

A 4-stage Mental Model of Conversion: An Approach to Capture Transition of Customer Mind

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Abstract— Conversion is one of the ultimate goals of service providers. It requires an in-depth understanding of internal mental behavior toward conversion. There are many industrial best practices in terms of guidelines for conversion-oriented web design and smartphone application design. Most of them are still in a phase of trial-and-error because they lack a systematic methodology that deals with the mental flow of a customer during conversion. In order to provide building blocks towards a systematic construction of conversion-oriented web design methodology, the author proposes a 4-stage view model of conversion.

Keywords— Mental model; conversion: view model; conversion-oriented web design; methodology;

I. INTRODUCTION

Conversion as a marketing term is defined as “the point at which a recipient of a marketing message performs a desired action.” It is the result of a call-to-action, such as a purchase, registration, social sharing, reservation, and so on. Conversion is one of the ultimate goals of e-commerce service providers. Without conversion, most web design and smartphone application design would not make sense from a business perspective. It is a critical part of the business process, but the exploration of this in web design is still one of the unexplored fields of business practices and academic investigation. Usually, it is a top-priority issue with a lack of in-depth consideration. We witness the emergence of new technology every day, however, we have to balance between the underlying psychological considerations and considerations concerning the technology of something new. Many investigations of conversion in the industry are superficial and just massage the numbers, such as conversion ratios.

In order to systematically deal with mental transitions of customer’s internal journey, it is important to decompose conversion into trackable parts for e-commerce. There are some legacy decompositions of conversion in the advertising industry. Also, there are some variations of traditional conversion frameworks that deal with social media marketing.

In this paper, the author is inspired by Bartle’s classification schema to provide a novel framework of conversion. Bartle’s classification schema was coined from the Bartle test of gamer psychology, which deals with four dimensions of massively multi-user online games. The author

discusses a 4-stage view model of conversion in order to provide a framework of conversion in modern e-commerce.

II. BACKGROUND

A. Purpose of Research

The aim of this research is to identify a stage model of conversion-oriented web design.

B. Related Work

There are three types of research of conversion in e-commerce: a) conversion as a part of human factors, b) conversion-oriented web design, and c) conversion as a metric of evaluation of a system or a component of marketing.

First, conversion is a part of persuasion and human factors.

There are many human factor studies on conversion. Lin et al. empirically examined the relationship between in-session stickiness and conversion [1]. Zhao et al. presented an improved conversion rate using recommendations based on a purchase-interval model [2]. Sumita et al. discussed the impact of mobile access on information search completion time and the conversion rate [3].

Conversion depends on usability. Low usability leads to low conversion. Kuan et al. discussed the usability and conversion [4].

Conversion is also impacted by rich media factors. Di et al. discussed the impact of visual image on conversion [5]. Credibility is an important factor for web design. Fogg et al. discussed credibility issues in web design from their survey [6] [7].

Second, conversion-oriented web design includes the following research. Jankowski discussed the balance between user experience and persuasion in conversion-oriented web design [8]. He also discussed a fuzzy inference engine of repetition of content for increased conversion [9].

Alhammad et al. discussed persuasive web design using the Persuasive Systems Design model [10].

Halpern discussed the combination of user mental process and conversion in e-commerce [11]. He provided the insight of analyzing mental process in order to improve conversion in web design.

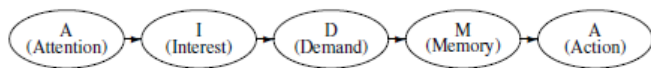


Fig. 1. Consumer behavior hypothesis: AIDMA

Yamakami discussed short-term and long-term conversion models and web design flow diagrams for conversion in e-commerce[12].

Third, conversion is a part of evaluation criteria and marketing.

Conversion is an integral part of the system metrics and components of web marketing. Wang et al. presented an opportunity model of recommender systems and showed that it increased the conversion rate in pull-based systems and user satisfaction/utility in push-based systems [13].

Xie et al. discussed an analytical model of web marketing of commodities using abundance, concern degree and conversion rate [14].

Conversion is not a static process. Understanding of conversion requires extensive experiments with user behavior. Kohavi et al. discussed the rules of thumb for controlled web experiments from thousands of experiments of web sites [15].

