CHALLENGES OF TOTAL CUSTOMER EXPERIENCE (TCX) MEASUREMENT: ARE TOUCHPOINTS ENOUGH?

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Abstract: *Customer Experience (CX) is an already known term and is usually measured at one or more "touch points". A touchpoint refers to the direct and indirect interaction between the customer and the company. A customer and a company can have more than one touchpoint. Most companies typically use these touchpoint measurements as a representation for the total customer experience (TCX). But one can argue that this representation is inadequate, since customer experience is also determined by what is experienced before, between and after touchpoints, which define the whole customer journey. In addition, we also see many companies using traditional methods for CX measurement, resulting in possibly incorrect indicators for TCX. The current paper discusses the adequacy of TCX measured only through touchpoints, introduces possible new directions for measuring this TCX referring to the total customer's journey, and discusses a possible contribution of Digital Customization into TCX measurement.*

Key Words: *Customer Experience (CX), Total Customer Experience (TCX), Touchpoints, In-between Touchpoints, Digital Customization*

1. INTRODUCTION

Customer Experience (CX) refers to customer's impression, which is formed after customer's interaction with company's assets, such as products, services, employees, facilities, business etc. Products as just solutions are not enough to satisfy a customer, but a full package of support and services is need, which includes the whole experience of approaching a customer, such as sales, services, contact, financial convenience and the whole business in general are significant [1]. Before that, Consumption Experience was approached to address issues, such as "the role of aesthetics products, multisensory aspects of product enjoyment, the syntactic dimensions of communications, time budgeting in pursuit of pleasure, product related fantasies and imagery, feelings arise from consumption, and the role of play and providing enjoyment and fun". A further research should consider "Customers' fantasies, feelings, and fun" satisfaction and performance [2]. After some years, a new term to describe the economy behind CX is conceived, named Experience Economy [3]. A new kind of thinking and investing on customer's impressions and

emotions and feelings through his/her experience is introduced [4]. Total experience is needed to achieve the business goal of winning and retaining customers's trust [5]. Furthermore, co-creation experiences are studied concerning value co-creation as one more factor for CX [6] [7]. Service Experience are considered as another factor named Service CX, which consisted of functional, mechanic and humanic clues and they influence the rational and emotional perceptions of customers [8].

A Total Customer Experience (TCX) should include an emotional connection with customers, which differentiates an organization from competition [9]. Emotions are referred once again for CX. An experience should provide sensory, emotional, cognitive, behavioural and rational values [10]. CX is the outcome of direct interaction between customer and company, which creates a physical performance through stimulating the senses and evoking emotions across the whole contact [11]. The relationship between customer and company is evolutionary, which provokes rational, emotional, sensorial, physical and spiritual reactions [12]. "All experiences are consumption experiences", which causes something between pleasure and displeasure [13]. CX is approached as a process of "ongoing perceptions, feelings and direct observation" and "accumulation of knowledge, skills, emotions, sensations and attitudes [14] [15].

Management of CX should recognize all the right needs, which customer wants, through clues, which exist through a buying process, and understand them and transform them into clues, which create values for customer [8] [16]. CX management should understand customer's journey, which means to understand the expectations a customer has before the journey and the assessment, which is done by the customer when the journey is over. Experiential marketing is conceived to manage CX and five ways are proposed to engage a customer: sense, feel, react, think, act and relate [10]. The same researcher suggests five steps for CX management: "analyse the experiential world of the customer, building the experiential world of customer, building experiential platform, designing the brand experience, structuring the customer interface and engaging in continuous innovation" [17]. There are four steps for CX and user experience management which requires lifecycle touchpoints: plan for CX, build a "value proposition

experiential platform", develop customer interfaces and lifecycle touchpoints, assess and improve [18].

A further and deeper research on conceptualization and validation of CX, management of Total CX and CX metrics is needed [28]. Apart from that, the following managerial implications are issued [19]:

a) CX is a tool to achieve competitive advantage and it can be considered and managed as a holistic strategic process.

b) Managers should understand CX in terms of co-creation process.

c) Effective management of CX can be established through mapping of experiential process or customer touchpoints and designing strategies for customer's perceptions and needs.

d) Managers should measure CX and they can choose to use an already known/standardized metric or to develop tailored made metrics on their own, which suits to their case.

