User Interfaces for Representing Knowledge Stemming from Debates: Evaluating the Impact of Threading Models (Reviews) on Online Products

Abdulrahman. Alqahtani [1,2]**, and Marius. Silaghi**[2]

[1]Department of Computer Science, Najran University, Najran, Saudi Arabia

[2]Department of Computer Science, Florida Institute of Technology, Melbourne, FL, USA

Abstract—**Most consumers trust online reviews, such as personal recommendations. The main goal of the research described in this paper is to study the impact of reviews of online products for the classification of threading models of electronic debates. We present DirectDemocracyP2P Android application as a user interface for decentralized debates. Based on the results of our online survey of 1027 participants, we found that participants preferred reviews (comments/threads) for online products to be a structured platform, used to help extract a conclusion of arguments around the product. In this paper, we evaluate and analyze the reviews (threads) that were collected from online surveys to improve our DirectDemocracyP2P Android application. Moreover, We discuss the factors that attract users who read or tape reviews (comments/threads) for any given online product.**

Keywords: The techniques to evaluate knowledge representation, User Interfaces for Representing Knowledge, DDP2P, Evaluation of the Impact of Threading Models on Online Products, and Results

I. INTRODUCTION

Many online products made by companies asking customers to leave a review/comment on their site exist. Most of the previous studies focus on the impact of online reviews on product sales. They tend to ignore the structure of user interfaces, and they assume the impact of reviews is the same across different types of online products [1]. Online networks, including Facebook and MySpace, provide an easy way to create circles of friends. These applications enable the people to connect with a worldwide community. However, there are some limitations with respect to privacy issues. PeerSoN Social Networks can be used to solve this privacy issue problem [2], [3]. PeerSoN provides Privacy-Preserving P2P Social Networks to integrate peer-to-peer social networking with ubiquitous computing and delay-tolerant networks [4]. DebateDecide (one of the DDP2P platforms) is a web-based platform for debate threading. It also has a version for client-based viewers called Direct-DemocracyP2P. DirectDemocracyP2P (DDP2P) system is an engine with multiple graphical interfaces [5]. In this paper, we present DDP2P Android application for debate threading.

This study investigates the impact of reviews/threads activity on electronic debates by assessing consumer comments with use of ratings information as a means of evaluating the threading models on online products. However, there are many risks consumers face online today, such as the lack of information between consumers and online sellers, system security issues, poorly designed user interfaces, and fraud [6].

A. Background

Here we present some techniques that can be used to evaluate knowledge representation:

- Surveys: Surveys can be used for knowledge representation evaluation. In 2009, McDonald et al evaluated three formats of privacy policies for six companies. There were 749 internet users for this study and each filled out the survey to evaluate a company's privacy with one format [7].
  In 2005, Janez Brank presented a survey of the state of the art in ontology evaluation [8]. He grouped the ontology evaluation approaches depending on level of evaluation, as follows:
  - Lexical, vocabulary, or data layer:
    This level focused on concepts, instances, facts, etc, which are included in the ontology. Also it considers the vocabulary that is used to represent these concepts. Evaluation in this level involves comparison with different sources of data.
  - Hierarchy or taxonomy: It studies the relation between concepts
  - Other semantic relations:
    This level includes other relations between concepts besides is-a. Evaluation of this level contains measures such as precision and recall.
  - Context or application level:
    The Context level occurs when an ontology becomes part of a huge collection of ontologies, which is mentioned by separate definitions in those

other ontologies. Evaluation at this level may help to take the context into account while evaluating different definitions. application is another form of context where the ontology is to be used.

– Syntactic level:
The Syntactic level matches the syntactic requirements of the particular formal languages that describe the ontology.

– Structure, architecture, design:
This is primarily manually constructed ontologies that evaluate certain pre-defined design principles or criteria for further development.

• Case Studies:
A few case studies exist that have been to improve the knowledge representation evaluation. In 2003, Kim and Chan proposed a way to evaluate reordered Google search results by associating each item with a score provided by clusters of human users and aggregating the total score based on the position of the valuable items [9].

• Panels:
The panel (group of people) can be used to compare different forms of knowledge representation. Bobrow, in his research (a panel on knowledge representation), mentions that he asked panel members to briefly answer three questions in order to compare different forms of knowledge representation [10]. The three panel questions were: "What are the most important premises underlying your approach to knowledge representation, the critical ideas, and major mechanisms used in your system [10]".

In our study we use online surveys to collect the data from online users for evaluation of online product debates to improve the interface of the DDP2P application.

II. USER INTERFACES FOR REPRESENTING KNOWLEDGE

In a DDP2P application, all debates and arguments start with a motion which is relevant to a given organization. Users can vote on it with justifications. Here we introduce an Android application for DDP2P according to motions and justifications that are in the exit organization.

a) Motions:: A motion is a proposal related to a statute, constitutional amendment, or discussion issue that is raised for the vote of a committee or constituency. In some organizations (e.g., U.S. towns), the motions can be submitted to the town council[1] only by a certain number of members of the council. In other organizations (e.g., Swiss towns) a motion can be submitted by any group of citizens who gather signatures [5]. Motions are called to the citizen initiatives available in some organizations (e.g, Florida, California, Switzerland). Proposals for laws that are