The originality of this paper lies in identification of the mental stages during conversion and the discussion of these stages in web design.

III.METHOD

This paper provides with stage-by-stage modeling of conversion in order to facilitate a systematic methodology to improve the conversion performance of web design. The author applies the following steps:

- Observe the pitfalls and best practices of conversion-oriented web design.
- Identify a model that fits the understanding of stage-based mental transition of a user, and
- Identify measurement methods that facilitate the identified model.

IV.OBSERVATION

Roland Hall presented a consumer behavior hypothesis "AIDMA" as depicted in Fig. 1.

This behavior hypothesis is popular in the advertising industry in Japan. It was coined a century ago, when the retail industry started to be driven by mass media. Modern customers are equipped with cutting-edge information using abundant cloud-based knowledge. This hypothesis was revolutionary a century ago because it took a consumer-oriented perspective. Over the span of time, there is a power shift between sellers and consumers. The differences are depicted in Table I.

A variation of AIDMA, AISAS, was proposed by Dentsu, a Japanese advertising agency, in 2005. AISAS represents Attention, Interest, Search, Action, and Sharing, which addresses Internet marketing.

TABLE I

DIFFERENCES OF SELLER AND CONSUMER POSITIONS

Century	20th	21st
Information	Scarce	Abundant
Focus	Information	Action
Power balance	Sellers have a superior position	Equal
Decision power	Sellers	Consumers

TABLE II

ISSUES IN MODERN INTERNET MARKETING

Aspect	Direction
Focus	It requires more focus on the action phase.
Refinement	User mental status requires further micro-decomposition.

In modern marketing, the consumer is empowered by the vast power of information supported by the Internet and cloud technologies. The efficiency of information-guided persuasion continues to decrease these days. In order to cope with modern Internet marketing issues, it is important to make use of a shifting of focus, as depicted in Table II.

In order to identify a framework to deal with these issues, the author makes an analogy of the Bartle Classification Schema for constructing the corresponding counterparts in the domain of service design.

First, the author describes the original Bartle Classification Schema with its two dimensions. The Bartle Classification Schema was derived from the Bartle test of gamer psychology, which identifies the characteristics of massively-multi-user online gamers. The Bartle Classification Schema is depicted in Fig. 2.

Second, the author proposes a classification of e-commerce users through an analogy to the Bartle Classification Schema. The classification is depicted in Fig. 3.

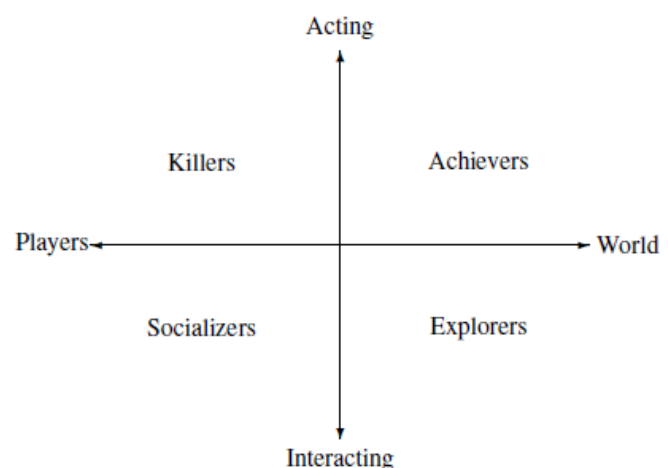


Fig. 2. Bartle Classification Schema

TABLE III

RATIONALES FOR THE ORDER OF CONVERSION STAGES

Stage	Rationale
Benefits	Benefits are more eye-catching than other factors ("on the same page" feeling, trust, removing obstacles). This fits the early phase of conversion leading users to the latter phase of conversion. People are quick to respond to something that is advantageous to them. This is a bridge between attention and conversion.
"On the same page" feeling	It is related to resonance to one's own emotional state, such as pain. Customers seek deep understanding of their own contexts. This is a customization phase that leads to higher conversion rates in the later stages. Customization and resonance to their own needs and emotion prepare the way leading to conversion. Some users do not fit the proposed solution will drop out. This is a filtering stage to ensure high conversion rates.
Trust	People need to have confidence, and especially trust, in inter-personal relationships. Even though business conditions are good, it is useless if one is cheated. People unconsciously check trustworthiness when they buy from people other than close friends.
Removing Obstacles	This is the final phase. There are some burdens such as troublesome required operations (operations that are not easy) for conversion and semantic risks such as bogus products or trouble with delivery. Final conversion depends on minimizing the perceived risks with an easy user interface and semantic protection such as a product guarantee.

