



# Personality traits and effectiveness of presentation of product information in e-business systems

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Consumer interaction with product information is one of the critical components in business-to-consumer (B2C) e-commerce environments. Online consumers' characteristics can be expected to play an important role when designing how product information is presented in such e-commerce environments. We suggest that online consumers' personality traits impact effectiveness of the presentation of product information on e-commerce sites and the extent to which the various e-commerce environments are effective. In this article, we propose and empirically validate relationships among online consumers' personality traits, product information presentation richness and on-line consumer behaviour in e-commerce environments. Results show that effectiveness of product information presentation varies by online consumers' psychological types, and that rich product information presentation significantly influences the online buying behaviour of intuitive types, and feeling types, rather than sensing and thinking types. Discussion of the results and their implications for theory and practice as well as limitations and future research directions are presented.

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## Introduction

Over recent years, the number of people using e-commerce environments instead of, or in addition to physical environments for their shopping needs has been growing exponentially. In general, these shoppers differ from one another, not only on traditional demographics such as age, gender, education and computer/information literacy but on a number of personality traits such as self-efficacy, risk-taking propensity, dogmatism, tolerance for ambiguity, locus of control, degree of motivation, problem-solving/decision-making style, etc (Taylor & Dunnette, 1974; Phares, 1976; Gingras, 1977; Zmud, 1979; Henderson & Nutt, 1980; Benbasat & Dexter, 1982; Nutt, 1986; Trauth & Cole, 1992). While it is fairly easy to classify customers into specific traditional categories such as socioeconomic classes, education groups, ethnic groups, or age groups, it is difficult to predict and explain their online behaviour using these classifications only in light of the many other above-noted differences. In order to be successful e-commerce environments should be able to satisfactorily service the diverse information and other needs of the customers to support product choice and actual online purchase trans-

action. There is a need to better understand customer behaviours in cyberspace specifically in relation to their individual characteristics in order to better design the e-commerce environments.

Over the past 2–3 decades, a number of user characteristics such as age, gender, education, domain expertise, cosmopolitanism, systems experience, skill-base, cognitive style, etc have been identified as important variables in the design and implementation of individual information systems (Lucas, 1978; Kwon & Zmud, 1987). There have been numerous studies on individual differences positing that these factors can potentially influence IS success (Zmud, 1979; Alavi & Joachimsthaler, 1992). However, cognitive style research, as an area has been subject to criticism for inconclusive study findings and the small amount of variance explained (Huber, 1983; Alavi & Joachimsthaler, 1992). Recently 'personalisation' as an area of research is gaining attention in IS and e-commerce field (Palma-dos-Reis & Zahedi, 1999; Mobasher *et al*, 2000; Riecken, 2000). Personalisation (in terms of both the information content and context) needs to take into account many of the above-noted individual-specific characteristics. One of these characteristics is personality. Personality variables have been frequently and widely examined in decision-making, information systems, marketing, and organisational literatures (Benbasat & Dexter, 1982; Hunt *et al*, 1989; Nutt, 1993; LaBarbera *et al*, 1998; Plummer,

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2000; Lu *et al*, 2001). It has been argued, and found that the personality variables are significantly related with characteristics of decision aids (eg, DSS, advertising, etc) and impact decision makers' behaviour (Benbasat & Dexter, 1982; LaBarbera *et al*, 1998; Plummer, 2000; Lu *et al*, 2001). Also, research dealing with consumers' personality is becoming increasingly important in e-commerce environments due to advancements in the Internet technology that makes it possible for e-commerce systems to be customised for (almost) every single customer. There are many different formats and media for presenting e-commerce environments to on-line consumers. We will argue a little later that different on-line consumers have different preferences on various aspects of e-commerce environments.

One of the important aspects of an e-business system is to effectively present and communicate product/service information to (current and prospective) online consumers (Hoffman & Novak, 1996; Palmer & Griffith, 1998). Consumers, as we will discuss later in detail, differ significantly in their preference for various types and format of product information and in their ability to process them for decision-making. Various media and formats choices that range from simple text, static pictures, 3D-enabled picture, virtual experience-enabled picture, to VR (virtual reality) are available for presenting product information. These presentation media differ in terms of richness. Few, if any, studies exist that have examined the effects of these new information presentation media on online consumer decision-making in light of differences in their information processing needs and capabilities. The purpose of this paper is to investigate the relationship between product information presentation richness and personality in relation to online consumer behaviour. We argue that various product information presentation styles have different impacts on different types of online consumers. We theorise those relationships and empirically validate them in this study.

The article is structured as follows: in section 2, we draw from related theoretical bases (in IS and marketing/advertising literatures) to develop the central propositions of this study. Section 3 discusses the research design and administration of the experimental sessions, and presents the results of the study. This is followed by discussion of the results, their implications for research and practice, as well as limitations and future research directions in section 4.

## Theoretical foundations and proposition development

### *Richness of product information presentation*

As noted earlier, product information in e-commerce environments can be presented using various media and formats. Traditional studies on information representation formats were limited in terms of the number of formats they had available to them. However, recently

maps and multimedia have been studied as information representation formats (Lim & Benbasat, 2000; Mennecke *et al*, 2000). Most previous studies have focused primarily on table *vs* graph as major presentation formats, and investigated the effect of these formats on decision-makers in various task contexts, coming up at times with seemingly inconsistent research findings (Remus, 1984; DeSanctis & Jarvenpaa, 1985; Dickson *et al*, 1986; Remus, 1987; Jarvenpaa & Dickson, 1988). However, these two formats are not the only (or even the most important) formats available for presenting information in e-commerce environments. As information technology has advanced, there are a number of formats and media for representing product information in e-commerce environments. For example, they can range from textual information in table format, textual information with graph, textual information with static picture, textual information with dynamic (3D) picture, etc. In terms of media for presenting product information, there are numerous media including text, static picture, 3D-enabled picture, virtual experience-enabled picture, moving picture with sound, walk-through-enabled picture, virtual reality using gears, etc. These media are substantively different in terms of richness. Richness has been defined as the potential information-carrying capacity of data (Daft & Lengel, 1984).

The 'Media Richness Theory' of Daft and Lengel (1984) asserts that media richness emerges from four major factors: (a) the number of cues and channels utilized; (b) immediacy of feedback; (c) language variety; and (d) personal focus. Media such as face-to-face meetings and the telephone have been noted to be high in richness, whereas media such as mail services and fax have been argued to be relatively low in richness. Richer media have the ability to provide greater language variety, multiplicity of cues, greater personalisation of communicated message, and more rapid feedback (Dennis & Valacich, 1999).