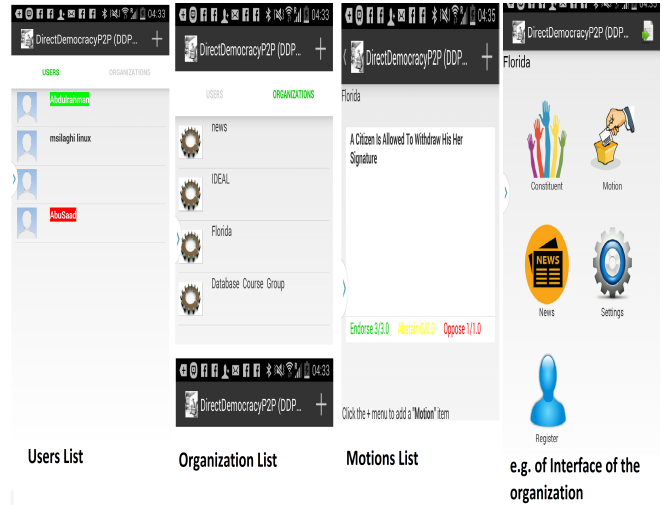[1]The council will move on the motion.

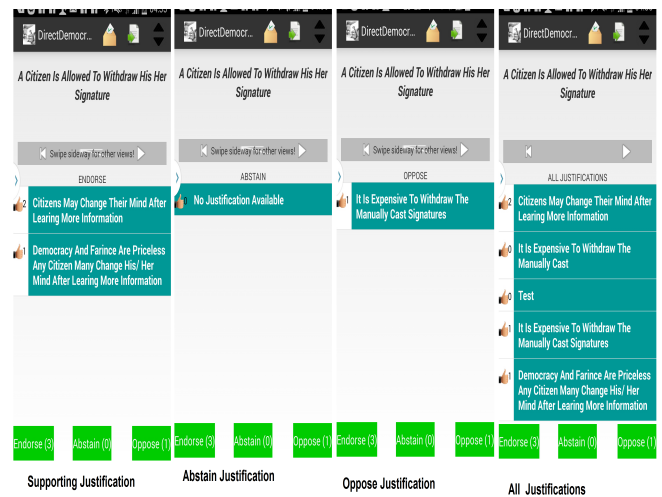Figure 1: User Interfaces for DirectDemocracyP2P Android application1

Figure 2: User Interfaces for DirectDemocracyP2P Android application2

based on a certain number of signatures gathered can be placed on a referendum ballot. DirectDemocracyP2P allows for a motion to be disseminated among the members of a group of peers (the citizens/members of an organization) for collecting signatures in view of a potential submission for a vote.

Prior to moving on a motion, in general, one only gathers support signatures for it. That does not allow for the debates and collaborative filtering that is needed when a large number of motions may be vehiculated. The traditional ways to filter the motions are:

• Only enable the members of a small committee to

submit motions (e.g., town councils, parliaments)

- Request a large number of signatures prior to moving on the motion, the cost of which filters out poorly financed or very unpopular proposals (e.g., citizen initiatives and statutory petitions)

The first type of filter (reduction to a small committee) reduces the quality of the democracy and the trend is to abandon it for the second type [5]. The second approach also reduces the democracy when it reduces itself to barriers based on high financing requirements. When signatures can be gathered using social media, the financing differences are leveled and the motions compete solely based on their popularity/support. However, the number of motions raised to the attention of eligible supporters is now expected to increase, and new filtering mechanisms are required to increase the visibility of meritorious ones.

Various social media (e.g., news forums, Amazon) are already facing this problem of abundance of inputs (proposals, comments), and mechanisms of collaborative filtering are popular under the form of voting on entries. However, most of these social media are easily attacked by *response rate manipulation*, when interested peers can spam the channel with large numbers of submissions.

In the case of motions, similar mechanisms based on enabling negative voting (besides the positive support, which is the final purpose), can yield an appropriate filtering. Moreover, if each constituent is restricted to one single current input (which is appropriate with votes or signatures on one motion), then the response rate manipulation can be reduced even more.

The mechanism of disseminating motions can be used to help the community converge towards enhanced versions. Discovery of better versions of a motion can be boosted by an appropriate threading mechanism, where each new motion can refer to the previous motions on which it claims to improve. These references create a thread that can be traversed by a user, or can be used by automatic reasoning tools that can help users in locating promising motions.

b) Justifications:: One of the benefits of gathering votes for a motion is that constituents can get an understanding concerning the position of their peers, and therefore better grasp the implications of a given motion on their organization and on peer members. Namely, if they see that many peer members disagree with a motion that they consider to be obviously good, they may think twice and potentially discover problems with that motion, problems which can make the constituent withdraw his/her support. Withdrawing support for an unpopular motion will save the time of the other constituents who will be less tempted to spend time reading it and will save the organization the money needed to move on it and organize an official ballot.

Understanding the opinion of one's peers can be further enhanced by enabling the submitters of votes to associate a *justification* of their support or opposition to the motion.

Since each constituent can submit a single current vote for the motion, it can become acceptable for them to only have one current justification (measure that can help to tame the *response rate manipulation* attacks). Since the existence of a large number of constituents in some organizations can lead to large numbers of justifications, it is important to also enable additional collaborative filtering mechanisms for justifications. In DirectDemocracyP2P, users can support somebody else's justification, as an alternative to providing his/her own justification. Justifications with a large base of support can be favored by viewers, as they may better represent the opinion of the group.

A further mechanism to help users locate relevant justifications is based on threading (just as with the enhanced motions). Namely new justifications can point to old justifications that they claim to refute or enhance. Thereby people visualizing old justifications are notified of the presence of the refutation and enhancement claims.

