities: first working in a hamburger bar and then going to the movies in which ads are shown before the movie starts.

Personally, I agree with these results: sometimes the advertisements before movies are a major nuisance for me and even affect my willingness to go the movies. I strongly doubt whether the advertisements really are beneficial for the business of movie theaters. This inference is also supported by findings presented by Blackshaw (2008, p. 136): advertisements before movies have very low consumer acceptance.

However, there are still ways of advertising with even lower consumer acceptance: email spam and phone solicitation. If we assume that the acceptance scale in Blackshaw's (2008, p. 136) credibility quadrant is linear, then the gross benefit level of phone solicitation seems to be

negative (that is, below zero-benefit level). According to the same figure, the benefit level of TV ads is about the same level as working in a hamburger bar. Although these findings are based on limited studies and rough reasoning, the conclusions appear credible.

Bob Gilbreath (2010, p. 29) expresses it as follows:

“Interruptive advertising is increasingly viewed as yet another source of unwanted pollution. While [marketers] could once rely on a steady stream of sales with a continuous flow of ad dollars, advertising as it is practiced today is viewed as a noisy negative externality pushed onto people [marketers] are meant to serve.”

Thus in the case of marketing (and in any human activity) it is important that the activity serves both sense of coping and sense of significance. Without sense of coping, the result will be similar to the fate of entity of type 3 in Figure S.3; no individual can survive without the ability to cope with everyday challenges. Without sense of significance, the society as whole is likely to experience a similar fate. The standpoint of this book is that the sense of coping of a person is the best measure evolved throughout evolution to assess the person’s ability to cope with the challenges of reality. Similarly, the sense of significance is the best measure to assess the community’s ability to cope with the challenges of reality. An activity is worthy of doing if it has a positive effect both on the sense of coping and the sense of significance.

An outsider observer, like a CEE, has to estimate these effects not only from the perspective of the active individual(s) but also from the perspective of all people affected by the activity. If a person genuinely wants to develop her or his sense on significance, she or he shall exercise this kind of holistic assessment. Rogers (2003, p. 440) expresses this in the context of diffusion studies as follows:

“The goal of diffusion programs is to raise the level of Good in a system. “

The secret of successful marketing is that the marketing campaign is able to create both sense of coping and sense of significance, and finally high customer satisfaction. In Claes Fornell’s (2007, p. 96) words:

“... customer satisfaction is similar to finding a good dancing partner, and matching is the most critical element –not quality, not price.”

In the framework of this book matching is achieved when the marketing and the product creates both sense of coping and sense of significance. Sense of coping can be created by means of usefulness or momentary pleasure. An efficient way to combine these is to tell persuasive stories.

Modeling customer behavior

In the context of communications ecosystem, it seems that after the purchase of the first mobile phone, the main decision of a typical consumer concerns the required features of the next phone instead of purchasing an additional device. Some of those features, for instance,

high speed network access and GPS (Global Positioning System), make it possible for the user to benefit from new services or applications that earlier required a dedicated device.

It seems that “smart phone” is one of those rare product categories in addition to personal computers that attracts all kinds of functionalities. Tablets have the potential to become a similar product category, particularly when electronic newspapers, magazines and books replace conventional paper versions. Thus, the diffusion of features is a critical issue in the context of communications ecosystem (see, e.g., Kivi et al. 2012). This phenomenon also gives a justification for a general approach to consider the mobile communications business as the most important foundation for an extensive communications ecosystem. Remember also that the size of personal communications business has always been much larger than similar entertainment business (see Odlyzko 2001).

When modeling customer behavior, there are two main options. In the first option, we model the decision process as realistically as possible from the viewpoint of individual persons. What happens when a customer is selecting, say, a new mobile phone? What are the criteria the person is using when evaluating the pros and cons of the product, and when comparing it with other products? An ecosystem model needs then to include numerous models representing different customer segments in order to cover that behavior of the whole population. In the second option, the customer model does not describe realistically any individual person, but instead it models the overall behavior of a population as a whole.

The model adopted in this book is a combination of these two options. Most of the input parameters in the model describe the behavior of an individual person. Still the model itself primarily describes the overall behavior of a customer segment. As a mental model, you may think that part of the model describes the emotions, attitudes, and skills of an average customer belonging to a customer segment while another part of the model provides the conversion from the average satisfaction of customers to probabilistic distribution of buying behavior within the segment.

Figure C.3 illustrates some aspects that affect how customers select between different products. The complex selection process is divided into three phases. First, the customer makes a decision to consider the possibility to buy a new product like a mobile device. Secondly, the customer may have to decide the general product category: for instance, between ordinary mobile phones with basic functionality and smart phones with advanced features. Finally, the customer has to select a particular phone within the product category. At this stage of the process, the loyalty towards a brand may play a smaller or bigger role. In practice, the process might be even more convoluted.