TABLE IV

4 FACTORS OF SERVICE DESIGN

Factor	Description
Benefit	Utility to users provided by the service.
Risk	Risks on the user side during the use of the services. Risks include obstacles such as difficulty of use, etc.
Me-ism	Users have a universal tendency toward me-ism. They prefer satisfaction of a wide range of selfish interests.
Social experience	Relationship, trust, and being part of a group or a community are important factors for satisfaction.

TABLE V

COMMON PITFALLS FOR WEB DESIGN FROM THE PERSPECTIVE OF CONVERSION

Item	Description
Distraction	Too many distractions like too many navigation links and advertising links instead of a simple conversion link-only web page. Too many products to buy. Too many choices such as color variations, etc.
Inconsistency	Inconsistent colors, icons, leading text and fonts.
Lack of trust	Lack of social verification, vague vendor identity.
Too many steps	Too many input and navigation steps for the completion of conversion.

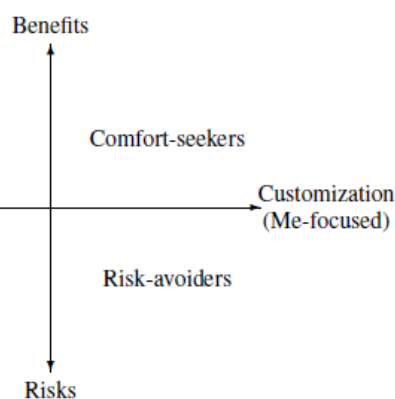


Fig. 3. Mental Micro-status Classification

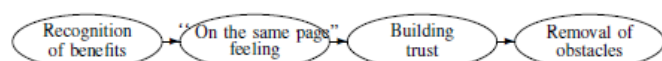


Fig. 4. 4-stage view model of conversion

Each person has a different portfolio derived from the different regions. Considering the chronological order of each factor, the author proposes a 4-stage model of mental conversion as depicted in Fig. 4. First, people notice gains, such as bargains, limited-time offer, special offers, and gifts. Second, people acknowledge the "on the same page" feeling. They respond to emotional resonance, such as understanding the burning pain of their problems. They want to be understood in-depth. A common example is "I suffered the same sufferings in the past. I can understand your feelings and pain." Resonance to the emotional state, such as pain and sufferings, is a common technique in personal persuasion. Third, personal confidence and trust are tested so that customers can eliminate possible troubles in non-face-to-face commerce transactions. At this stage, a user forms the intention to respond to a call-to-action. Finally, the removal of obstacles, such as trouble with products or delivery, or the difficulties thereof are important. This stage minimizes the friction against performing an action responding a call-to-action.

The order of steps follows the rationales depicted in Table III

The author identifies 4 factors of service design as depicted in Table IV.

Common pitfalls of web design from the perspective of conversion are depicted in Table V.

Improvement of conversion depends on how service providers identify their weaknesses that derive from these pitfalls and eliminate negative factors in their web design.

The best practices of conversion-oriented web design are depicted in Table VI.

The proposed model leads to the following micro-step checks of conversion-oriented web design as depicted in Table VII.

TABLE VI

BEST PRACTICES FOR CONVERSION-ORIENTED WEB DESIGN

Item	Description
Clarity	Each web page has clarity in text, structure, and visual representations. The purpose of the page is crystal-clear.
Simplicity	Each web page provides easy conversion without mental or physical workloads for end users.
Consistency	Writing styles, conversion mechanisms, and navigation conventions are consistent across web pages
Less distraction	Messages are clear and each page has no distracting information or links.
Trust	Web site demonstrates trust, such as reliable transaction records and social reputation.
Esthetics	Web pages have esthetic value that attracts and pleases end users.