Common (and DirectDemocracyP2P default) alternatives when voting on a motion are *Support, Oppose*, and *Abstain*. However each submitted motion can be customized to allow for any set of possible reactions as appreciated by its designer. Poor choices are supposed to be correctable by enhancements.

c) Problem: The problem that emerges is to scientifically decide whether the collaborative filtering mechanisms proposed in debate systems truly offer the enhancements for which they were proposed.

III. METHODOLOGY

A survey is the best tool that can be used to collect data for program improvement. A survey process has five main steps of designing and implementing a survey [11]:

- Design Survey Process
- Develop Questions
- Test/Train
- Collect Data
- Analyze Data

Any type of survey for a specific objective is the result of making decisions based on the following techniques:

- Contacting information (Email, telephone, mail, etc.)
- Submitting the questions (writing, typing, interview)
- Recording answers (paper, voice, video)

The researcher can use one of these three techniques according to his/her research goals and timeline. Also, the choice of technique may affect the quality, cost, and timeliness of results. In our study we use the second technique (submitting the questions) in an online survey to collect the data from online users.

A. Evaluation of the Impact of Threading Models on Online Products

We collected the information through an online survey from May to June 2015 in which we presented a survey to

participants and asked them to answer its questions. We used Survey Monkey for designing the questions. All questions of the survey were multiple choice. Reading questions was a requirement for completing an online survey. We designed one question as a test for validation of our survey. We designed and distributed questionnaires in our survey in a couple of languages (English and Arabic) to track in which language a participant took the survey, since most of our media network members knew one or both of these two languages. This element allows you to track in which language a participant takes the survey.

B. Study Questions

Study questions contained three groups:

- Participation Agreement
  The first question in our survey is a participation agreement. Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.
- General Information: We collected general information like gender, age range, secondary language, and level of education to evaluate our survey population. Also, this general information will help us to build the user interfaces of the DDP2P Android application according to the level of people who deal with reviews (threads).
- Understanding Questions: Participants answered a chain of multiple choice questions to determine the factors that attract the users while reading or taping reviews (comments/threads) for any online product. These factors will help us to improve our DirectDemocracyP2P Android application.

C. Goals of Our Survey

Each question of our survey was used to measure two things:

- How to evaluate the debate of reviews for online products.
- How to improve user interfaces for debate application which is a DD2PP Android application in our case.

IV. Results and Discussion

A. Participation Agreement (Institutional Review Board (IRB))

The first question in our survey asked the user to accept a participation agreement.

We asked:
Do you agree to the above terms? By clicking Yes, you consent that you are willing to answer the questions in this survey.

Key Finding:
98 percent accepted to answer our survey.
2 percent rejected to participate in our survey.

Analysis:
Most of the participants accepted to answer the questions in our survey (1006 of 1027) as shown in Figure 3. This was an easy question because this question confirmed the participation in our survey.
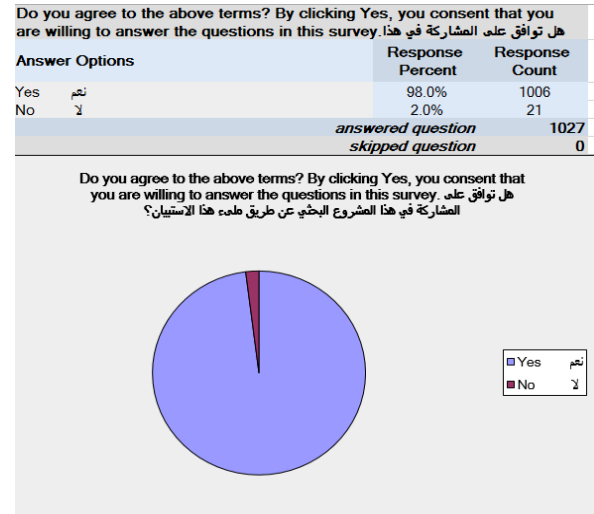
Figure 3: Institutional Review Board (IRB)

B. General Information:

There were four questions about general information. Every question had to fulfill the purpose of the study.

1) Gender: This question aimed to know who was more active in the debate, men or women. This question will help to structure debate user interfaces (DDP2P applications) according to the interaction of humans.
We asked: What is your gender?
Key Finding:
78.5 percent of participants were male.
21.5 percent of participants were female.
Analysis:
The majority of participants were male from both languages of the survey (725 of 924) as shown in Figure 4. This meant males were more willing to debate than females, according to this survey. This question will lead to focusing on men more, by using ads, news, topics, etc, in a debate user interface (DDP2P applications), in order to attract them into successful debates.

2) Age Range: the age range question targeted the age range of participants who are willing to debate.
We asked: What is your age range?
Key Finding:
4.3 percent of participants were less than 20.
30.3 percent of participants were between 20 and 30.
50.3 percent of participants were over than 30.
Analysis:
The greatest age range of participants, who were willing to

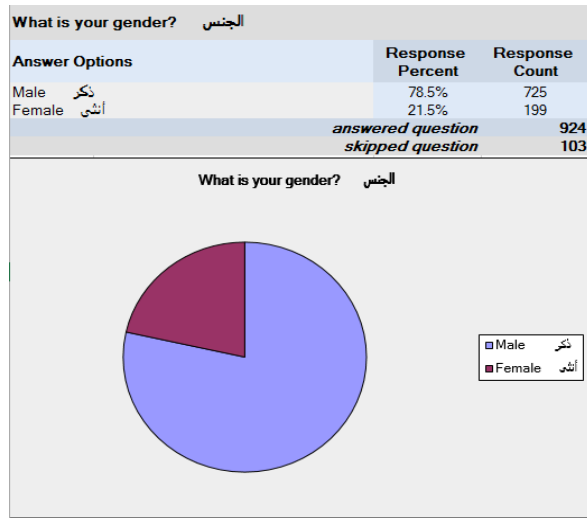| What is your gender? الجنس		
Answer Options	**Response Percent**	**Response Count**
Male ذكر	78.5%	725
Female أنثى	21.5%	199
answered question		924
skipped question		103

Figure 4: Gender percent of participants in our survey

debate in this study, was older than 30 (465 of 924), then between 20 and 30 (419 of 924) as shown in Figure 5.