Most previous studies based on media richness have dealt with information communication media, and not really with information presentation media (Daft & Lengel, 1986; Daft *et al*, 1987; El-Shinnawy & Markus, 1992; Dennis & Kinney, 1998). The factors affecting richness of information presentation media can, however, be different from those influencing communication media. For example, immediacy of feedback may not be very appropriate in the case of information presentation media. In the context of B2C e-Commerce environments (specifically, product information presentation) only some of the above characteristics are relevant (eg multiplicity of cues and language variety) and others can be adapted to describe richness of product information presentation. The presentation media (text, static picture, graphics, video, 3D, and animations) available for representing product information characterise varying degree of richness. Richer product information presentation media employ a wide variety of informational cues

(eg visual cues and experiential cues) and symbolic languages (eg graphics, pictures), and greater interactivity and personalisation to better convey information, especially nonverbal messages (Daft & Lengel, 1986; Lim & Benbasat, 2000). It has been suggested that text is a lean information presentation medium, whereas multimedia is regarded as a rich information presentation medium (Lim & Benbasat, 2000).

As argued earlier, the characteristics of online customers interacting with the web to access and process (product/service) information and make their purchase choices vary widely. Not everyone requires the same type of information. In this study, we propose that the richness of information presentation medium is closely associated with on-line consumers' psychological types, meaning that they have different preferences for richness of product information presentation. This is discussed next.

### **Cognitive style and Jung's theory of psychological types**

Cognitive style, broadly, refers to the distinctive ways in which people perceive and approach the world. Simon (1960) defines cognitive style as, 'the characteristic, self-consistent mode of functioning that individuals show in their perceptions and intellectual activities' (p. 72). People are inherently different in terms of how they acquire and process information while engaged in decision-making or problem solving. These differences, rather than being individually unique or random, can be categorised into certain patterns or types, which can be explained by differences in psychological functions people have (Myers, 1962). Psychological types (that focus on cognitive style) provide a fairly rigorous theoretical approach to detect these differences. The theory of psychological types (Jung, 1923; 1971) describes individual differences in terms of their preferences for acquiring and processing information.

Originally, Jung's theory postulated two attitudinal dimensions and four basic psychological functions. The two attitudinal orientations comprise and describe the direction of flow of psychic energy or attention: *extroversion*—attention or energy directed to manifest the external world of people or things; and *introversion*—attention/energy focused on the individual's internal inter-psyche processes of ideas and feelings (Berthon, Pitt & Morris, 1995/1996). The four basic psychological functions comprise of two perceptual dimensions that mediate the information to the psyche, and two judgmental functions which process and evaluate that information (often for decision-making). The perceptual dimensions comprise of *sensation*—the function that mediates information through the five senses; and *intuition*—which goes beyond the apparent 'manifest' world to the implicit one of potential and possibilities, and attempts to see wholes, patterns, or systemic gestalts (Berthon *et al*, 1995/1996: p. 80). The judgmental or evaluative

functions comprise; *thinking*—serving to structure and evaluate perceptions in terms of logical inferences, being more objective and impersonal focusing on cause and effect; and *feeling*—processing perceptions by assigning value that can be based on 'personal' values, and be subjective (Berthon *et al*, 1995/1996: p. 80). Finally, implicit in Jung's typology are two functional orientations, later made explicit by Myers (1962) namely, *perceptual* and *judgmental*. Thus, these four major (psychological-type) dimensions, *extroversion-introversion*, *sensation-intuition*, *thinking-feeling*, and *judgmental-perceptual* seek to summarise personality traits.

However, the means by which information is obtained and how it is used to make decisions focuses on issues of utmost and fundamental importance to behavioural scientists (McIntyre & Capen, 1993). Increasingly, current personality researchers seem to acknowledge Jung's theory and the Myers-Brigg Type indicators (MBTI) as a cognitive style approach. Two of these four personality dimensions, *sensation-intuition (S-N)*, and *thinking-feeling (T-F)*, have been widely used in decision-making research. Individuals' preference for certain types of data/information and the approach they adopt to process the data/information have been considered to be key indicators of how people employ data/information to make decisions (Nutt, 1993). Sensation-Intuition dimension concerns people's information *acquisition* style whereas Thinking-Feeling dimension relates to people's information *processing* style. It may also be noted that there is a competing paradigm to Jungian psychological types that has also been widely used in IS and DSS research to identify cognitive style and thus classify people. Although cognitive style is a multi-dimensional construct, most previous IS/DSS research using this competing paradigm focuses on *analytic-heuristic* dimension, which reflects an individual's preference for either utilising abstract models and systematic processes or relying upon experience, common sense and pragmatic approaches (Huysman, 1970; Vasarhelyi, 1977; Alavi & Joachimsthaler, 1992: p. 98). A number of different operationalisations have emerged in using this paradigm, and individuals have been classified as *high vs low analytics* using the *Embedded Figures Test (EFT)* of Witkin *et al* (1971), *Type I*, or trial and error *vs Type II*, or quantitative (Barkin, 1977), or as *analytic vs heuristic reasoning* types (Vasarhelyi, 1977). A recent meta-analytic study (Alavi & Joachimsthaler, 1992) of past DSS research shows that the effect of cognitive style on user attitude and performance using (MBTI) *psychological-type* dimensions (of S-N, T-F) indicate more consistency of results (albeit slightly lower effects) compared to the competing paradigm of *analytic-heuristic*. In view of this finding, subsequent discussion of cognitive style/personality traits and its relationship with product information presentation richness in the next subsection will focus on the four psychological types.



*Sensing-type* people focus on hard data or facts, and the actual and realistic things that currently exist. They look for more details, are more practical, focus more on the present, usually are sequential in their intake of information, and may even seek some amount of repetitive information (Keirse & Bates, 1978; Myers, 1987; Gould, 1991; LaBarbera, 1998). On the other hand, *intuitive-types* like qualitative and subjective information and enjoy vivid imagery, speculation, possibility, and inspiration. They look for patterns (in the data/information they obtain), are more imaginative, focus on the future, may be more random than sequential in their intake of information, and may seek variety rather than repetition of information (Keirse & Bates, 1978; Myers, 1987; Gould, 1991; LaBarbera, 1998).

In terms of evaluation of information and its processing, in general, *thinking-types* seek objective, impersonal, and logical basis of choice (Keirse & Bates, 1978; Myers, 1987; Gould, 1991). Their focus is primarily on analysis of the problem/decision-making situation and the ensuing plan. They tend to prefer more precise information and are more critical. On the other hand, *feeling-types* prefer subjective basis and personal values in their decision-making (Keirse & Bates, 1978; Myers, 1987; Gould, 1991). Rather than seeking precision they prefer more persuasive information in their decision-making and are generally more empathetic. It must be noted, however, that feeling judgments are not emotional reactions but mental evaluations.