Digital Customization takes part mostly during Touchpoints. Companies use technology for Digital Customization during Touchpoints, therefore Touchpoints is an important platform and a mean to influence customer's journey and its outcome of customer's satisfaction. A question in this work is how Digital Customization can help the market capture TCX and by which means?

By following the previous issues, this work expands some of the implications, analyses them in detail, proposes solutions and introduces new ideas for TCX as a process, manages and measures TCX as a process. Moreover, this paper focuses on Customer's emotions and feelings, giving a new approach to CX for TCX. It concerns issues not only during touchpoints, but In-between Touchpoints, before the initial and after the last touchpoint, and forms a new approach for TCX without provoking or challenging old approaches. As it is mentioned before, managers can choose already known and/or self-defined metrics for their own cases. The goal is to use convenient, sufficient and effective tools and metrics for their own purpose.

The second section refers to the research methodology and mentions the challenges of defining TCX. The third section mentions the challenges of modelling and measuring TCX. The fourth section mentions the challenges of managing and improving TCX. Finally, the fifth section consists of the conclusion and future research directions.

2. RESEARCH METHODOLOGY AND CHALLENGES OF DEFINING TCX

CX is defined by the experience of a customer in a specific time moment in a specific location under specific circumstances and is influenced through specific events and actions [29]. These describe a touchpoint between customer and company's assets. Are the touchpoints enough to define CX? Is CX shaped and influenced by other actions, other circumstances, which happen not during touchpoints and therefore, in another place and other time. Do those non-touchpoint moments and circumstances influence CX? The whole customer journey influences CX and not only touchpoints,

including search, purchase, consumption and after-sales phases [34] [35]. To answer to those questions, we define a new model for TCX and we introduce the "In-between Touchpoints" as the time period, which is defined between 2 Touchpoints. By following the same idea, we define as Initiation the time period before the first Touchpoint and Finalization as the time period after the last Touchpoint. Customer's journey consists of the following periods, which define TCX:

1. Initiation
2. Touchpoints
3. In-between Touchpoints
4. Finalization

2.1. Initiation

The Initiation refers not only to the time period before the first Touchpoint, but also to all those factors and circumstances, which influence customer's opinion, satisfaction and the whole journey. As an example, the Initiation is the existence of a new customer's need or the recalling of an old customer's need to solve an issue. During this period customer realises his/her need, he acknowledges the need to satisfy his/her need and start to seek for solutions, companies, retailers, products or services.

2.2. Touchpoints

A Touchpoint is the already known and well-defined time point, when a customer interacts with a company or assets of a company and it is usually the shortest time period of customer's journey. Not all of the Touchpoints are equally significant for customers, according to a case study [49]. During a Touchpoint, technological applications play an important role. Digital Customization tools such as intelligence query platforms, options evaluation tools, configurators, concurrent and co-design platforms and others can be used.

2.3. In-between Touchpoints

The time period between two Touchpoints is defined as In-between Touchpoint. The reason of defining it is to highlight the significance of the time period between two Touchpoints, which usually is the longest time period of customer's journey. From one Touchpoint to the next one many issues can change and influence customer's opinion, feelings, satisfaction and finally journey's outcome. An In-between Touchpoint is quite risky for a company because there is no any interaction between customer and company, so it is difficult to establish a direct influence on the customer. A company's asset can be used by the customer, but the asset cannot respond and adapt to any change, which can be required by the customer. A company's target should be to find ways to provide a respond to the customer and a self-adaptation for its assets, for example an online platform, which provides data of company's assets specifications, including products, services and other desired attributes or solutions.

2.4. Finalization

The last time period refers to the period, when a customer has fulfilled his direct interaction with assets of a company, he/she has purchased the product or the service and he/she can use it. The only interaction is the interaction between customer and product or service till

disposal and recycling, which is the last phase of its lifecycle. After-sale services such as maintenance or update are considered as Touchpoints.