This question gave us the age range of participants whom we should focus on when we improve the user interface of DDP2P applications.
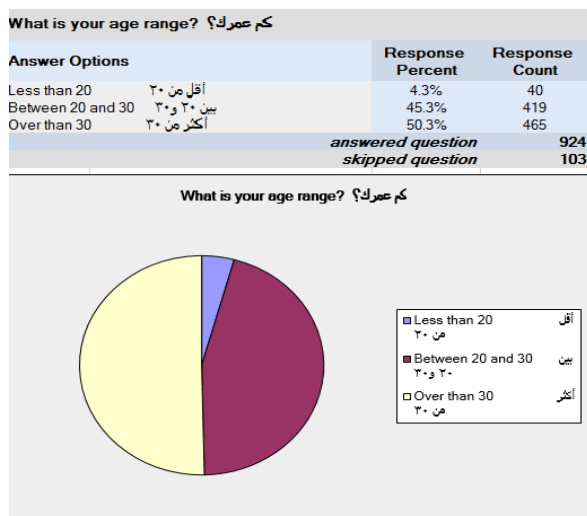
What is your age range? كم عمرك؟		
Answer Options	**Response Percent**	**Response Count**
Less than 20 أقل من ٢٠	4.3%	40
Between 20 and 30 بين ٢٠ و٣٠	45.3%	419
Over than 30 أكثر من ٣٠	50.3%	465
answered question		924
skipped question		103

Figure 5: Age Range of participants in our survey

3) Secondary Language: The secondary language question aimed to discover which languages are the most popular in the debate.

We asked: What is your secondary language, if any?

Key Finding:

78.5 percent of participants whose second language was English.

0.2 percent of participants whose second language was Chinese.

0.8 percent of participants whose second language was French.

1.5 percent of participants whose second language was Spanish.

11.1 percent of participants whose second language was Other.

Analysis:

We found English was the most popular language in our study (798 of 924) as shown in Figure 6. From this question, in DDP2P applications, we will suggest using English as a formal language to communicate between users. Also, we will put English as the default user interface for DDP2P applications.

What is your secondary language, if any? ماهي لغتك الثانوية		
Answer Options	**Response Percent**	**Response Count**
English الأنجليزية	86.4%	798
Chinese الصينية	0.2%	2
French الفرنسية	0.8%	7
Spanish الأسبانية	1.5%	14
Other (please specify) (الرجاء التحديد) أخرى	11.1%	103
answered question		924
skipped question		103
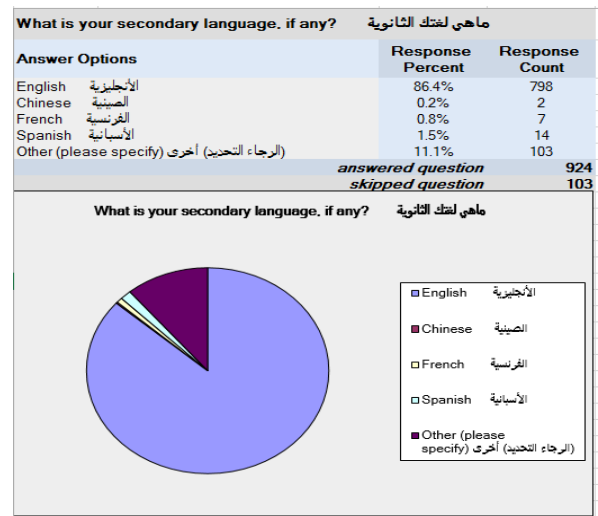
Figure 6: Secondary Language of participants in our survey

4) Level of the Education: The level of education question referred to the impact of level of education on the debate.

We asked: What is your education level?

Key Finding:

15 percent of participants have a High School degree

51.1 percent of participants have a Bachelor's degree

27.1 percent of participants have a Master's degree

6.8 percent of participants have a Ph.D degree

Analysis:

Most participants have a Bachelor's degree (472 of 924) as shown in Figure 7. This question showed us that most participants could be familiar with any updates or developments for improving the user interface of DDP2P applications because the majority of participants had a Bachelor's degree.

C. Survey Validity

We had a question to test the validity of our online survey. The validity question depended on asking questions which measured what we were supposed to be measuring.

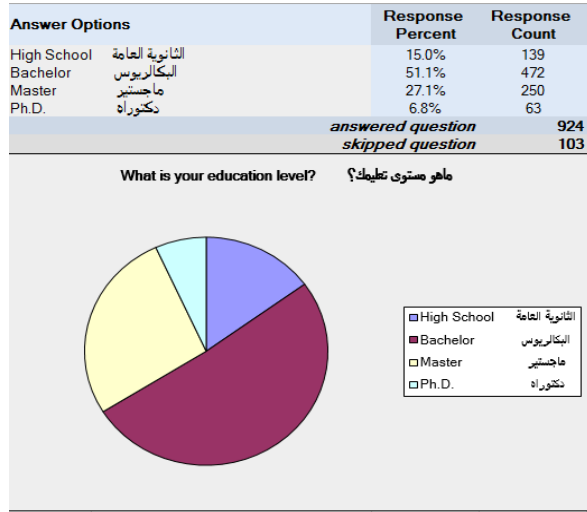| Answer Options		Response Percent	Response Count
High School	الثانوية العامة	15.0%	139
Bachelor	البكالريوس	51.1%	472
Master	ماجستير	27.1%	250
Ph.D.	دكتوراه	6.8%	63
	answered question		924
	skipped question		103