Typically, a person's mode of information acquisition combined with his/her information-processing (ie evaluation, interpretation, and decision-making) mode constitutes their cognitive style (Mitroff, 1981). Thus, we end up with four combinations; *ST* (labeled as sensory thinkers), *NT* (intuitive-thinkers); *SF* (sensory-feelers); and *NF* (intuitive-feelers) (McIntyre & Capen, 1993). Drawing from previous research (Mitroff, 1981; McIntyre & Capen, 1993) and building upon the characteristics (of S, N, T, and F) noted above, *ST* types are typically concerned with technical details, engage in logical orderly processing of hard data, look for facts oriented with logic, are orderly and precise, and generally tend to display low tolerance for ambiguity. *NT* types tend to synthesise and interpret, look for ideas rather than facts associated with logic, emphasise understanding, are generally objective, impersonal and idealistic, and tackle ill-defined and abstract situations. *SF* types are more subjective in their decision-making, engage in more open communication, and are interested in facts associated with people rather than with logic. Finally, *NF* types tend to be more creative, insightful, futuristic, and interested in ideas oriented with people rather than with logic. In some sense, *ST* and *NF* types are extremes in terms of their information acquisition, interpretation, evaluation, and decision-making. *ST* types have generally also been found to be somewhat more efficient than *NF* types

in information acquisition and processing (Ramamurthy, King & Premkumar, 1992).

The notion of cognitive style has been believed to be an important factor in IS design and effectiveness and has been continuously studied in relation to IS/DSS design and effectiveness despite Huber's (1983) criticism mentioned earlier (Hunt *et al*, 1989; Ruble & Cosier, 1990; Lu, 1995; Lu & Wang, 1997; Lu *et al*, 2001). It has been suggested that sensing and thinking types are more likely to prefer and accept quantitative decision support, whereas intuitive and feeling types tend to pursue a qualitative decision approach (Lu, 1995). Thus, it has been argued that the rational models (eg Multi-Attribute Decision Models) used for DSS are more effective for sensing and thinking types (Rowe & Boulgarides, 1992; Lu & Gustafson, 1994; Lu *et al*, 2001).

Cognitive style has also been studied in relation to consumer behaviour (Hirschman, 1985; Foxall & Goldsmith, 1988; Gould, 1991; LaBarbera *et al*, 1998). It has been argued that psychological types play an important role in determining consumer preference structure and decision-making behaviour (Hirschman, 1985; Gould, 1991). The two important dimensions extensively considered in this regard are: (1) sensing-intuition that relates perception and information processing, and (2) thinking-feeling that relates to how an individual makes choices and decisions (Gould, 1991). This line of discussion has been applied to advertising as well (McBride & Cline, 1989; Yorkston & LaBarbera, 1997). As noted earlier, it has been found that sensing types prefer realistic, concrete, and informative types of images and advertisements, whereas intuitive types value more imaginative, conceptual, and abstract types of advertisements and that visual imagery used in advertising when consistent with consumers' psychological types (sensing *vs* intuitive) leads to higher purchase intention (LaBarbera *et al*, 1998). Despite the popularity and importance of cognitive style, few studies exist that investigate the implication of psychological type theory for designing product information presentation richness supporting on-line consumers' product-choice decision making within e-commerce environments.

These orderly and consistent differences are also manifested in online consumers' (product) information acquisition and processing behaviour for their product-choice decision-making. To better understand these behavioural differences in relation to (richness of) product information presentation, we will elaborate next on the relationship of product information presentation (PIP) richness to on-line consumers' preferences or psychological types.

#### ***Psychological types and product information presentation (PIP)***

The psychology, social-psychology, management, and education literatures have amassed numerous cases that reveal that individuals with different cognitive styles differ significantly in their information seeking, learning,

processing, communicating, and decision-making (McIntyre & Capen, 1993: p. 630). Thus, the differences in people's information acquisition and processing styles can be expected to have implications for the design of product information presentation in e-commerce environments and its effectiveness on their (online) behaviour. Online consumers make product-choice decisions based on information offered in the e-commerce environments they interact with. Their cognitive styles play an important role in the process of receiving and processing information for their product choice decision-making (Gould, 1991). As noted earlier, their preferences for the type and format of information they seek and ways of processing information are different, depending upon their psychological types.

Drawing on the theory of psychological types (Jung, 1923; 1971) and extending it to the context of online consumers decision-making in e-commerce environments, we would argue that different types of online consumers have different preferences for product information presentation in e-commerce environments. These differences may affect the effectiveness of specific product information presentation (richness) and online consumers' product-choice/purchase behaviour. In other words, the same product information presentation formats and richness is likely to affect online consumers differently according to their preferences for information types and information processing approaches (ie psychological types).

We would point out that there is no single (dominant or uniformly) best design of product information representation for a specific product and assert that the best design can be achieved when a 'fit' with online consumers information acquisition and processing styles can be obtained (Mobasher *et al*, 2000; Pednault, 2000; Spiliopoulou, 2000). One of the key tenets of *Human Computer Interaction* (HCI) stream of research is the necessity to be able to provide an interface that responds to different cognitive styles of the users (Trauth & Cole, 1992: p. 42). We would also argue that 'preference-consistent' information types and formats lead to more desirable consumer outcomes such as higher levels of purchase intention or actual purchase behaviour (LaBarbera *et al*, 1998). Thus, the effectiveness of a specific product information presentation design can be different, depending upon online consumers' psychological types. We would, therefore, posit that the effectiveness of e-commerce environments could be improved by providing preference-consistent product information presentation.

Effectiveness in this case is a multifaceted construct that can be defined in various ways depending on study purposes and contexts. Within the context of e-commerce environments, it can be defined from two perspectives: provider (or seller) and consumer. From a provider/seller's perspective, it could be enhanced sales, profits, and market shares. From a consumer's perspective, it could include consumer attitude toward e-com-

merce environments, consumer satisfaction and confidence with product-choice and e-commerce environments, purchase intention, and actual purchase behaviour. In this study, purchase behaviour has been chosen to depict the effectiveness of product information presentation, and purchase intention has also been selected to check the validity of this outcome variable. In general, actual purchase (behaviour) is an ultimate goal for both sellers and buyers. With all other factors given and assumed constant (*ceteris paribus*), we propose that e-commerce environments satisfying consumers' information needs are likely to lead to actual purchase behaviour. In its absence, consumers will hold their purchase actions and look for other information sources (eg other web sites, physical stores, etc) until their information needs can be met. It may be noted that a link is expected to exist between effective presentation, purchase intention, and purchase behaviour. The behaviour theories such as the 'Theory of Reasoned Action'—TRA (Fishbein & Ajzen, 1975) and the 'Theory of Planned Behavior'—TPB (Ajzen, 1985; 1988; 1991) dealing with IT adoption behaviour or purchase behaviour explains how behavioural intentions are formed, and how such intentions lead to actions. Based on those theories, effective product information presentation satisfying online consumers' information acquisition and processing style is expected to lead to favourable attitude toward (buying the target) product, this favourable attitude can be expected to affect purchase intention in a positive direction, and finally this behavioural intention (purchase intention) leads to behavioural action (purchase action) (Fishbein & Ajzen, 1975; Ajzen, 1985; 1991).