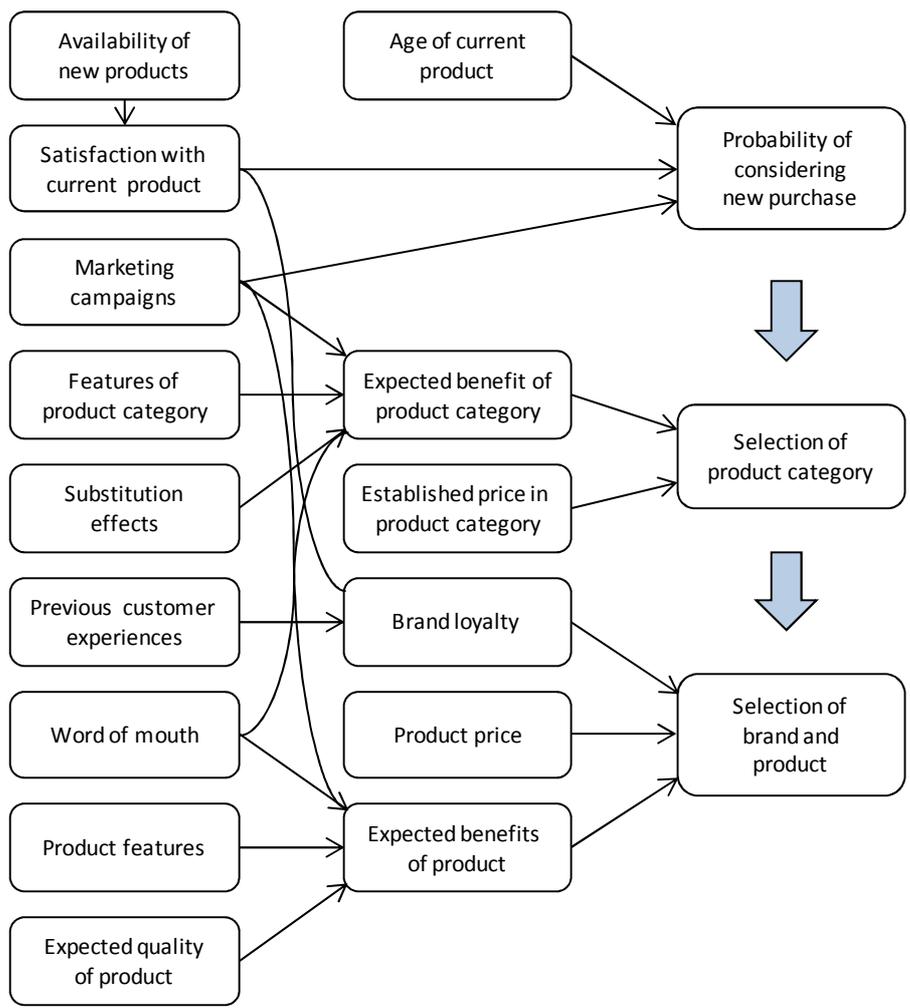


Figure C.3: Customer decision process in case of communications product with three main phases: decision to consider a new purchase, selection of product category, and selection of product.

Several issues affect the decisions at each of the phases. For instance, a marketing campaign may increase the probability that potential customers start to consider purchasing a new product.

Note also that there can be different kinds of strategies (see also Figure M.2). Some service providers might follow a strategy to minimize

churn: turnover of customers of a business or users of a service

rather than to attract a lot of new customers. The logic of this strategy is that customer retention is typically much less expensive than the acquisition of new customers. Service providers with small customer bases likely adopt a more aggressive strategy to attract new customers as fast as possible. Some providers may concentrate on the maximization of Average Revenue Per User (ARPU).

For modeling purposes, the effect of each aspect has to be expressed in numerical form. Satisfaction might be described by the Mean Opinion Score (MOS) scale discussed in Chapter U. Note that the satisfaction with the current device or product may decrease just because new, more advanced features have become available with the same price that the customers has bought the current less advanced device. As an output, the model gives estimation about share of customers (in each customer segment) that seriously considers purchasing a new product.

Typically, the campaigns try to persuade old customers to select a new product with more advanced features, that is, a new product category. The logic is that new phones with features are more expensive and thus may provide higher margins for the product vendor and the service provider in cases where the device is bundled with the communication service. Still some customers may decide not to change the current product category.

When customers consider changing the product category, they often need to take into account substitution effects. A smart phone might also be used as a camera, a game console, a music player, and a navigator. In that kind of case, the benefits of the new shall not be assessed only relative to the less advanced mobile phone, but relative to a situation in which some or all of those needs are fulfilled with special devices. Substitution effect makes, therefore, the modeling category selection very complicated.

In addition to marketing,

word of mouth: a process in which customers voluntarily tell other people how much they like a product or service

has a significant effect when people make decisions to adopt a new product category. It is much more difficult to assess the benefits of a product with new features without any self-experience than to select a new device with similar but improved properties. Thus, the opinions of friends about the benefits of a new product category are often necessary to initiate the adoption of new features. Sometimes a representative of the product vendor is trusted so much that he or she may have a similar effect as a close friend—but that requires a highly trusted brand.

Price is usually deemed as the main cost of a new product. However, one of the major messages of this book is that even when the prices of devices fall, customers should seriously consider the other sacrifices they need to make in order to get the expected benefits. The mental effort and time needed to learn the usage of new features might create so high a sacrifice that most of the potential benefits do not ever materialize. The analysis of this aspect belongs to the sphere of Chapter U, because if a customer has bought a product the main objective of the product vendor is apparently satisfied, at least in the short term.

Diffusion

Now let us discuss more generally about the process of diffusion of innovations. We may say that diffusion provides a holistic viewpoint that also embraces the general topography in addition to the trees and the forest. This type of approach requires both applicable tools and hard effort to keep the model consistent through several layers from individual decisions to the development of the whole ecosystem. An all-embracing simulation model, similar to global climate models, is possible but in practice difficult to develop and cumbersome to use.

Another type of scheme would be to read articles and books describing processes on each layer, and then to form a sort of common view in mind. Note that much of that personal view will remain in the unconscious part of mind, which means that the view can be used through intuition instead of conscious reasoning (see Figure H.1). Now I apply this intuitive scheme and utilize the insight gathered from various sources including the books recommended at the end of each chapter.

What kinds of conceptual frameworks do we have at hand? Certainly, we shall consider some of the frameworks explained by Everett Rogers. The objective here is, first of all, to include both the level of individual decisions, and the system level in which the main objective is to observe the number of customers, owners, or users as a function of time.

Diffusion terminology

Let us start with the general level of diffusion and consider how the attitudes towards innovations differ between different types of people. Rogers (2003, p. 281) uses the following categories to describe the diffusion of innovations:

innovator: a person that is actively seeking information about new ideas,

early adopter: a person who chooses to purchase or use an innovation before it is fully embraced by the mass market,

early majority: a group of people who adopt a new idea just before the average member of a social system,

late majority: a group of people who adopt a new idea just after the average member of a social system, and

laggard: a person that adopts an innovation later than a great majority of people in a social system.