Figure 7: Level of Education of participants in our survey

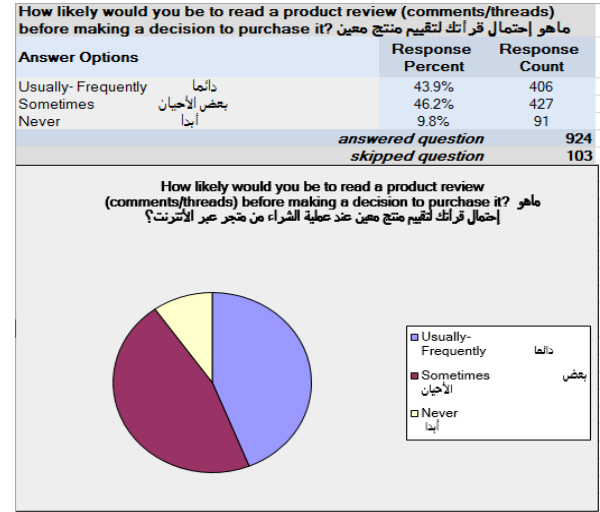| How likely would you be to read a product review (comments/threads) before making a decision to purchase it? ماهو إحتمال قرأتك لتقييم منتج معين؟			
Answer Options		Response Percent	Response Count
Usually- Frequently	دائما	43.9%	406
Sometimes	بعض الأحيان	46.2%	427
Never	أبدا	9.8%	91
	answered question		924
	skipped question		103

Figure 8: The Validity of our Survey

We asked: How likely would you be to read a product review (comments/threads) before making a decision to purchase it?

Key Finding:
43.9 percent of participants usually read a product review (comments/threads) before making a decision to purchase it
46.2 percent of participants sometimes read a product review (comments/threads) before making a decision to purchase it
9.8 percent of participants never read a product review (comments/threads) before making a decision to purchase it.

Analysis:
The result of this question referred to whether the majority of participants would read a product review "Usually" (409 of 924) or "Sometimes" (427 of 927) as shown in Figure 8. Whoever answered "Never" for this question could not continue to the next series of questions because the remaining questions focused on actual readers of product reviews.

D. Threads Questions:

We have several questions which focused on reviews of online products. Our samples were the participants who read reviews. They were supposed to answer a chain of multiple choice questions to determine the factors that attract users while reading or taping reviews (comments/threads) for any online products. The results of those questions will help us to improve our DirectDemocracyP2P applications.

1) Trusting the Justifications: Fifty-three percent of participants were trusted to read a brief review (388 of 720) as shown in Figure 9.

We asked: What types of reviews (comments/threads) do you trust the most?

Key Finding:
53.9 percent of participants were trusted to read a brief review.

37.1 percent of participants were trusted to read a long review.

9.0 percent of participants were not likely to trust any online review

Analysis:
Designing the brief review by Limiting the length of the motion will help to attract users to debate according to the results of this question. Limitation of the length of the debate arguments will directly affect users' acquisition and, in turn, trusting the justifications about any given motion in the DDP2P applications.

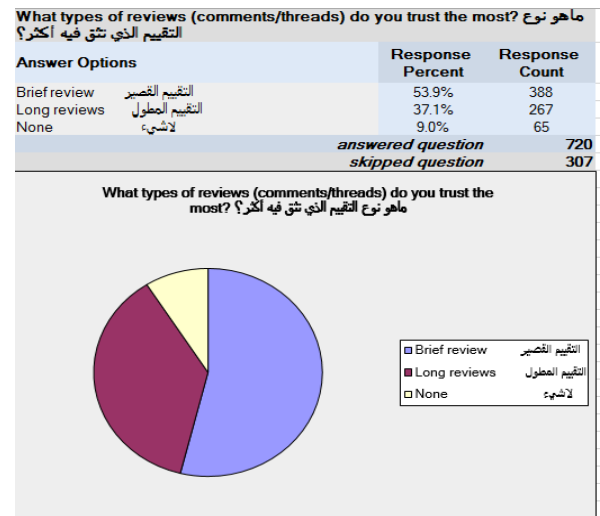| What types of reviews (comments/threads) do you trust the most? ماهو نوع التقييم الذي نثق فيه أكثر؟			
Answer Options		Response Percent	Response Count
Brief review	التقييم القصير	53.9%	388
Long reviews	التقييم المطول	37.1%	267
None	لاشيء	9.0%	65
	answered question		720
	skipped question		307

Figure 9: Trusting the Justifications

2) Sorting the Important Justification : Most users would read up to 10 reviews according to the results of this question

(558 of 720) as shown in Figure 10.

We asked: How many reviews (comments/threads) do you normally read before buying a specific product from an online store?

Key Finding:

37.4 percent of participants read 5 or less reviews before buying a specific product from an online store

36.4 percent of participants read 10 or less reviews before buying a specific product from an online store

20.8 percent of participants read more than 10 reviews before buying a specific product from an online store

5.4 percent of participants do not read reviews before buying a specific product from an online store.