**Proposition 1:** The effectiveness of product information presentation design in e-commerce environments varies by personality style of online consumers.

### ***Sensing/intuitive types and product information presentation***

It is desirable/necessary to consider detailed relationships between personality traits and product information presentation design. We will consider sensing/intuitive dimension of personality first. There are distinct differences (in terms of information acquisition) between sensing types and intuitive types. These differences should affect how consumers perceive the product information provided in e-commerce environments.

As briefly noted while discussing the underlying (personality trait) theories, apart from Jungian *psychological types*, multiple approaches to measuring cognitive style have been pursued in previous research. Some of these, as noted, are *analytics-heuristics* (Huysman, 1970; Vasarhelyi, 1977), *high vs low analytics* (Witkin *et al*, 1971), *Type I*, or trial and error vs *Type II*, or quantitative (Barkin, 1977), *systematic-heuristic* (Bariff & Lusk, 1977),

*perceptive-receptive* (McKenney & Keen, 1974), *systematic-intuitive* (McKenney & Keen, 1974), and field-dependent *vs* field-independent (Benbasat & Dexter, 1979). Many of these terms have been used interchangeably and their meanings/measurements are similar. For instance, there is a close similarity between heuristic-systematic (of Bariff & Lusk, 1977), *perceptive-receptive* (of McKenney & Keen, 1974) and Jungian 'intuitive-sensing' types. Likewise, there is a similar closeness between analytic-heuristic (of Vasarhelyi, 1977), *systematic-intuitive* (of McKenney & Keen, 1974), and Jungian 'thinking-feeling' types. Some of the previous research (Mock, Estrin & Vasarhelyi, 1972) have found that systematics (and 'sensing' or 'thinking types' by the above mapping) perform better than heuristics (and 'intuitive' or 'feeling types') when using computer information while other studies (McKenney & Keen, 1974; Nutt, 1986) have not found any major differences. Similar conflicting findings exist in terms of the influence of cognitive style on user-attitude to using computer information systems. These types of conflicting findings have led researchers to acknowledge that there are differences due to cognitive style, but that they are unable to come to a clear convergence on what exactly they are, and how they work.

Drawing on the Jungian theory of psychological types, a person with the sensing perception prefers hard data that deals in specifics (Nutt, 1993). A sensing individual would likely be more interested in seeking hard data or actual facts on products they would like to buy (online). Hard data and actual facts on products would appear to be sufficiently represented in less-rich presentation (eg static picture and text-based product information presentation) although additional visualisation tools (eg graph), while being expensive, can also represent such data and facts in a succinct way. On the other hand, the intuitive type prefers qualitative and subjective information, and enjoys vivid imagery (Myers, 1987; Nutt, 1993). The intuitive type is more likely to enjoy vivid imagery of products they want to buy and find the wide choices of symbolic (nonverbal) product information formats such as graphics more appealing. Enjoyment of vivid imagery of products and representation of symbolic and nonverbal product information can be usually achieved fairly effectively by use of rich presentation formats (eg graphics, video, 3D, and animations).

Based on the arguments provided here, for sensing types additional richness of presentation (eg through visualisation tools) may be valued due to more succinct representation of hard data and actual facts, but less-rich presentation (like organised data/facts in a table format) would be sufficient for their information needs, too. However, for intuitive types, a rich presentation could be critical for their information acquisition style and greatly valued, but a lean presentation may not provide much value for them. Therefore, a lean presentation is likely to be less appreciated by intuitive-types than by sensing-types, and a change from lean to

rich presentations is likely to be appreciated more highly by intuitive-types than by sensing-types.

One might be tempted to think that the intuitive types can easily imagine the product from textual product description even in absence of rich representation format. But at the information acquisition stage, lean formats could limit their perceiving function and rich formats would better match their informational type preference and better support/enable their imaginative capabilities and their perception through the intuition. Thus, use of richer presentation of product information in e-commerce environments is expected to be more effective to intuitive than sensing-types.

**Proposition 2:** Effectiveness of richer presentations of product information in e-commerce environments will be more evident to intuitive-type than sensing-type of people.

### *Thinking/feeling types and product information presentation*

Just as there are two ways of perceiving (or acquiring) information, there are two ways of making judgment about one's perceptions (or evaluating and processing acquired information), that is, by thinking or by feeling. This distinctive difference has implications on how online consumers process product information acquired in e-commerce environments in order to make their final product-choice decision. From this perspective, different product information representation formats can influence on-line consumers' decision-making behaviour differently.

Again, following Jungian theory of psychological types, as noted earlier, feeling-types prefer subjective and personal values in decision-making; furthermore, they tend to use their 'heart' more than their 'head' and look for, as well as use persuasive information (Gould, 1991; Nutt, 1993). Extending these to the context of e-commerce environment, online consumers belonging to the feeling type can be expected to prefer subjective and personal values, and persuasive information in product-choice decision-making. Lean media such as plain text stay the same to any viewer and thus tend to be impersonal, whereas richer media, as pointed out earlier, provide a wider variety of informational cues (eg visual cues and experiential cues) and nonverbal messages, employ a higher degree of interactivity, and thus better serve specific viewer's information needs. Richer presentation of product information is likely to provide greater opportunity for feeling-types to evaluate the information in terms of 'fit' with their personal values. Richer presentation media can be used to convey nonverbal or symbolic messages (and meanings) beyond logical descriptions, and thereby better serve the information processing style of feeling types.

On the other hand, thinking-types pursue objective, impersonal, and logical basis for their decision-making



(Gould, 1991, Nutt, 1993). These types also look for more precise information and engage in significant analytical processing. Online consumers with the thinking judgment would therefore be expected to employ objective, analytical and logical basis for their product choice decision-making. Hard data and facts on product attributes can provide a stronger base for the logical choice of thinking-type people than for the feeling-types' subjective decision styles. Hard data (or number) and facts on product attributes can be sufficiently expressed in less-rich presentation media (such as text in a table format) for analytical descriptions of products. However, additional modeling tools could be further useful to support objective, analytical and logical information processing.

Thus, for thinking types additional richness of presentation (eg through modelling tools) may be valuable due to the assistance offered for analytical processing, but less-rich presentation (eg text in a table format) would adequately meet their information processing needs. However, for feeling types, a lean presentation is unlikely to be sufficient to serve their information processing style and thus a rich presentation will be greatly appreciated. Therefore, a lean presentation would be less valued by feeling types than by thinking types, and a change from lean to rich presentations is likely to be appreciated more by feeling types than by thinking types.