Note, however, that the percentages used by Rogers (2.5, 13.5, 34, 34, 16) are directly drawn from normal distribution. We shall not assume, thus, any clear, fixed criteria that define the boundaries between the categories. Rather the assumption is that there is a continuum of personalities from innovators to laggards, even in a way that the classification of a person might vary considerable depending on the context. Moreover, if fixed criteria for each category are pre-defined then we shall not assume that the percentages remain constant.

Another similar but still different categorization is based on the role of a person in the process in which information about a product is created and disseminated within a social system. Malcolm Gladwell (2000, p. 34) uses the following names for three special types of people:

maven: a person that accumulates knowledge,

connector: a person with an extraordinary skill of making friends and acquaintances, and

salesman: a person with a special ability to persuade other people.

What is important to understand for a CEE is that an optimal community (here, from the viewpoint of diffusion) consists of different kinds of personalities, with different combinations of characters in the above described two dimensions. It might be that innovators are not usually salesmen and laggards rarely are mavens at least in case of communications devices. Then we can add as a third dimension the closeness of people in a way that was applied in Figure U.8. The combination of these three dimensions results in the illustration shown in Figure C.4. The main message of the figure is to stress the fact that successful diffusion of an innovation requires active participation of different people with different characteristics. Figure C.4 depicts a case in which the innovation is made within the community and diffused throughout the community. Another likely case is that an early-adopter-connector brings the innovation into the community. It is, of course, possible that the innovation is adopted only by a part of the community.

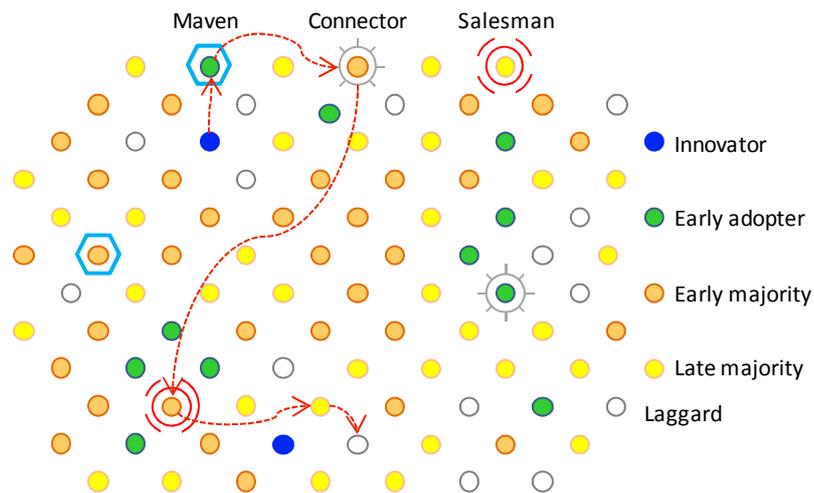


Figure C.4: Three dimensions related to diffusion of innovations: closeness, adopter category (Innovator, Early adopter, etc.), and specialty (Maven, Connector, and Salesman) with a path from the creation of innovation to the last adopters.

On an individual level Rogers (2003, p. 170) discerns the following phases of adopting an innovation:

- knowledge:** theoretical or practical understanding about a subject,
- persuasion:** a process in which someone tries to convince a person about the benefits of a decision,
- decision:** a choice made between alternative courses of action in a situation of uncertainty,
- implementation:** the act of providing a practical means for accomplishing something, and
- confirmation:** a process in which a person becomes convinced about the quality of a subject.

Tables C.1 and C.2 provide some preliminary ideas about the connections between the described categorizations above and other categories used in this book. Thus, the main objective of the tables is to demonstrate the connection between different kinds of frameworks.

We may also consider the relationship between activity theory (see Figure U.1) and the phases of adoption. Adoption may occur on different levels: in an extreme case, the adoption of a feature may happen on the level of operations without considerable conscious thinking. This may happen because of

- priming:** an effect in which exposure to a stimulus influences a response to a later stimulus,

exploited by vendors to promote their new products. For instance, a recurring exposure to effective advertisements may lead to a situation in which a consumer starts to buy a new product without any conscious thinking (see also Figure H.1). However, this kind of incident is more probable with products that belong to already known product categories. In contrast, the adoption of an innovation likely requires both the collection of knowledge and some external persuasion before the decision to either accept or reject the innovation can be made. In case of innovations with minor significance and sacrifice, these phases may remain on the level of actions.

In cases of innovations requiring considerable practice or other sacrifices, the adoption process likely needs a purposeful activity. We may assume that a shift from a simpler product category to a more complex category happens on the level of activity.

Then in another extremity, the adoption of an innovation may require a consciously selected mission. The first example in Rogers (2003, p. 1 - 5) "Water Boiling in a Peruvian Village: Diffusion That Failed" is illustrative. A successful adoption would have required not only a mission of individual inhabitant, but also a mission of the community as a whole. In general, diffusion of innovations significantly depends on network effects: in some cases, network effects are positive and accelerate the diffusion whereas in many cases there are strong negative network effects that make the start of the diffusion problematic.

Table C.1: Possible characteristics of people in different diffusion categories (see Table T.1).

	<i>Capability</i>	<i>Performance</i>	<i>Efficiency</i>	<i>Worth</i>
<i>Innovators may</i>	recognize the potential of novel features and capabilities, and			be willing to take risks even when the real merits of an innovation are unsure.
<i>Early adopters may</i>	require new features because of the social pressure in their own social group and	be primarily interested in doing something better than others do or what they have done previously.		
<i>Early majority may</i>		require that performance is without doubt better than previously and	be ready to take risks even when economical feasibility is somewhat unsure.	
<i>Late majority may</i>	dislike new features and		make a thorough benefit vs. cost analysis concentrating on economic aspects.	
<i>Laggards may</i>			consider all cost factors and sacrifices carefully and	want to be fully sure that an innovation is valuable before the innovation can be adopted.

Table C.2: Some speculation about the characteristics of mavens, connectors, and salesmen.