Analysis:

In DDP2P applications, sorting the important justifications among the top ten justifications (around a given motion) will give the user opportunity to read them.
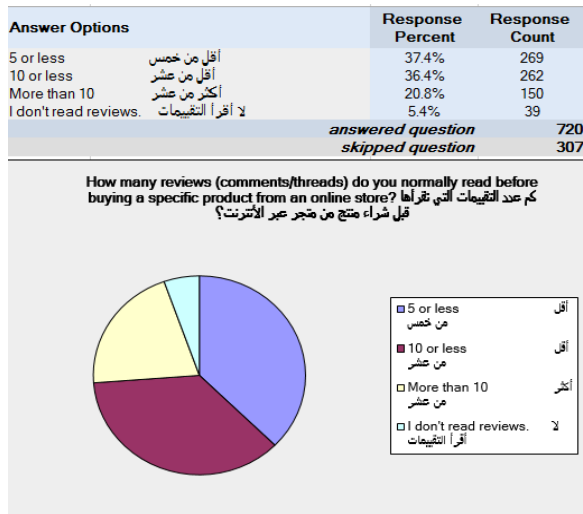

Figure 10: Sorting the Important Justification

3) Separating the Justification: Seventy-one percent of participants were likely to read both sides of the arguments (Positive or Negative Reviews)for any debate (517 of 720) as shown in Figure 11.

We asked: When you read reviews (comments/threads) for a product, do you focus on positive reviews or negative reviews?

Key Finding:

11.8 percent of participants were likely to read positive sides of arguments for any debate.

16.4 percent of participants were likely to read negative sides of arguments for any debate.

71.8 percent of participants were likely to read both sides of arguments (Positive or Negative Reviews) for any debate.

Analysis:

In DDP2P applications, we have already separated the jus-

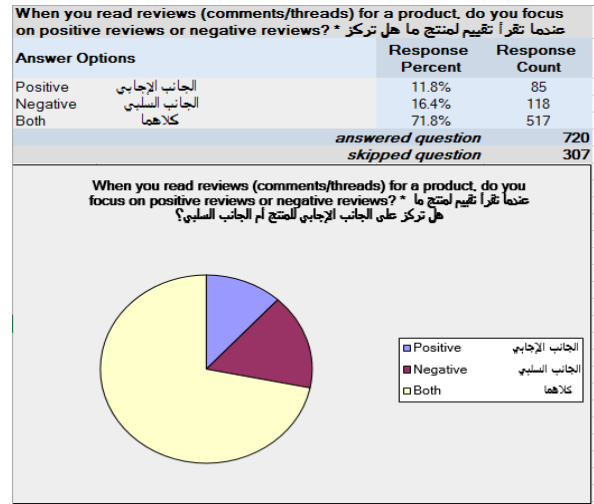tification on a motion whether *Support, Oppose,* or *Abstain.*

Figure 11: Separating the Justification

4) Showing the number of Justifications and Witnesses: Fifty-five percent of participants agreed with the statement, "Would a number of positive reviews (comments/threads), the number of stars, or other rating criteria, be enough for you to buy a specific product from an online store?" (517 of 720) as shown in Figure 12.

We asked: Are a number of positive reviews (comments/threads), the number of stars, or other rating criteria, enough for you to buy a specific product from an online store?

Key Finding:

55.4 percent of participants answered (Yes).

44.6 percent of participants answered (No).

Analysis:

Showing a number of positive reviews (comments/threads), the number of stars, or other rating criteria will attract users to read and write reviews and make good arguments. In DDP2P, a number of justifications, the number of witnesses, or other rating criteria should be shown in the first page of the user interface for the motion.

5) Form for Attention-Grabbing-Words: Sixty-one percent of participants would be attracted by any type of online product reviews (Positive or Negative Words)(447 of 720) as shown in Figure 13.

We asked: What types of words attract you the most while reading reviews (comments/threads) for any online product?

Key Finding:

22.1 percent of participants were attracted by positive words of arguments.

15.8 percent of participants were attracted by negative words of arguments.

62.1 percent of participants were attracted by both sides of

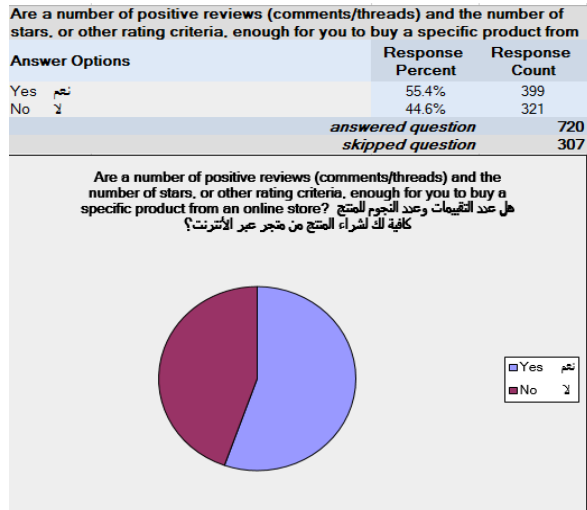| Are a number of positive reviews (comments/threads) and the number of stars, or other rating criteria, enough for you to buy a specific product from		
Answer Options	**Response Percent**	**Response Count**
Yes نعم	55.4%	399
No لا	44.6%	321
answered question		720
skipped question		307

Figure 12: Showing a number of positive reviews (comments/threads) and the number of stars, or other rating criteria

arguments (Positive or Negative words).

Analysis:

In DDP2P applications, we could design a form for attention-grabbing-words which would attract users to become more involved in the debate.