TABLE VII

MICRO-STEP CHECKS DERIVED FROM THE PROPOSED 4-STAGE MODEL

Micro-stage	Check
Benefit	Without benefits, a user will not pay attention. This is the attention-catching stage, and the effect of attention accumulates with the rate of web visits.
Personal fits	Resonance with the self-problem leads to the loss of out-of-target visitors and a high conversion rate among remaining users. These two factors can be measured step-by-step in terms of remaining users. The rate can be compared in an intra-product manner.
Trust	Trust can be measured by the rate of remaining users from the trust-generating stage. In many cases, it is the social verification part of web design, where social verification is the most designated source of trust.
Risk	The risks consist of complexity and semantic risks. Complexity-based risks can be measured by measuring the effect of simplicity. Semantic risks part can be measured by the rate of remaining users from the corresponding part, such as a product guarantee or a cash-back clause in the case of dissatisfaction.

This table describes a quantitative comparison of data traffic. Each factor can be measured by collecting user feedback in a) surveys, or b) interviews. Information gathering can be done during a trial phase or a commercial phase.

V. DISCUSSION

A. Advantages of the Proposed Method

The comparison between the proposed method and previous approaches are depicted in Table VIII.

The proposed model provides a conversion-focused model with an awareness of phases. This awareness provides a step-by-step framework that deals with maximum conversion utility in web design.

The proposed model provides a general framework for persuasive technology that facilitates conversion using benefits and risks. This is a general phased model of persuasion with three elements, benefits, risks and personal customization. These three elements can be found in many business fields outside of e-commerce. It can be applied to a wide range of persuasive technology applications such as gamification applications, and education applications.

TABLE VIII

COMPARISON BETWEEN PROPOSED METHOD AND PREVIOUS APPROACHES

Approach	Benefits	Limitations
Proposed method	Focuses on the conversion process with a clear phase model that deals with benefits and risks.	Excludes general attention phases prior to conversion.
AIDMA approach	Conventional process model that fits the old customer communication process.	Lack of clear focus on conversion.
AISAS approach	A variation of AIDMA that highlights social sharing.	Lack of clear focus on conversion.
Best practices of conversion-oriented web design	Focuses on guidelines for conversion.	Lack of process model that guides the better building of web pages.

The proposed approach provides a phase-by-phase approach that leads to the chronological order of the micro-mental statuses of customers. This constructs a funnel approach that produces a tool for identifying inter-funnel problems in web design. This leads to easy identification of web design issues from the perspective of micro-stage conversion.

The phases identified in the proposed model provide step-by-step quantitative verification of the conversion performance of web design in each phase. This helps identify the weaknesses in the web design during field tests from phase-by-phase verification. Also, this helps identify the effectiveness of per-phase improvement during the iteration of design updates.

B. Limitations

This paper is descriptive and qualitative. It deals with just concepts. Verification and quantitative analysis of the proposed model remain for future study. It lacks an in-depth quantitative analysis of quantitative experiments or real-world examples.

The proposed model can be applied to a wide range of applications outside of web design, such as business persuasion, education, and gamification applications. However, the boundary between what it applies to and what it does not to apply to is not investigated in this paper.

VI. CONCLUSION

Conversion as a marketing term means turning a potential customer into a customer that responds to a call-to-action. It is critically important in the web design of e-commerce sites. No one denies the importance of conversion, however, the time and money being invested in order to understand this part of user behavior is limited. However, much academic and industrial interest is just focused on superficial numerical results. In order to deal with conversion, we need to explore for an in-depth understanding of user behavior from the psychological viewpoint. We need to decompose conversion in order to deal with it with the appropriate technology components, using correct design.

The proposed method provides a useful framework for web design that focuses on 4 micro-phases of conversion for web

services. This phase-by-phase approach provides a framework that deals with phase-by-phase examination of effectiveness of web design from the perspective of conversion. This also facilitates judging of the conversion performance of each design update during the trials for updating a web design with stage-by-stage evaluation.

The stage-by-stage decomposition provides a framework that can be used for building quantitatively-managed ecommerce applications in order to provide a competitive edge in e-commerce.

This staging of mental transitions is also applicable to smartphone application design as well as web design.

The proposed framework can be applied to a wide range of emerging services deployed in the IoT-empowered smart city services in order to persuade non-IT users to integrated visible and invisible services on a city-wide information infrastructure platform such as CPaaS.io [16].

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