**Proposition 3:** Effectiveness of richer presentations of product information in e-commerce environments will be more evident to feeling-type than thinking-type of people.

## Study results

### Research method

To validate the three propositions described above, this study employed controlled laboratory experiments. We developed two different versions (ie two different levels of richness) of product information representation for the same product: a digital camera. We selected a product that was sufficiently complex (in terms of its attribute set, extent of difficulty in completely expressing the product attributes/characteristics) and that could benefit from both lean as well as rich representation formats. A digital camera appeared to satisfactorily fulfill these requirements. Less media-rich or *lean* product information representation had textual description of all the attributes and a static picture, whereas *media-richer* product information representation included text and multi-media. In the rich information presentation setting, subjects could make use of three-dimensional views of the digital camera and also try out various features (eg zooming-in/out) of the digital camera. But, both prototypes had the same amount of textual product description; the only difference was that the richer product information presentation prototype had multimedia-enabled picture in the place of a static picture used for less rich presentation.

Subjects for this experiment were recruited from an undergraduate introductory information systems course in the business school of a major Mid-Western university (in the US) and randomly assigned to one of prototypes. To motivate them to participate in the study, participants received waiver for an assignment and were told that a full credit would be given only after ascertaining that they participated completely and seriously in the experiment. Participation was voluntary and the subjects could withdraw at any time during the experiment. The subjects in each prototype were provided a case scenario that described a buying situation, asked them to assume that they were 'in the market' for the (target) product (implying that there is a 'need'), and that adequate money was available to them if they wished to buy the product (the scenario made it clear that purchase of the product was 'not mandatory'). Once they had read the case scenario they interacted with the prototype assigned to them.

The experiments were administered in sessions of 50 minute each. A maximum of 40 subjects participated in each session. The experiments were conducted in a computer lab equipped with 48 Pentium machines running in a LAN environment. All participants were informed about the schedule of the experiment sessions well in advance. Pilot sessions were held with a number of focus groups before conducting the actual sessions of experiment. The participants in the pilot sessions did not have any difficulty in working with the system. However, after conducting the pilot sessions, minor modifications such as changing character size and proper wording were made to the prototypes and the instructions. Prior to participating in the experiments, the subjects responded to a brief questionnaire survey that captured some of their demographic information. Myers-Briggs Type Indicator (MBTI) (Myers, 1962) items were also included in this questionnaire to measure their personality traits (*feeling/thinking, intuition/sensing types*). MBTI measure is a valid and reliable indicator of psychological type (Lake *et al*, 1973; Blaylock & Rees, 1984) and has been used fairly extensively in prior IS/DSS research (Alavi & Joachimsthaler, 1992).

One specific model and brand of digital camera was presented in both lean and rich presentation prototypes. Subjects, randomly assigned to one of the two prototypes, could get information on that product and try out multimedia features in the prototype that provided richer product presentation environment. At the bottom of the prototype screens, ('order' and 'not order') buttons were provided and the subjects were requested to make their choice. After the subjects finished interacting with the prototypes, *effectiveness* of product information representation, as mentioned earlier, was measured by (the simulated) online purchase behaviour (ie order-button clicking behaviour). A validity check for this button-clicking action was performed using correlation analysis with purchase intention scale (see the Appendix); this scale was included in a questionnaire that the subjects

**Table 1** Correlation between purchase intention and purchase behaviour

	<i>Purchase intention</i>	<i>Purchase behaviour</i>
Purchase intention	1.0	
Purchase behaviour	0.642**	1.0

\*\* $P < 0.01$ ; \* $P < 0.05$

completed after they finished interacting with their e-commerce prototypes. As shown in Table 1, the result of this correlation analysis was quite satisfactory. After collecting data from the experiments, logistic regression and cross-tabulation analyses were employed to validate propositions described above.

### Data analysis and results

As indicated in Table 2, 136 subjects participated in the experiment. Sixty six subjects belonged to the lean presentation environment and the remaining 70 to the rich presentation environment (for the sake of simplicity, we use the term 'lean' and 'rich' in the remaining portion of this paper; they are relatively richer or leaner). Out of 136 data points, 61 were sensing-types, 75 intuitive-types, 52 thinking-types, and 84 feeling-types.

Table 2 also indicates the percentage of subjects who clicked the 'order button' in each cell. Considerable differences are observed among the eight cells suggesting significant variability in online behaviour of the subjects belonging to the different personality-trait groups. The highest value observed is 86% for 'NF' types in the 'rich' product information presentation environment, whereas the lowest is 26% for 'NF' types in the 'lean' environment. For the 'ST' types, the percentages are very similar in both environments.

A logistic regression model was developed to examine the significance of interaction effect between product information presentation (PIP) richness and personality type to validate Proposition 1. The results of logistic regression are shown in Table 3 and also the predictive accuracy of the model is revealed in Table 4 (the overall predictive accu-

**Table 2** Sample size and percentage of subjects with purchase actions

<i>PIP richness</i>	<i>Personality type</i>				<i>Total</i>
	<i>ST</i>	<i>SF</i>	<i>NT</i>	<i>NF</i>	
Lean	0.72 (18)	0.60 (15)	0.30 (10)	0.26 (23)	0.47 (66)
Rich	0.70 (10)	0.72 (18)	0.79 (14)	0.86 (28)	0.79 (70)
Total	0.71 (28)	0.67 (33)	0.58 (24)	0.59 (51)	0.63 (136)

Note: percentage (cell size - # of subjects).

**Table 3** Results of logistic regression

<i>Source/Variables</i>	<i>d.f.</i>	<i>Wald Statistic</i>	<i>Sig. level</i>
Main effects			
PIP richness	1	15.519	0.000
Personality-type (PT)	3	1.664	0.645
2-Way interaction effects			
PIP richness *PT	3	8.911	0.031

Approximate pseudo  $R^2$  explained by the model = 25.3%.

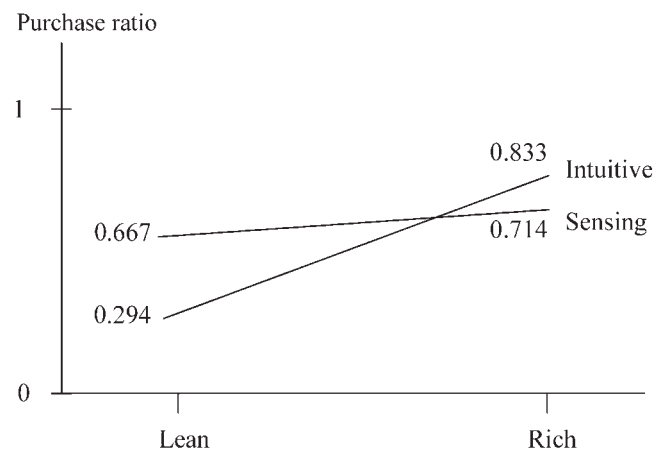
**Table 4** Classification table

<i>Observed</i>	<i>Predicted</i>			<i>Percentage correct</i>
	<i>Choice</i>			
	<i>Not to buy</i>	<i>Buy</i>		
Choice	Not to buy	24	26	48.0
	Buy	9	77	89.5
Overall percentage				74.3

The cut-off value is 0.500

racy at 74.3% is significantly better than 50% of a chance model— $t = 5.64$ ,  $P < 0.001$ ). As shown in Table 3, the interaction effect is found to be significant. It suggests that the effect of PIP richness on online purchase behaviour is different depending upon online consumers' personality type. Thus, proposition 1 is supported.