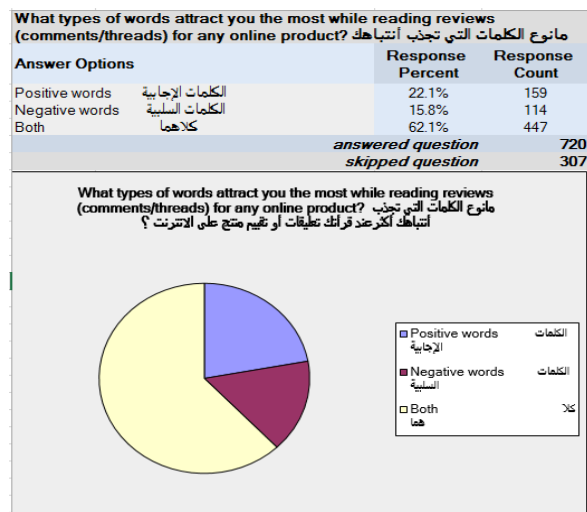| What types of words attract you the most while reading reviews (comments/threads) for any online product? مانوع الكلمات التي تجذب أنتباهك		
Answer Options	**Response Percent**	**Response Count**
Positive words الكلمات الإجابية	22.1%	159
Negative words الكلمات السلبية	15.8%	114
Both كلاهما	62.1%	447
answered question		720
skipped question		307

Figure 13: Types of words that attract users

6) Form for emphasizing words: Forty-seven percent of participants would expand words for emphasis while the same percentage would never do that as shown in Figure 14.
We asked: When you type a comment in reviews (comments/threads) for any online product, do you expand some words for emphasis? For example verrrrrrrrrrrry
Key Finding:

5.6 percent of participants were always likely to expand some words for emphasis when they typed a comment in online reviews.

47.2 percent of participants were sometimes likely to expand some words for emphasis when they typed a comment in online reviews.

47.2 percent of participants were never likely to expand some words for emphasis when they typed a comment in online reviews.

Analysis:

In DDP2P applications, we can design a form for emphasizing words which will attract users to become more involved in the debate.

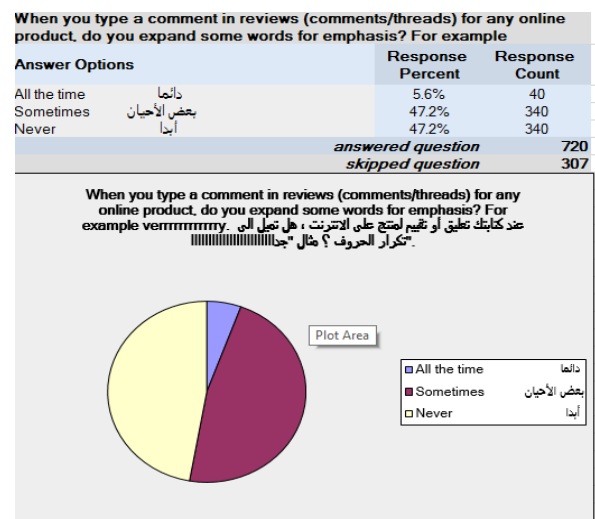| When you type a comment in reviews (comments/threads) for any online product, do you expand some words for emphasis? For example		
Answer Options	**Response Percent**	**Response Count**
All the time دائما	5.6%	40
Sometimes بعض الأحيان	47.2%	340
Never أبدا	47.2%	340
answered question		720
skipped question		307

Figure 14: Expanding some words for emphasis

7) Form for Translating Words of the User Region: Fifty-three percent of participants would use argot language from their region (385 of 720) as shown in Figure 15.
We asked: When you type a comment in a review (comments/threads) for any online product, do you use argot language from your region?
Key Finding:

41.2 percent of participants were always likely to use argot language from their region.

53.5 percent of participants were sometimes likely to use argot language from their region.

32.4 percent of participants were never likely to use argot language from their region.

Analysis:

In DDP2P applications, we should design a form for translating words of the user's region to English, and give some space to clarify these words (enhancement).

8) Form for Supporting Translation: Sixty-eight percent of participants were never likely to use words from other languages (385 of 720) as shown in Figure 16. **We asked:** When you type a comment in a review (comments/threads)
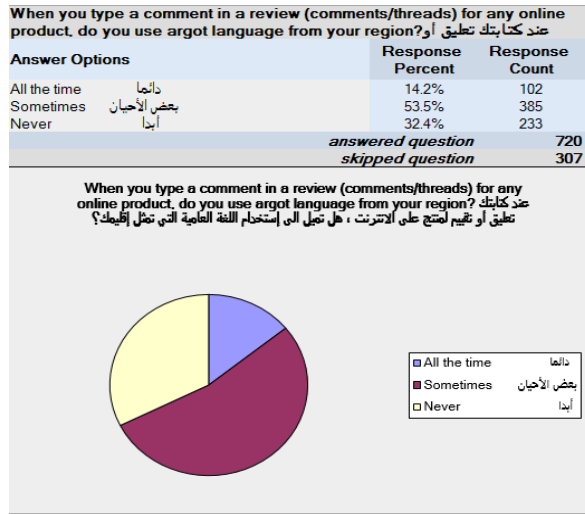
Answer Options		Response Percent	Response Count
All the time	دائما	14.2%	102
Sometimes	بعض الأحيان	53.5%	385
Never	أبدا	32.4%	233
	answered question		720
	skipped question		307

When you type a comment in a review (comments/threads) for any online product, do you use argot language from your region? عند كتابتك لمنتج أو تقييم على الانترنت ، هل تميل الى إستخدام اللغة العامية التي تمثل إقليمك؟

- All the time دائما
- Sometimes بعض الأحيان
- Never أبدا

Figure 15: Using argot language from user region

for any online product, do you use some words from other languages?