We introduce a new attributes segmentation of customer's journey, see below figure 1. The reason is to analyse customer's journey in detail, to conceptualize TCX, to identify further challenges of modelling, measuring and managing TCX and by which methods and means.
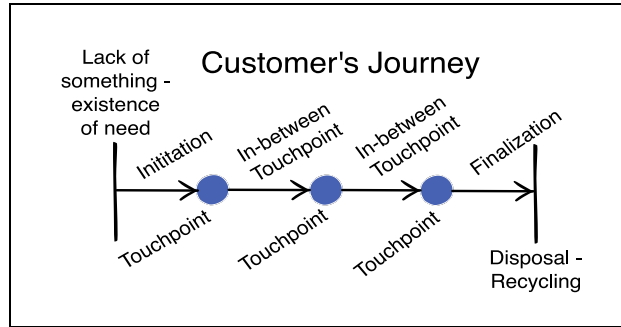

Fig. 1. *Customer's Journey*

3. CHALLENGES OF MODELING AND MEASURING TCX

How can we measure experience and by which means? According to the literature, CX can be measured through touchpoints, where customer interacts with company's assets. There are already many known metrics, such as Net Promoter Score [20], experiential value scale [21], brand experience scale [22], experience quality scale [23], Customer Experience Index - CEI [24], service experience quality scale - EXQ [25], retail customer experience scale [26] or using Quality Management tools to measure CX[48]. Other researchers argue that qualitative research is the only approach to measure CX [30] [31] [32]. But all of them are metrics, which measure CX only during Touchpoints and not TCX.

The key question in this paper is if measuring CX only during touchpoints captures and reveals the real CX. The questions, which we set in order to address, understand and to attach to the challenges of modelling and measuring TCX follow.

Do only touchpoints shape TCX? Why do not we search and measure In-between Touchpoints, too? Such an approach does not exist according to a literature review. Would a possible outcome of such TCX measurement be a result through a function including Touchpoints, In-between Touchpoints, Initiation and Finalization of customer's journey? Would be such an outcome measurable? Should the In-between Touchpoints be many or should they last long in customer's journey? Would it be optimal to achieve customer's satisfaction in only one Touchpoint without any In-between Touchpoints at all?

A customer wants a solution, such as a product or a service or information for some reasons. Do these reasons shape or influence CX? When a customer receives, and uses a product or a service, he/she is influenced by that. Therefore, CX is influenced and changed. How can we measure this change? The Kano model measures and maps customer's satisfaction and solutions' implementation for the customer [36] [37]. Satisfaction changes from the beginning of customer's

journey till the end, which is the end of product's or service's lifecycle. Target of a company is to satisfy customer by providing a solution (product or service) to his/her issue. Customer's satisfaction is built through time and TCX is influenced through different stages of value creation, such as Value in pre-use stage, Value in use stage and Value in post-use stage [19].

Do customer's feelings and emotions influence his/her experience? Would it be possible to measure feelings and emotions, although such an action can lead into wrong results because it is a problematic action [28]? By which means can we overcome a problematic measurement? It is a fact that human reactions and signals can drive to wrong results, how can we break them through?

Metrics for measuring emotions already exist such as Emotions Profile Index - EPI [40], Differential Emotions Scale – DES [41], Positive and negative affect schedule – PANAS [42], Pleasure – Arousal – Dominance (PAD) [43], Evaluative Space Grid [44], Consumption Emotions Set – CES [45], Self-Assessment Manikin – SAM [46] and Product Emotion Measurement Instrument – PrEmo [47].

We introduce a theory for TCX and the following TCX model to measure TCX through customer's journey. The theory is based on capturing customer's status by capturing his/her emotions over customer's journey time. Emotions are captured over time and analysed by using the hierarchy of consumer emotions [38]. The following Table 1 shows the scale by which emotions are organized and categorized in the TCX model.