Next, further analysis was performed to identify the direction of interaction effect proposed earlier in this paper. Figure 1 and 2 show, in a graphical fashion, the online purchase behaviour differences between a 'lean' presentation and a 'rich' presentation for each personality dimension. The direction of interaction effect between product information presentation richness and online consumers' personality emerged as expected. Fig-

**Figure 1** Intuitive vs sensing.



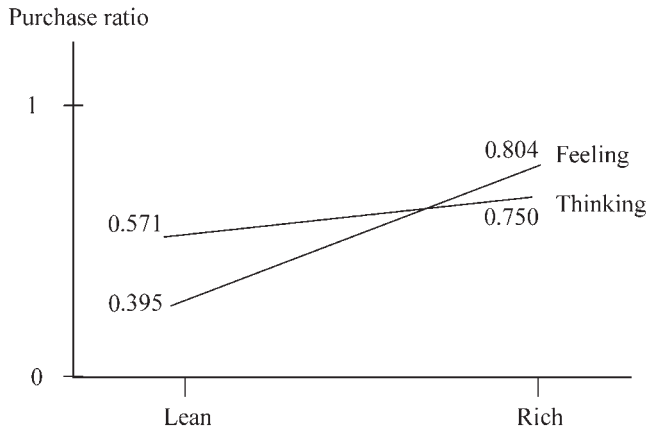


Figure 2 Thinking vs feeling.

Table 5 Test of proposition 2

Personality type	Richness of PIP		Chi-square - $\chi^2$ (Sig.)
	Lean	Rich	
Sensing	0.667 (33)	0.714 (28)	0.160 (0.452)
Intuitive	0.294 (34)	0.833 (42)	22.620 ( $<0.001$ )

Figure 1 indicates a substantially larger purchase ratio difference between lean and rich (product information) presentations for intuitive-types than for sensing-types, where as Figure 2 shows substantially bigger differences between these two product information presentation environments for feeling-types than thinking-types.

The significance of these differences was then tested using crosstab analysis and the results are shown in Table 5 and 6. While, as indicated in Table 5, the difference between lean and rich presentations for sensing-types is not significant, the difference for intuitive-types is significant. Also, as indicated in Table 6, while the difference between lean and rich presentations for thinking-types is not significant, the difference for feeling-types is significant. Table 5 and 6 show that ‘rich’ product information presentations significantly affect intuitive-types and feeling-types. Therefore, both proposition 2 and 3 are supported.

Table 6 Test of proposition 3

Personality type	Richness of PIP		Chi-square - $\chi^2$ (Sig.)
	Lean	Rich	
Thinking	0.571 (28)	0.750 (24)	1.821 (0.145)
Feeling	0.395 (38)	0.804 (46)	14.805 ( $<0.001$ )

## Discussion and conclusion

### Discussion of research findings

This study deals with the notion of product information presentation (PIP) richness in the context of e-commerce environments and proposed relationships between personality and PIP design with respect to effectiveness of e-commerce environments. The results of the study support all three propositions. The effectiveness of product information presentation richness is demonstrated to be contingent on the personality traits of online consumers. The results also show a significant interaction effect between PIP richness and personality, and suggest that the effectiveness of the same product information presentation with a certain degree (high or low) of richness is not the same to all types of on-line consumers, but that it varies depending on their personality types. Thus, the first proposition of this study is supported.

Regarding the direction of interaction effect between PIP richness and personality, it was proposed that the effectiveness of richer presentations of product information would be more evident to intuitive and feeling types than sensing and thinking types. The results indicate that the richer product information presentation has significant impacts on intuitive and feeling types rather than sensing and thinking types. This means that a change from lean to rich presentation significantly impacts intuitive and feeling types’ purchase behaviour, more specifically increasing the likelihood of their product purchase. The same change, however, slightly increases the likelihood of the product purchase for sensing and thinking types, but the difference is not found to be statistically significant. Therefore, propositions 2 and 3 of this study are supported.

A richer presentation can also be used to represent hard data and facts in a succinct way, thus have value for sensing types, and slightly enhance their purchase behaviour. However, this impact was not statistically significant, which means a lean presentation is as good as a rich presentation for them. Thus, as expected, hard data and actual facts on product attributes in less-rich presentation (eg static picture and text-based product information presentation) may be sufficient for their information needs. Also, a richer presentation that includes objective data and analytic aids, may be able to slightly improve purchase behaviour of thinking types, and thus have value for them; but, once again, its influence to them is not found to be statistically significant. This implies that a lean presentation is as effective as a rich presentation for them and hard data and facts on product attributes in less-rich presentation media (eg text in a table format) may be sufficient for analytical descriptions of products and for their information processing needs. In other words, all ‘types’ have preferences on information acquisition and processing according to psychological type theory (Jung, 1923; 1971), and

we proposed that preference-consistent information presentation would lead to favourable behavioural outcomes. Richer (leaner) presentations have a good (poor) fit with intuitive and feeling types' information acquisition and processing style, and thus the effectiveness of richer presentations (from lean presentations) is significantly increased, whereas, for sensing and thinking types lean presentations have a minimum or requisite level of fit (required to sufficiently support their purchasing decision making) with their information acquisition and processing style. Additional product information presentation richness does not (statistically) significantly improve their behavioural outcomes.

Overall, the results of this study show that a richer presentation significantly affects online consumers' purchase behaviour in general in this product type, leading to more purchase actions. The results suggest that while a rich presentation can, in general, lead to higher purchases for online consumers detailed analysis based on online consumers' personality types provides a more accurate story of where the purchase increase due to richness of product information presentation comes from. It shows that the major part of the increase comes mostly from intuitive rather than sensing types, and from feeling rather than thinking types. Alternatively stated, a reduction of PIP richness from 'richer' to 'leaner' presentation format does not significantly impact sensing and thinking types. However, lean presentation formats significantly decrease the purchase behaviour of intuitive and feeling types. It can, therefore, be observed that intuitive and feeling types are much more sensitive to PIP richness than sensing and thinking types.