	<i>Layers of social groups and evolution</i> (see Figures U.8 and S.1)	<i>Intuition vs. reasoning</i> (see Figures H.1 and H.2)
<i>Mavens</i>	Specialization of skills and knowledge starts to be beneficial when the size of community exceeds certain limit (maybe between 50 or 100).	Building specialized knowledge means using reasoning and thinking to develop intuitive capabilities regarding both skills and knowledge.
<i>Connectors</i>	A small community can greatly benefit from a connector that is able to create and maintain links to other communities.	It might be that many connectors have an inborn ability to make friends; still, they may deliberately use their social networks as instruments to achieve personal benefits.
<i>Salesmen</i>	Harmonization of opinions and habits might be beneficial for a community.	The message of salesmen primarily influences the intuitive part of mind.

Diffusion models

There are two basic approaches to model the rate of diffusion. First, a researcher may observe how a real diffusion process evolves over a period. Then the researcher uses a mathematical model to approximate the observed process, including Gompertz and logistic functions. The limitation of this approach is that it just describes an observed chain of events without the possibility to answer “What would happen if” –types of questions. Secondly, it is possible to start with an idea about a process that leads to diffusion and then to model the idea using as realistic parameters as possible. This makes it possible to predict what will happen in case of controlled intervention.

Figure C.5 is based on a mathematical model in which people have different thresholds for adoption of an innovation. The threshold is defined as the required penetration of the innovation during the previous period. The process is essentially the same as what was used by Granovetter (1978) to describe the concept of critical mass (see Rogers 2003, p. 356). The domino effect also explains why some innovations will never succeed even though they might provide considerable long-term benefits. Because of random nature of the diffusion in the early phase sometimes the number innovators does not exceed the limit to entice enough early adopters to start the diffusion process. Then if the process goes beyond early adopters, it typically becomes self-sustaining.

The only difference between innovations A, B, and C in Figure C.5 is that there are somewhat more people that are willing to adopt the invention when a given number of people has already adopted the innovation. Even a small difference may generate significant change in the diffusion process as illustrated in Figure C.6. The persons are arranged in the order of their willingness to adopt an innovation. Innovators are on the left side of the graph, because they do not require that any other person has already adopted the innovation. On the right side of the graph are laggards that are willing to adopt the innovation only if almost everyone has already adopted the innovation. Note also that in this kind of model the diffusion will always stop if the N:th person requires more than N people to have already adopted. The termination may happen at any stage of the diffusion process.

Many other aspects affect the speed of the diffusion process. Particularly, speed of information spreading affects the speed of adoption. For instance, in agricultural cases there often is a natural delay of one year, because the decisions to adopt an innovation are made for each season. Furthermore, the cost to offer a product and the price for customers may decrease rapidly during the diffusion process. This is a typical situation in the case of information technology. The price of mobile phones has dropped continuously while the capabilities of the phones have improved.

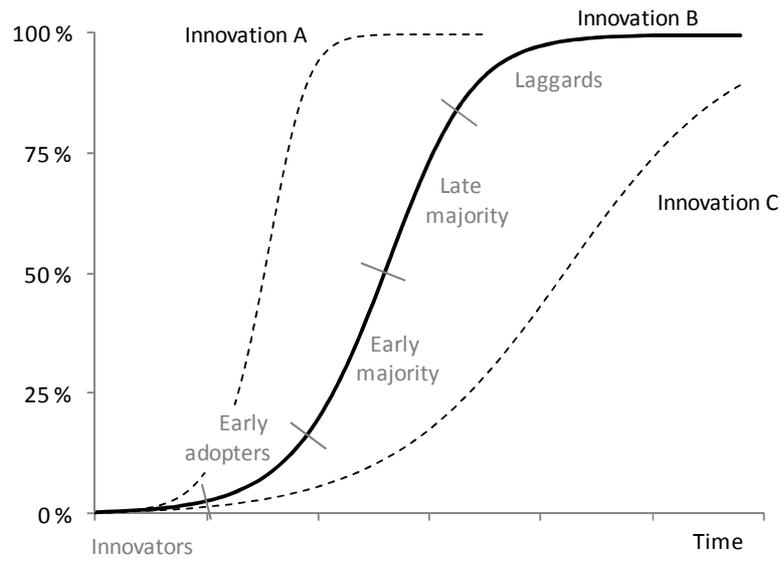


Figure C.5: Diffusion process of three innovations, adopter categories for innovation B. Take-off happens when early majority starts to adopt the innovation.

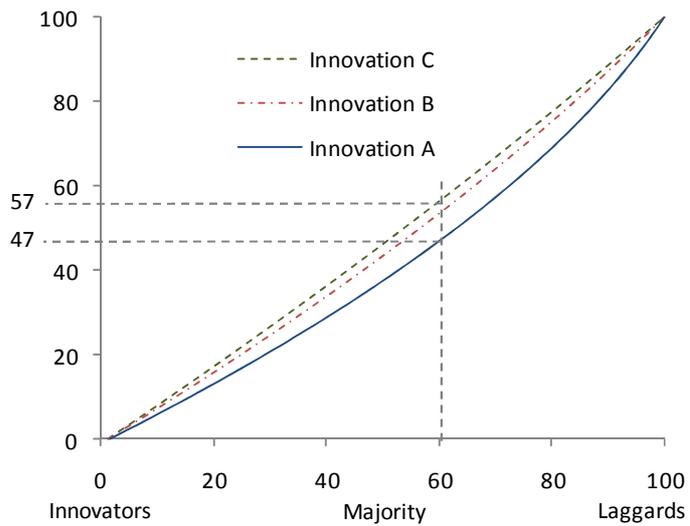


Figure C.6: Three innovations with different thresholds for adopting an innovation in a community of 100 people. In case C, the 60th person adopts the innovation if 57 persons have already adopted the innovation.