Table 1. *TCX model scale for emotions*

Scale	Affect	Emotion	Emotional status
4	Positive	Pride	Pride
3		Love	Sexy, Romantic, Passionate, Loving, Sentimental, Warm-hearted
2		Happiness	Optimistic, Encouraged, Hopeful, Pleased, Joyful, Relieved, Thrilled, Enthusiastic
1		Contentment	Contented, Fulfilled Peaceful
0	Neutral	No emotion	Neutral
-1	Negative	Shame	Embarrassed, Ashamed, Humiliated
-2		Sadness	Depressed, Sad, Miserable, Nostalgia, Guilty
-3		Fear	Scared, Afraid, Panicky, Nervous, Worried, Tense
-4		Anger	Angry, Frustrated, Irritated, Unfulfilled, Discontented, Envious, Jealous

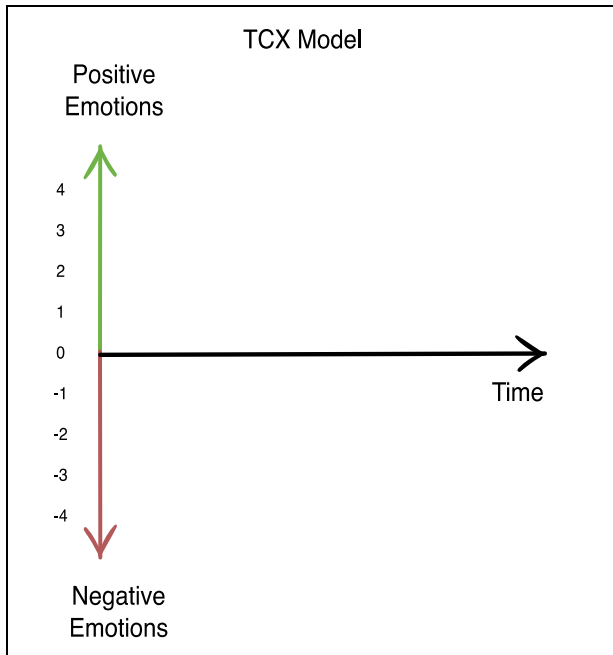The TCX model is shown below, figure 2.

Fig. 2. *TCX model*

By performing a graph analysis for TCX the following graph as an example could be explained as capturing emotions and presenting them in a time scale diagram, figure 3. The time points in the TCX model when emotions are captured are Initialization, the Touchpoints, In-between Touchpoints and Finalization. Technological means are needed to capture those data not only during a Touchpoint but also during the other time periods in customer's journey. The trend in the graph shows a logarithmic progress and it should be for many reasons, which are analysed below.
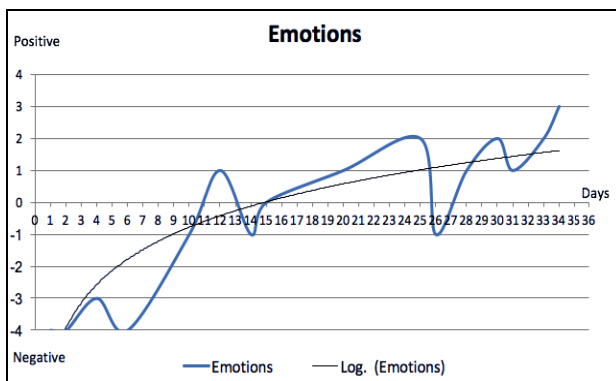

Fig. 3. *Example of TCX model*

A logical and normal progress of emotions over time during customer's journey could be as follows. At the beginning of customer's journey (1st and 2nd day), customer feels an absence of something, which affects him/her negative and the scale could be at (-4) with the emotion of anger. He/she is upset because he/she has needs and they must be fulfilled. Then he/she starts to seek for solutions (4th day), such as a product or a service or just a company. This seeking process improves his/her emotional status, but fear of not finding a good solution exists as a feeling. The next escalation could lead into

anger again because he/she still cannot fulfil his/her needs (6th day). We name this phenomenon as emotional decrease, which means a decrease in the scale from a negative to a more negative or from positive to less positive or from positive to neutral and negative status. Later there could be sadness and then shame when he/she expresses his/her needs to someone or to a company's agent (10th day). The neutral phase is revealed when logic thoughts about a decision on possible solutions are created (11th day). The positive scale starts with contentment and it could be expressed when customer finds a good solution (12th day). Later he/she could realise that some attributes of the solution are quite insufficient and therefore the progress performs a decline to neutral and deeper to (-1) (14th day). The progress of TCX till the end of customer's journey (34th day), continuous as follows in Table 2 and is presented in figure 3.