### ***Implications for research and practice***

This study provides a number of important implications for theory and practice. In prior literature, information presentation richness had been theorised (and tested) to be contingent on task types (eg analysability) involved in using the information. For instance, a recent study (Lim & Benbasat, 2000) reports that text-based, as well as multimedia representations are equally effective in reducing the equivocality levels for analysable tasks, but that only multimedia representation is capable of reducing equivocality for less-analysable tasks. One other recent study (Dennis & Kinney, 1998) finds that matching media richness to task equivocality does not improve decision performance (in terms of quality, time to make the decision or consensus). Another recent study (Grimshaw, Mott & Roberts, 1997) stresses the importance of adding the context (eg use of background information on maps, for example, roads) for users of spatial decision support system where the information presentation is inherently rich. However, in the context of e-commerce systems, the nature of tasks is basically homogeneous in a sense that e-commerce system users

confront preferential choice problems (Todd & Benbasat, 1992), which deal with 'tasks where they choose one from among a set of alternatives, each of which is described by a common set of attributes', although they may differ in terms of complexity and difficulty. Thus, given a specific product choice problem, online consumers' personal characteristics and preferences could become a major factor for designing (suitable levels of) product information presentation richness and strongly influence the effectiveness of product information presentation richness on online consumer behaviour.

Results of this study show that for the product type chosen in this study (a relatively complex product), product information presentation richness (independent variable) is also significant, meaning that a rich presentation on its own significantly influences on-line purchase behaviour. It is possible that one of the reasons for such favourable behaviour may be a positive attitude fostered by the information presentation. This is in line with earlier studies relating cognitive style and attitude (Ramamurthy, King & Premkumar, 1992). However, the results of cross-tabulation analysis show that a rich presentation does not significantly impact all types of online consumers. This implies that in situations/conditions that richer information presentation environment is required for a specific product-choice decision-making (eg a complex product type), personality traits (psychological types) of online consumers are likely to influence their purchase behaviour and must therefore be considered in the design of such EC environments.

One of the important contributions of this study, as implied earlier, is that this study investigated the information presentation richness in relation to decision makers' personality trait and its impact on decision making behaviour in the context of business-to-consumer e-commerce environments and showed interaction effect between information presentation richness and personality traits. Many media richness-related theories (eg media richness theory, social presence theory) have focused (and theorised) on task characteristics in relation to media use behaviour of people, and have not considered people's personality traits. We would argue that this may be one of the reasons those theories have not been able to explain sufficiently media usage behaviour of people (Carlson & Davis, 1998; Dennis & Kinney, 1998).

This line of research also contributes to the marketing literature. A computer-mediated environment as an information source is a very recent phenomenon and quite different from traditional information sources such as print materials (eg consumer magazine, print advertising) in terms of a wide variety of choices for product information presentation. Prior marketing studies have dealt with various types of product information presentations (eg product attribute-based *vs* product brand-based presentation, verbal *vs* pictorial presentation, vivid *vs* pallid presentation, product information order) in traditional buying settings. But

those studies were somewhat limited in terms of their choices of presentation media (or format) and did not fully address the importance of presentation richness (Holbrook & Moore, 1981; Biehal & Chakravarti, 1982; Kisielius & Sternthal, 1986; Cooper-Martin, 1993; Russo, Meloy & Medvec, 1998). Recently, marketing literature has investigated the impact of various aspects (eg interactivity, virtual experience, etc) of product information presentations (on Internet) on online consumer behaviour (Ariely, 1998; Klein, 1999; Ariely, 2000). Considering that little research exists that has investigated the effect of product information presentation richness on online consumer purchase behaviour in relation to their personality traits in the context of B2C e-commerce environments, this study is expected to provoke more related research into product information presentation richness of e-commerce systems in relation to on-line consumers' personality trait, on how best to design product information presentation that can be customised to every single consumer and generate more desirable consumer behavioural outcomes.

The empirical results of this study also offer practical guidelines for B2C e-commerce providers. Since personality traits (psychological types in this study) of online consumers are shown to significantly interact with the richness of information presentation and impact the effectiveness of product information presentation, practitioners need to carefully consider psychological types of online consumers when designing and presenting the product information. Based on results of statistical tests (and Figure 1 and 2), a rich presentation would be the best solution (leading to higher purchasing) for the product type chosen in this study, because such a presentation increases purchases of online consumers in general (ie all personality types) although the increases for the sensing and thinking types are not statistically significant. But, it also needs to be pointed out that providing sophisticated interactive multimedia for product information presentation is likely to be expensive. Thus, detailed cost-benefit analysis would be necessary for a more accurate decision on when it is appropriate to provide such 'rich' interfaces. For instance, if most of the customers are sensing, or thinking types, and the cost of a rich presentation is much higher than possible (moderate) sales loss due to a lean presentation (or possible sales increase due to a rich presentation), a lean presentation could be an appropriate solution. This would be especially true if a majority of target online customers belong to ST type (in light of Table 2 results).

Design considerations would also include how best to identify the personality traits of the consumers without being perceived to be onerous or intrusive, and provide an adaptive interface. Psychological types of web-site visitors can be identified from a direct survey of consumers using MBTI items or other shorter forms of measurement scales, or inferred from the data already known about them (eg data collected at the time of

online registration). Another survey method other than a direct one using standard MBTI items has been suggested that consumers might be polled to choose from a series of prizes that they would like to win in a contest (LaBarbera *et al*, 1998). For example, some prizes might be designed to be more speculative and imaginative such as a 'mystery cruise', while others could be designed to be more concrete and practical such as a monetary reward. Then, online consumers' psychological type could be inferred (intuitive or sensing in this case), depending on their choice of the prize. Even without surveying online consumers directly, the personality type of the audience could be identified (McBride & Cline, 1989; LaBarbera *et al*, 1998). Many years of research have identified well-defined occupations, lifestyles, and media habits that are closely associated with a majority of a particular personality type (Martin, 1995). For example, the computer programming profession attracts a great percentage of sensing types (Myers & McCaulley, 1989; Martin, 1995). This can help to not only identify the online target consumers' general type, but also identify their individual type based on the data (eg demographic data) collected at the time of profile registration. Many web-sites today include the tracking software to collect and analyse data on online consumers' clicking and navigation behaviour (eg where they come from, how they arrived at the site, where they are moving through the site, which media they used, etc) in real time, and this information can be used to infer their type and to provide the interface that best suits them (LaBarbera *et al*, 1998). But, further research into more efficient and effective methods for eliciting online consumers' types is needed in the future.