Long tail of popularity

One important aspect of customer behavior is the long tail of popularity distributions. Many product categories, such as books, movies, and music, consist of huge variety of items or titles: some items are very popular while some others entice only negligible demand. The popularity can be measured either by means of sold units or money, but in any case, it is often assumed that the more popular the better. Note, however, that although popularity is almost the only reasonable metric to assess creative products, the popularity order depends critically on the people who are allowed to express their opinions.

As an example, professional critics may seek acceptance in their own community. This may even lead to contempt towards products that are too popular, because critics cannot have a central role in the definition of the most popular products. Then there are people that are personally tied to the business based on artistic creations; it is difficult to be totally unbiased when one's own career depends on the fate of some business players, like movie studios. In a way, the most honest opinion is expressed when a person buys an artistic product like a ticket to a concert or a book.

However, if we want to keep an outsider perspective, we should not automatically assume that more popular is better, even in cases where customers are free to select what they buy and the markets are free to offer all kinds of products. Even less so, we shall not automatically assume that the most popular item in each category is the best for the society—it might be best for the business of the product vendor but that is another perspective and other metrics. Maybe, you may also examine the reasonability of the metrics of diversity: the longer the tail the better!

Nevertheless, long tails are an interesting and relevant topic from the viewpoint of a CEE. As a starting point, you may read Chris Anderson's book (2006) about the Long tail or look at the various examples shown in Kilkki (2007). Osterwalder and Pigneur (2010) also include a section about business models utilizing the long tail phenomenon. The aim of this section is to provide some general insight about the usefulness and applications of some long tail models. Let us start with the following questions:

- What kind of function is able to describe a long tail most accurately?
- Is the same distribution valid in all kinds of cases?
- How many parameters are needed to illustrate a typical long tail?
- Can the distribution be used to make predictions about the customer behavior in addition to the descriptive use?
- What kind of function is easiest to use in practical tasks?

According to my experience, at least three parameters are required to describe any long tail:

- A parameter for the total size of the popularity, e.g., measured by the total number of sold items (sometimes the distribution can be scaled to 1, but not always, because we do not necessarily know the whole volume of popularity or business).

- A parameter for the length of the distribution, or actually, a kind of center of the distribution to describe how many items are needed to cover a majority of popularity.
- A parameter that describes the form of the distribution, because even if the size and “length” of the distribution were the same, two long tails may differ considerable from each other.

Depending on the properties of the function, the selected parameters do not necessarily have any intuitive interpretation as described above. Even then, it is practically impossible to fit real long tail data to a function with two parameters. In addition, we quite often need one (or maybe two) additional parameter(s) to describe the point where the tail ends in practice. No real tail, however, continues to infinity as the mathematical functions used to do, but real tails are cut at some point. We return to this cutting issue later and start with three parameters.

Let us start with a case without any clear business applications, namely, the frequency of words. Wiktionary provides interesting data about the frequency of words (http://en.wiktionary.org/wiki/Wiktionary:Frequency_lists). For instance, Table C.3 shows the frequency of some words in TV and movie scripts. The first 100 words are apparently all closely related to social relationships, starting with you and I—not a big surprise. Money is 268th, reason is 385th, and ecosystem is 24085th on the list.

Table C.3: Popularity of words in TV and movie scripts.

<i>Rank</i>	<i>Word</i>	<i>Number of occurrence</i>
1	you	1 222 421
2	I	1 052 546
3	to	823 661
4	the	770 161
5	a	563 578
10	me	312 326
100	ok	49 968
1 000	worst	2 276
10 000	misjudged	77
40 000	imperious	6

Because the distribution is long with over 40 000 words with at least six occurrences, it is not reasonable to show the whole distribution on a linear scale. Thus, the horizontal axis shall be logarithmic. Yet we need to remember the peculiar properties of a logarithmic scale when we make inferences from the figures. As to the vertical axis, we have two main options: the chart may show either the sales of individual items on a log-log-scale or the cumulative share of the k most popular items. Both types of figure are useful illustrations.

In addition to plotting the raw data, we need mathematical models to make any further analysis. A typical choice for this kind of model is the Zipf-Mandelbrot distribution:

$$f(k; N, q, s) = \frac{1/(k+q)^s}{\sum_{i=1}^N \frac{1}{(k+q)^s}}. \quad (C.1)$$

Note that q shall be larger than zero to make the distribution realistic. A distribution with $q = 0$, known as a Power law, is not suitable for describing real popularity distributions in the format illustrated in Table C.3 (that is, when items are organized in the order of popularity).

However, the same data could be modeled in a different way by means of a distribution giving the probability that a randomly selected title will have a given level of popularity. We may ask: what is the probability that the yearly sales of a randomly selected book title will be exactly 1000? The same data, for instance the frequency of words, can be presented in that way. The result typically seems to be a distribution in which the tail obeys a power law, that is, $P(x) \sim c/x^s$, where x is the popularity of the item, c is constant and $P(x)$ is the probability that popularity would be x . This phenomenon, however, does not mean that the long tail presented in the rank order would obey a power law. If you come across data with a long tail and then someone claims that the long tail obeys a power law, always check whether the data is presented in the popularity order or whether it is presented as a probability distribution. The standpoint of this book is that popularity distributions should be primarily presented in the popularity order.

Even though Formula C.1 is popular and it describes accurately many popularity distributions, it also poses some shortcomings. First, parameters q and s are not illustrative and do not provide any intuitive interpretation. Moreover, if the tail is long, it is a bit tedious to calculate the sum of N terms. Thus, in this book, the function applied for long tail distribution is:

$$F(k; \alpha, \beta, N_{50}) = \frac{\beta}{1 + \left(\frac{N_{50}}{k}\right)^\alpha} \quad (C.2)$$

where:

- $F(k)$ = the popularity covered by items up to rank k ,
- N_{50} = the number of items that cover half of the total popularity or volume,
- α = the factor that defines the form of the function, and
- β = total volume of all items.

The popularity of k^{th} item can then be easily calculated as the difference between the consecutive cumulative values: $f(k) = F(k) - F(k-1)$ in Formula C.2. The share of the most popular item $f(1)$ is defined as $F(1)$.