Table 2. *Experimental results*

Days	Emotions
1	-4
2	-4
4	-3
6	-4
10	-1
12	1
14	-1
15	0
20	1
25	2
26	-1
28	1
30	2
31	1
33	2
34	3

4. CHALLENGES OF MANAGING AND IMPROVING TCX

CX can be analysed as a process from the Management point of view. CX is a process, sometimes a long on-going process. The questions, which we set in order to address, understand and to attach to the challenges of managing and improving TCX follow.

Can a process be managed after it is measured? What are the attributes of a process, which can be managed? In which framework could be defined the performance of CX as a process? Would be a time analysis significant to manage CX as a process?

Introducing the theoretical model of TCX we can see the current results of TCX in a case as an example, see figure 3 and set the TCX as a goal for the company to pursue an improvement of TCX, see figure 4.
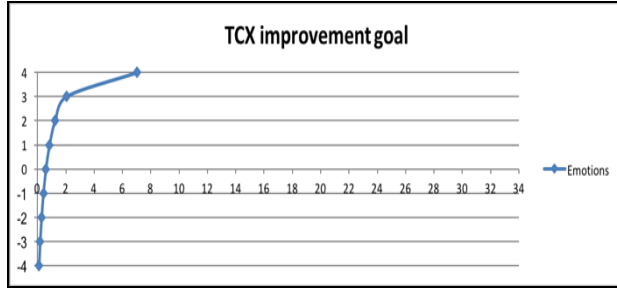
Fig. 4. *TCX improvement goal*

The TCX improvement goal should be close to a logarithmic curve as shown above, because emotions should be positive as soon as possible to satisfy customer. Waiting time for customer is unpleasant, ineffective, costly and therefore waste. Emotions and feelings during a waiting mode are usually negative.

Theoretically boosting emotions faster, in less amount of time by using more resources in order to satisfy customer faster, should look like the theoretical improvement goal as presented below, figure 5. For example, a customer needs a new mobile phone and he is aware of it by feeling the absence of new features, technologically advances, new design etc. So he/she starts from the negative scale of (-3) or even (-4). If he/she wants a good solution in a short period of time he/she will use technologies and resources, such as searching in internet, so he/she needs an internet connection, a system to have access to the internet, companies should have websites, where they present the products, assets of a company have to update their data bank in company's website, customer searches, finds and compares different solutions to each other, etc. Finally, he/she decides, purchases the solution and it is delivered and usable. After all those actions during customer's journey, customer reaches the emotion scale of (3) or (4), which is the target in customer's journey. All those actions from (-3) or (-4) to (3) or (4) need time. In order to boost those actions to accomplish them in less time in order to satisfy the customer faster in less time more resources, technological advances etc. are required. Such an action is feasible but it could be very unaffordable for a company and customer, too. Therefore such a performance could be very rare.
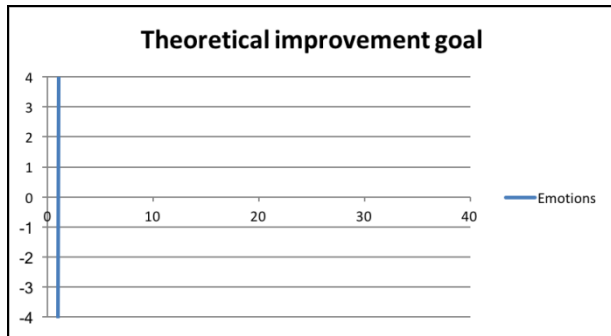

Fig. 5. *Theoretical improvement goal*

Emotions and feelings should be improved fast and with the right treatment to achieve satisfaction. Improving emotions from a negative to a neutral, (0) scale, and to a positive status, (1) to (2) scale, can be and should be achieved in a short period of time. But

reaching higher status of positive emotions and feelings, (3) to (4) scale, could be not so easy as lower status, (-3) to (0) scale. A company probably needs more time, resources, assets and effort to improve from to (2) to (3) and (4). Reaching lower status of the positive emotions and feelings fast and economically is an advantage in a competitive market and a win for customer, too. Every customer wants to be 100% satisfied but many times an 80% is acceptable, too. A trade-off reaching 100% customer's satisfaction fast and performing low company's cost can be an acceptable improvement goal for TCX. The challenges in TCX model for management could be summarized as follows.