#### **Limitations and directions for future research**

We should point out that this study only looked at single product. Obviously, no generalisations can be made, based on a single study on just one product. It is necessary to replicate such studies on various products, including products (eg commodity types) where overall richness is not expected to be much relevant to online purchase behaviour. Additionally, the psychological type of online consumers is just one of many individual personality trait differences characterising online customers. Other factors such as propensity to avoid risks, self-efficacy, tolerance for ambiguity, attitude toward new technology, etc may also significantly influence the effectiveness of product information presentation. Also, it may be pointed out that this study has general limitations (eg lack of realism) of laboratory experiments. Regardless of the efforts taken to make the buying context as realistic as possible the study does not constitute a 'real buying' situation by 'real consumers' with a 'real need' for the product under consideration. It also can be noted that a student sample does not represent a general population of online consumers, although we believe that col-

lege students are likely to be better representative (than lay public) of prospective customers for a digital camera chosen in this study. A student population is among the experienced web-users (Hoffman *et al.*, 1996) and differs in important ways (eg age and attitude toward new technology) from the general population (Gallagher *et al.*, 2001). Thus, caution should be exercised when interpreting results in the context of the general population. Future research needs to consider field studies (eg field experiments) to examine effective product information presentations using regular consumers with specific needs.

This study looked at two different presentation formats. Future research needs to consider the effect of various types of new presentation media (eg virtual simulation) in e-business systems. As we had alluded to earlier, personalisation calls for customisation of both the 'context' and 'content'. To avoid confounding of results, we presented the 'same informational content' to all subjects regardless of their personality-traits. It would be desirable to manipulate the informational content via 'purposive sampling and assignment of subjects to various treatments' and examine how 'presentation richness' interacts with 'differentiated content' and personality traits. Also, instead of considering richness as a whole, future researchers need to investigate specifically which factors (eg interactivity) of various media have an impact on a certain type of on-line consumers. Since we predict future interface design of e-business systems would be in a direction toward being automatically adaptive and customisable to every single user in terms of the information content and format, more research on various aspects of individual preferences and personal characteristics in relation to user interface is needed in the near future.

There is a premise in the study that a rich product information presentation environment (subject to appropriateness to the product being offered for sale) is economically viable for all stakeholders to commerce—the consumer, as well as the product provider. Financial constraints may prohibit

either stakeholder types from obtaining/implementing such state-of-the-art interfaces/environments. It is necessary to examine how such a situation can be best handled. There is some recent research that explores how a traditionally lean medium (e-mail) can be used to realise a richer communication environment (Huang, Watson & Wei, 1998); this may be one avenue that may serve as a starting point for further examination.

This study used purchase behaviour as a surrogate for the effectiveness of product information presentation. This study implicitly proposed that effective product information presentation is likely to lead to increased purchase intention and assumed that purchase intention on the Internet is more likely to lead to purchase behaviour in contrast to the time delay that occurs while seeking information from other information sources (such as print advertising) and consequent purchase behaviour. Consumer-buying behaviour should be understood as a process (van Raaij, 1989; Butler & Peppard, 1998). The process from seeing (the effective) product information presentation to actual purchase behaviour was considered to be a black box in this study and analytical investigation of this process was beyond the scope of this study. Further research into this purchase process needs to be explored in detail as an extension to this study in the future.

In conclusion, this article shows that online consumers' personality traits impact effectiveness of the presentation of product information on e-commerce sites. This study proposed and empirically validated relationships among online consumers' personality traits, product information presentation richness and on-line consumer behaviour in e-commerce environments. The study found that effectiveness of product information presentation varies by online consumers' psychological types, and that richer product information presentation significantly influences the online buying behaviour of intuitive types and feeling types, rather than sensing and thinking types.

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## Appendix

### A. personality measurements

In this section are statements that describe various ways in which people feel or act. Circle the answer (A) or (B) that comes closest to how you feel or act. *Note there is no right or wrong answer.*

1. Are you more careful about:
  - A. people's feelings
  - B. their rights
2. When you meet strangers, do you find it:
  - A. something that takes a good deal of effort
  - B. pleasant, or at least easy
3. Does following a schedule:
  - A. appeal to you
  - B. cramp you.
4. Do you usually get along better with:
  - A. imaginative people
  - B. realistic people
5. Are you naturally:
  - A. rather quiet and reserved in company
  - B. a good mixer
6. Is it harder for you to adapt to:
  - A. routine
  - B. constant change
7. Which of these two is the higher compliment:
  - A. he/she is a person of real feeling
  - B. he/she is consistently reasonable
8. Would you judge yourself to be:
  - A. more enthusiastic than the average person
  - B. less excitable than the average person
9. In doing something with many other people, does it appeal more to you:
  - A. to do it the accepted way
  - B. to discover a way of your own
10. Are you at your best:
  - A. when following a carefully worked out plan
  - B. when dealing with the unexpected
11. Do you get more annoyed at:
  - A. fancy theories
  - B. people who do not like theories
12. Is it a higher praise to call someone:
  - A. a person of vision
  - B. a person of common sense
13. Do you more often let:
  - A. your heart rule your head
  - B. your head rule your heart
14. When you think of some little thing you should do or buy, do you:
  - A. often forget it until much later
  - B. usually jot it down on paper before it escapes you
  - C. always carry through on it without any reminders
15. Can you:
  - A. talk easily to almost anyone for as long as you have to
  - B. find a lot to say only to certain people or under certain conditions
16. Do you find it a worse fault:
  - A. to show too much warmth
  - B. to be unsympathetic

17. If you were a teacher, would you rather teach:
  - A. courses involving theory
  - B. fact courses
18. When it is settled well in advance that you will do a certain thing at a certain time do you find it:
  - A. nice to be able to plan accordingly
  - B. a little unpleasant to be tied down
19. Can the new people you meet tell what you are interested in:
  - A. right away
  - B. only after they really get to know you
20. In your daily work, do you (for this item only if two of the following responses are true, mark both):
  - A. rather enjoy an emergency that makes you work against time
  - B. hate to work under pressure
  - C. usually plan your work so you won't need to be under pressure
21. In a large group, do you more often:
  - A. introduce others
  - B. get introduced

**Which word in the following pair appeals to you more? Please circle (A) or (B)**

- |     |                |                   |
|-----|----------------|-------------------|
| 22. | A. compassion  | B. foresight      |
| 23. | A. punctual    | B. leisurely      |
| 24. | A. justice     | B. mercy          |
| 25. | A. production  | B. design         |
| 26. | A. foundation  | B. spire          |
| 27. | A. gentle      | B. firm           |
| 28. | A. uncritical  | B. critical       |
| 29. | A. calm        | B. lively         |
| 30. | A. theory      | B. experience     |
| 31. | A. literal     | B. figurative     |
| 32. | A. imaginative | B. matter-of-fact |

### ***B. purchase intention measurements***

Based on intent to buy the product now given that sufficient money is available.

Likely	1	2	3	4	5	6	7	Unlikely
Improbable	1	2	3	4	5	6	7	Probable

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