Figure C.7 and Figure C.8 show the cumulative and frequency distributions, respectively, both for TV and movie script data and the long tail model. In this case, the long tail model works well through the whole tail. This is a somewhat unusual example in which there is no obvious cost of favoring even a very rare object (that is, an uncommon word), except possible misunderstanding. Thus, the result is a “natural” form of a long tail. Actually, the biggest difference between the data and the model is that the model predicts a larger difference between the two first words. Thus, according to the long tail model, “you” should be more popular and “I” should be less popular than what they are in reality. The parameters of the long tail model are $N_{50} = 65$, $\alpha = 0.68$. Indeed, only 63 words (you, I, to, ... , one) are needed to make up half of everything said on TV (there is a small difference between the real data and the model in this respect).

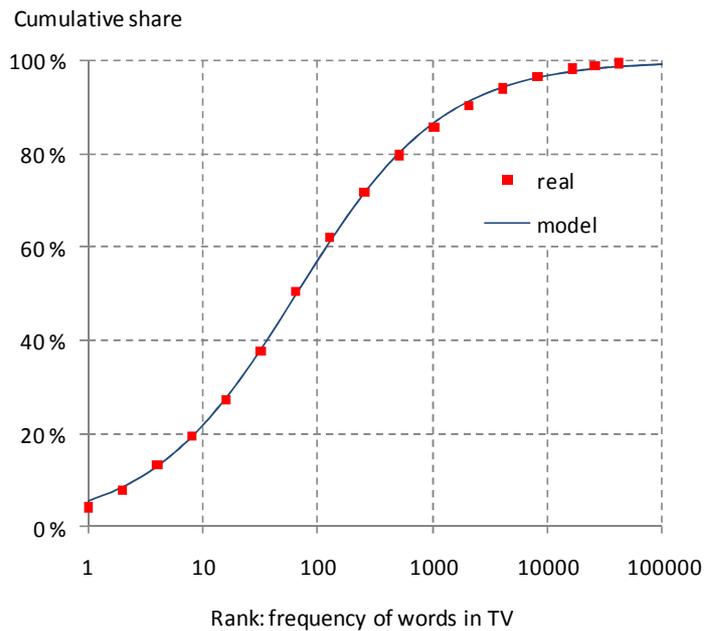


Figure C.7: Cumulative distribution of words used in TV in popularity order.

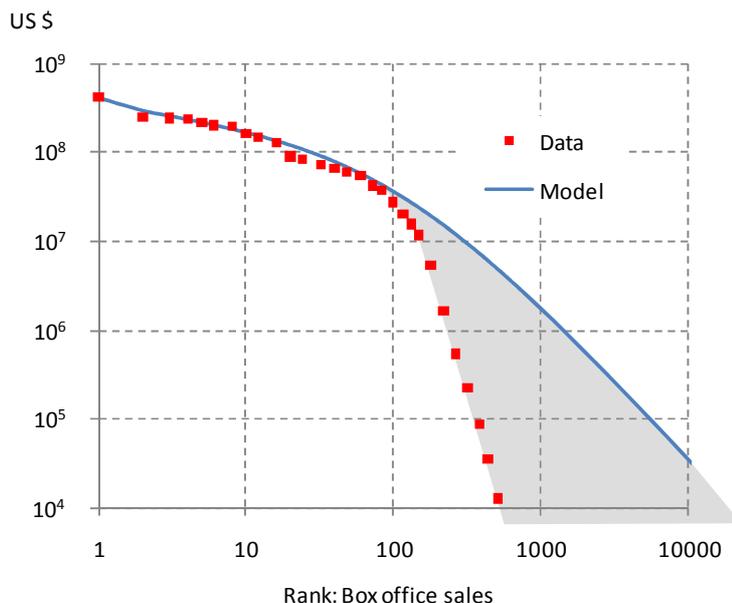


Figure C.8: Popularity distribution in TV and movie scripts.

As the figure shows the fitting is excellent for this set of data. Thus, in this case the result does not depend on the fitting algorithm: fitting can be done for the cumulative distribution or for the popularity distribution and data points can be weighted in different way. In typical cases with less perfect fitting between data and the long tail model, fitting shall be designed more carefully. The application of the model is not always as easy as in this case.

Some practical advice might be useful if you want apply the model. Parameter α is a kind of form parameter describing the importance of the ends of the tail, in most cases α shall take values between 0.5 and 1. If α is large (above 0.9), the middle part of the distribution is more pronounced. If we keep N_{50} fixed, the most popular items becomes less popular when α gets bigger. At the same time, the end of the tail becomes thinner when α gets bigger. Actually, the cumulative distribution presented in a logarithmic scale is symmetric as to the point $(N_{50}, 0.5)$ except the fact the there is not any more popular item than the most popular item! With real products this phenomena is rarely true, because the tail is typically shortened due to various reasons. Correspondingly, if α is small (below 0.6), the middle part of the distribution is less important, wherein there are both a small number of exceptionally popular items, and a very large number of less popular items that together represent a significant amount of popularity.

As a rule α shall not exceed 1. However, if N_{50} is small, α can even be little bit over 1. In those cases, one has to be careful to avoid using a distribution in which the item with rank of 1 is less popular than the second item.

We may present a hypothesis that the value of α is relatively constant when we observe distributions within one domain. In case of movies during one year α could be about 0.85 whereas for books α could as low as 0.5.

In practice, the most challenging problem is the unlimited coverage of the data. If the data covers only the most popular items but not the popularity of items above $N_{50\%}$ and if the total amount of popularity is not known, the estimation of parameters becomes inaccurate. Although the long tail distribution is mathematically simple, proper usage of the model and particularly real data fitting needs lots of experimentation and careful thinking because different models and interpretations are possible and even feasible.

The long tail of box office sale

One of the important phenomena that the long tail formula does not take into account is that the popularity distributions are often significantly shortened because of various reasons, often related to the business logic and environment. An illustrative example is the movies shown in movie theaters. Let us take as an example the box office sales in the United States in 2006, with total gross sales of about 9 billion dollars and 608 movies. Table C.4 shows the five most popular movies and some other examples.