4.1. Minimize customer's journey time

Every customer wants to fulfil his/her needs fast. Therefore, the time between emotional changes or stable status with no emotional change and the total customer's journey time should be minimized, see figure 6, and Eq. (1).

As an example, time from (-4) to (-4) is 1 day, according to Table 2, time from (-4) to (-3) is 2 days, time from (-3) to (-4) is 2 days, etc. Total customer's journey lasts 33 days.
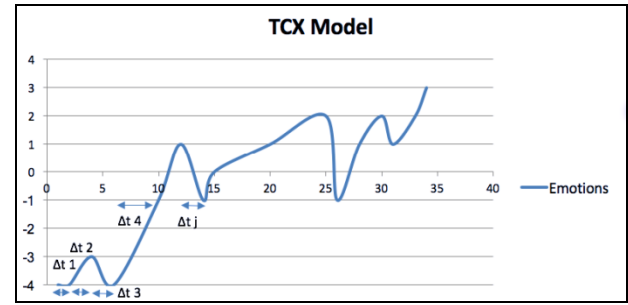

Fig. 6. *Time in TCX model*

$$\min = \left\{ \sum_{1}^{j} \mathrm{D}t_j \right\} \quad (1)$$

4.2. Minimize total emotional decreases in customer's journey

During customer's journey, emotional decreases can be performed. Therefore, minimizing emotional decreases is a challenge for management, see figure 7, and Eq. (2).
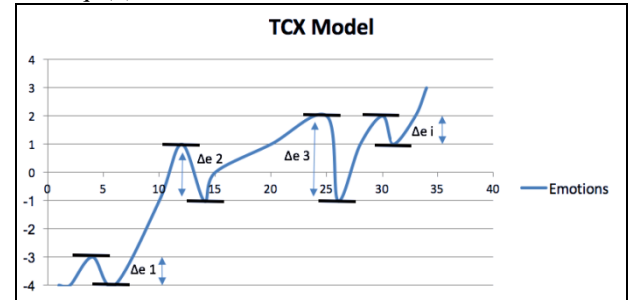

Fig. 7. *Emotional decreases in TCX model*

$$\min = \left\{ \sum_{1}^{i} \mathrm{D}e_i \right\} \quad (2)$$

4.3. Minimize company's effort to improve TCX

The improvement effort is the area between graph of Emotions from the example, figure 3, and improvement goal graph for this example, figure 4, as shown below figure 8.
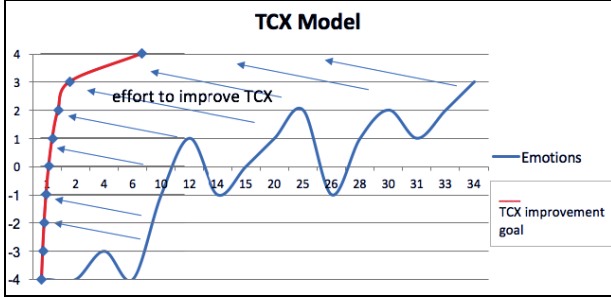

Fig. 8. *Effort for improvement in TCX model*

The area between graphs is measured as follows:

$$Effort = \int_{min\,scale}^{max\,scale} \left[\begin{array}{l} \text{Emotions graph (scale) -} \\ \text{Improvement goal graph (scale)} \end{array} \right] d(scale) \quad (3)$$

Emotions graph (scale) > Improvement goal graph (scale),

where:

- min *scale* is the minimum scale that customer has expressed for his emotions in TCX model,
- max *scale* is the maximum scale that customer has expressed for his emotions in TCX model,
- Emotions graph scale is the function (scale), which expresses TCX given by the customer,
- Improvement goal graph scale is the function (scale), which expresses the TCX improvement goal.