Table C.4: Box office sales in the United States in 2006.

<i>Rank</i>	<i>Title</i>	<i>Sales (US \$)</i>
1	Pirates of the Caribbean: Dead Man's Chest	423 315 812
2	Night at the Museum	250 728 235
3	Cars	244 082 982
4	X-Men: The Last Stand	234 362 462
5	The Da Vinci Code	217 536 138
10	The Pursuit of Happyness	163 566 459
20	Scary Movie 4	90 710 620
50	The Good Shepherd	59 908 565
100	Deep Sea 3-D (IMAX)	27 476 704
200	Half Nelson	2 697 938
500	No Restraint	16 136

This list clearly demonstrates the difference between popularity, quality, and importance, at least if the quality is measured as the success in Oscar nominations. The best picture award winner *The Departed* was 8th on the box office list, while the most relevant film from the perspective of this book (*The Pursuit of Happyness*) was tenth. The whole distribution of box office sales is shown in Figure C.9.

There are several practical questions to be considered:

- Is it feasible to give the same weight for all data points (in this case, movies)? If yes, then the movies from 500 – 510 are deemed as important as the 10 most popular movie from the modeling viewpoint. Is that reasonable?
- If the curve makes a clear turn at some point, as in the case of movies around the rank of 100, then we may ask: what data points shall be used, only the beginning of the tail or the whole set of data points?
- Is it better to consider absolute or relative differences? Is the difference between 20 000 units and 10 000 units as big as the difference between 1 000 000 units and 1 010 000 units, or perhaps between 1 000 000 units and 2 000 000 units?
- Should the fitting be done for the cumulative or popularity distribution, or both?

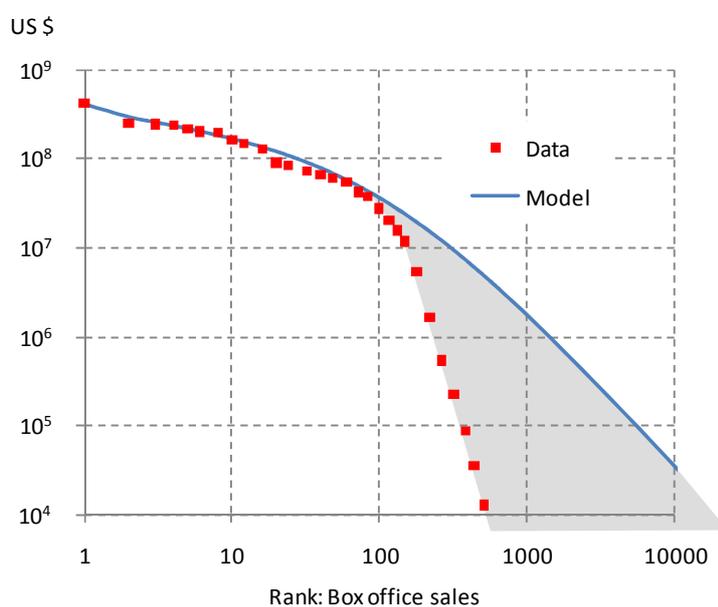


Figure C.9: Box office sales in US 2006 with a potential business for less popular movies.

These are mostly non-mathematical questions and belong to the area of scientific knowledge or personal insight (see also Figure A.1). Best practices may also vary depending on the particular properties of each case. However, my tentative advices based on some tens of cases

of long tails are as follows: Weights shall be distributed evenly on a logarithmic scale, that is, item from 10 to 100 are given as much weight as items from 100 to 1000. This can be done, for instance, by only including items with rank of 1, 2, 4, 8, 16, 32, etc., because those items are equally distributed on a logarithmic scale.

In addition, it might be reasonable to omit one or a couple of items with the highest rank from the fitting procedure. Although this approach is from a “mathematical” viewpoint questionable, in many cases the form of the beginning of the tail is somewhat odd and, thus, does not fit to the “smooth” form of the long tail model. It might be better to leave that region out of the fitting process rather than to end up with a model that does not fit the data anywhere.

As to abrupt turns, the long tail (without any modification) can be used only in the region from the beginning to the turn. For instance, in the case of movies, only data points up to 80 were used. The turning point has to be explained separately.

Because the popularities (e.g., box office sales) typically stretch over several orders of magnitude, it seems reasonable to minimize relative errors rather than absolute errors. In general, if logarithmic scale is used for illustration purposes, errors shall be also calculated on the logarithmic scale (which is essentially the same as using relative errors). For cumulative distributions, absolute errors are more reasonable.

Both popularity and cumulative distributions can be used in the fitting procedure. In the best case, you can find model that fits both accurately (as in the case of TV and movie words). On the contrary, if the beginning of the tail is weird, the result may differ considerably. In those cases, I recommend using the popularity distribution to estimate the model parameters over the most regular region of data.

Finally, let us consider the box office sales data more closely. My assumption is that the abrupt turn of the tail can be explained by two phenomena:

1. The number of movies that are able to gain wide publicity at the same time is quite limited. Roughly speaking, if a typical (popular) movie gets public attention for 3 weeks and if there are 6 movies discussed at the same time by a wide audience, the results is about 100 popular movies per year. All others are more or less neglected.
2. The movie business is much more profitable for the most popular movies than for the less popular movies. One aspect is that the cost per viewer is obviously higher if there are only a couple viewers than if there are, let say, 100 viewers per showing.

Thus, there is a strong pressure to identify those 100 movies, concentrate the marketing to them and present them on as many screens as possible. Obviously, this process seems to be particularly efficient in the United States. As a side effect, those movies that are powerfully marketed in the US tend to get attention in almost all other markets as well. This may partly explain the difference between US and Europe: the 100 most popular US movies will inevitably get attention in Europe as well, but in addition to those movies, there are always local movies that extend the tail of movies.

Then there is the question whether some business opportunity is truly lost because of the abrupt turn of the tail. There seemingly is a grey area between realized box office sales and the

“natural” demand shown in Figure C.9. The size of the grey area is about 87 percent of the current business. One “prediction” of the long tail model is that there should have been about 1400 movies with box office sales above 1 million US dollars instead of the 157 movies that reached that target in 2006. Maybe, maybe not.

We may speculate that what is truly lost is the missed opportunity of serving the specific needs of large minorities. If we consider the true mass market, it might be that the efficient marketing just concentrates the demand on a limited number of movies, but that the process does not necessarily reduce significantly the total demand: someone just intentionally shift demand from less popular movies to the more popular movies. This is the natural viewpoint of large film studios. Still, this process leaves a considerable opportunity for smaller players in niche markets.

What the combination of the original and the modified long tail curves actually claim is that if the use of the resources (including marketing and allocation of movie screens) is distributed more evenly, the tail of movies would be much longer. That sort of even allocation is, of course, not realistic in the current business model, but may happen if movies were distributed freely through Internet, marketed through peer to peer networks, and watched in home theaters.

Lessons for CEE

The attraction of new products is a necessary phenomenon to keep all kinds of business going on and progressing. When a new product serves some real needs of customers and is able to improve their lives, there is hardly any reason to criticize any sensible marketing effort. This is the first rule for a CEE: remember the human benefit.

Nonetheless, it is not clear that positive emotions related to the incident of buying imply long-term benefit for the customer. We tend to think and feel that if we just could reach certain goals (a perfect apartment, partner, or job, etc.), we would become *permanently* happy. Yet, the strongest emotion is typically linked to the very moment of change from not having to having. That is an ephemeral moment. On the contrary, it is difficult to assess the effect of apartment in the long run without comparing it with the current apartment. Moreover, when we compare, we tend to return to the moment of change.

Remember also the fact that external circumstances have only a minor effect on the variation in happiness between people within a society. If a person trusts on the ability of new products, partners, and jobs to boost his or her happiness, he or she needs to continuously seek something new. That could be beneficial for some businesses and the economy of the society, but hardly beneficial for the person. Thus as an expert you must provide an objective assessment about the long-term effects of anything new in a realistic situation. The concepts of sense of coping and sense of significance might be useful in that task.

That does not mean, of course, that it would always be futile to change apartments, partners, or jobs. All of them, and many similar things, could be so miserable that changing is the most reasonable thing to do. However, then we shall remember the “bad is stronger than good” phenomenon: getting rid of a destructive thing may indeed remove some negative

emotions, but that does not guarantee that those emotions would be replaced, at least permanently, by positive emotions.

Remember the other rules as well. Even if a product might be truly beneficial for a person, the product might still have a negative effect on the well-being of other people. Those effects are often disseminated among various other people and obscured by complex interactions within the ecosystem. Still the negative consequences might altogether be stronger than the benefits obtained by the person buying the product. As an example, a father of small children might buy a product that requires a lot of time during weekends, let say, a golf share due to a successful marketing campaign of a golf club. Golf might genuinely increase the happiness of the man; however, it might have a negative effect on the other members of the family, unless they are somehow able to participate in the new hobby. In addition, the construction of new golf courses might have negative environmental consequences that affect numerous other people. An ecosystem expert must spend a considerable effort to analyze all these systemic effects in a balanced manner.

Finally, I would like to quote Craig Holdrege cited by Steve Talbott (2004, p. 44):

“You can do anything as long as you take responsibility for it.”

However, if we want to make this rule acceptable, responsibility must be taken very seriously, which also means that deep conversations with everyone involved is needed. In the framework of this book, responsibility essentially means that you are allowed to improve your own eudemony by means of any action if you can be sure that the action increases the total eudemony of the society. There is no invisible hand that would magically convert a detrimental action to a beneficial action even when the action is made according to the rules of free market. This is a particularly important aspect when a person gives professional advice to powerful organizations.

Book recommendations

B. Gilbreath, 2010, *The Next Evolution of Marketing*, New York: McGraw-Hill.

Marketing does not belong to my core competences. Still, it is critical when new products are brought to the market. This is the most relevant book about marketing I have found and perhaps the only one that is in line with seven rules for communications ecosystem experts. Especially I appreciate those examples in which Gilbreath's objective of providing true benefits through meaningful marketing seem to materialize.

M. Gladwell, 2000, *The Tipping Point*, New York: Back Bay Books.

Malcolm Gladwell has a long career as a prominent science writer. He has the rare capability of condensing a complex issue in the form of a seemingly simple concept. The tipping point is the moment when an idea crosses the threshold and starts to

spread exponentially. This is exactly what most agents in the communications ecosystem are seeking.

E. M. Rogers, 2003, *Diffusion of Innovations*, Fifth (paperback) ed., New York: Free Press.

This book is a mandatory reading for anyone who wants to understand the diffusion of innovations. Everett Rogers provides plenty of solid examples that clarify the complex process of diffusion. The examples and the inferences made based on the examples can help communications ecosystem experts, for instance, when they try to accelerate the diffusion of a new communication products or applications.

References

- Anderson, C., 2006, *The Long Tail: How Endless Choice is Creating Unlimited Demand*, London: Random House.
- Blackshaw, P., 2008, *Satisfied Customers Tell Three Friends, Angry Customers Tell 3,000*, New York: Random House.
- Fornell, C., 2007, *The Satisfied Customer*, New York: Palgrave Macmillan.
- Granovetter, M., 1978, Threshold models of collective behavior, *The American Journal of Sociology*, 83(6): 1420-1443.
- Kilkki, K., 2007, A Practical Model for Analyzing Long Tails, *First Monday*, 12(5).
- Kivi, A., T. Smura and J. Töyli, 2012, Technology product evolution and the diffusion of new product features, *Technology Forecasting and Social Science*, 70(1): 107-126.
- Odlyzko, A. M., 2001, Content is not king, *First Monday*, 6(2).
- Osterwalder, A., Y. Pigneur, 2010, *Business Model Generation*, Hoboken, NJ: John Wiley & Sons.