For calculation reasons, the logarithmic trend lines of graphs could be used, as shown below figure 9.
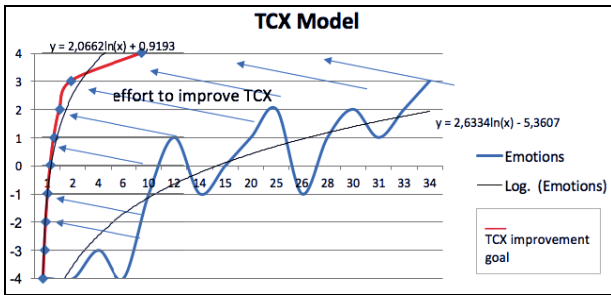

Fig. 9. *Logarithmic trend lines*

The equations of Emotions graph and Improvement goal graph are respectively:

$$y = 2{,}6334 ln\left(x\right) - 5{,}3607 \quad (4)$$

$$y = 2{,}0662 ln\left(x\right) + 0{,}9193 \quad (5)$$

We solve to x in order to integrate to Emotions scale, yy' axis. So, we have respectively:

$$x = e^{\frac{y+5{,}3607}{2{,}6334}} \quad (6)$$

$$x = e^{\frac{y-0{,}9193}{2{,}0662}} \quad (7)$$

By using Eq. 3 and min scale is (-4), max scale is (3) and not (4) because max emotion scale in the example is scale (3), Emotions graph is expressed by Eq. (6) and Improvement goal graph is expressed by Eq. (7) we get the following equation (8).

$$Effort = \int_{-4}^{3} \left[e^{\frac{y+5{,}3607}{2{,}6334}} - e^{\frac{y-0{,}9193}{2{,}0662}} \right] d(y) \quad (8)$$

By solving the Eq. (8) we get the result of Effort = 45,2798 displacements of emotions (yy' scale) with respect to time (xx' scale). Displacements of emotions are practically the emotional change of customer from one emotion scale to another one.

Many companies make efforts to improve CX. How a company can improve physically TCX? Some of them share results and make proposals on how to improve CX on the web.

An example follows [39]:

- Build goodwill with customers.
- Fast-track cost reductions, such as wasted time, resources, and energy.
- Build employee morale.
- Reap ROI from investments in Voice of Customer (VoC), CRM, customer care, etc.
- Systematic CX improvement by affecting the entire organism.
- Build and operate Cross-functional teams
- Engage everyone in Voice of Customer (VoC) actions in order to gain everyone's action on key drivers.
- Resolve & prevent customer pain systematically by using root cause analysis, formal complaint management, quality tools, organizational learning, and systematic prevention and communication.
- Enable customer-focused daily work by using CX internal excellence criteria in their decision-making.

5. CONCLUSION AND FUTURE RESEARCH

Directions for TCX challenges are analysed and addressed in order to reveal the feasibility of conceptualizing, measuring and managing CX. This paper introduces TCX for customer's journey assessment. The goal is to conceptualise measure and manage (improve) customer's journey and its attributes (Initialization, Touchpoints, In-between Touchpoints and Finalization) as discussed above.

A new model for TCX is presented. A new way to measure TCX model is addressed clearly by an example. When something is measured, it could be managed, too. Therefore, a new way to manage (improve) the current

TCX performance in a company is presented and addressed. The proposed TCX model can be used by practitioners in real cases.

The future research will include applications of TCX model in real cases in the market. The technological challenge to develop techniques and tools to capture emotions not only during Touchpoints but during the whole customer's journey can be addressed. Statistical models and methods to analyse those data, referring to capturing emotions, can be tested and improved. Are surveys good enough to capture and analyse emotions? On-line tools and digitalization technologies, such as on-line configurators, are used to capture data from customers during touchpoints. Are they sufficient to capture and analyse emotions during the whole customer's journey and how? Can science of biology contribute to this action of capturing and analyzing emotions during customer's journey?

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