Key Finding:

3.3 percent of participants were always likely to use words from other languages

28.3 percent of participants were sometimes likely to use words from other languages

68.3 percent of participants were never likely to use words from other languages

Analysis:

In DDP2P applications, we should design a form for supporting translation of words of the users' languages, and give the users space to explain these words (explanation).
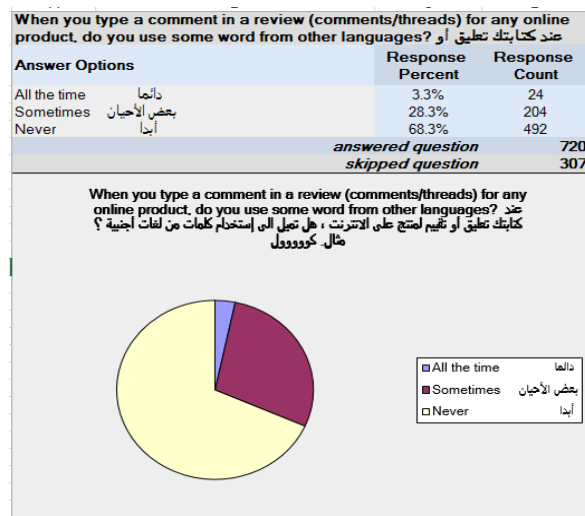
When you type a comment in a review (comments/threads) for any online product, do you use some word from other languages? عند كتابتك تعليق أو؟

Answer Options		Response Percent	Response Count
All the time	دائما	3.3%	24
Sometimes	بعض الأحيان	28.3%	204
Never	أبدا	68.3%	492
	answered question		720
	skipped question		307

When you type a comment in a review (comments/threads) for any online product, do you use some word from other languages? عند كتابتك تعليق أو تقييم لمنتج على الانترنت ، هل تميل الى إستخدام كلمات من لغات أجنبية ؟ مثال. كروووول

- All the time دائما
- Sometimes بعض الأحيان
- Never أبدا

Figure 16: Using any word from other languages

9) Benefit of Study Threads: Forty-percent of participants said that reviews about any online products are positive reviews while thirty-six percent described online reviews as serious reviews. A few participants considered online reviews as negative reviews as shown in Figure 17.

We asked: From your perspective, how would you generally describe reviews (comments/threads) about any online product?

Key Finding:

37.2 percent of participants described online reviews as serious reviews

40.4 percent of participants described online reviews as positive reviews

9.0 percent of participants described online reviews as negative reviews

Analysis:

The results of this question gave us the benefit of studying online reviews (comments/threads). There are a lot of users who trust online reviews, especially if they are serious and positive reviews.
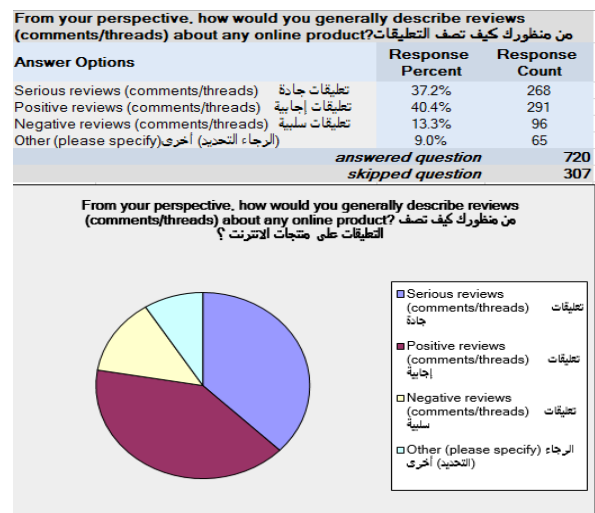
From your perspective, how would you generally describe reviews (comments/threads) about any online product? من منظورك كيف تصف التعليقات؟

Answer Options		Response Percent	Response Count
Serious reviews (comments/threads)	تعليقات جادة	37.2%	268
Positive reviews (comments/threads)	تعليقات إجابية	40.4%	291
Negative reviews (comments/threads)	تعليقات سلبية	13.3%	96
Other (please specify)	(الرجاء التحديد) أخرى	9.0%	65
	answered question		720
	skipped question		307

From your perspective, how would you generally describe reviews (comments/threads) about any online product? من منظورك كيف تصف التعليقات على منتجات الانترنت ؟

- Serious reviews (comments/threads) تعليقات جادة
- Positive reviews (comments/threads) تعليقات إجابية
- Negative reviews (comments/threads) تعليقات سلبية
- Other (please specify) الرجاء (التحديد) أخرى

Figure 17: Benefit of Study Reviews/Threads

10) Structured/Unstructured Platform for Threads: Fifty-six percent of participants were likely to prefer reviews (comments/threads) for online products to be structured platforms, which could be a specific question that the user should answer or comment on. Structured platforms helped extract a conclusion of arguments around the product as shown in Figure 18.

We asked: How do you prefer reviews (comments/threads) for online products to be structured platforms or unstructured platforms?

Key Finding:

56.9 percent of participants preferred reviews (comments/threads) for online products to be structured platforms

43.1 percent of participants preferred reviews (com-

ments/threads) for online products to be unstructured platforms

Analysis:

Forty-one percent of participants were likely to prefer reviews (comments/threads) for online products to be unstructured platforms. In DDP2P applications, we should have those two types of platforms. Unstructured platforms could be used for peers to join or create any organizations/motions, and structured platforms could be used for voting to post only one justification for any given motion, and whether they support it or are against it.
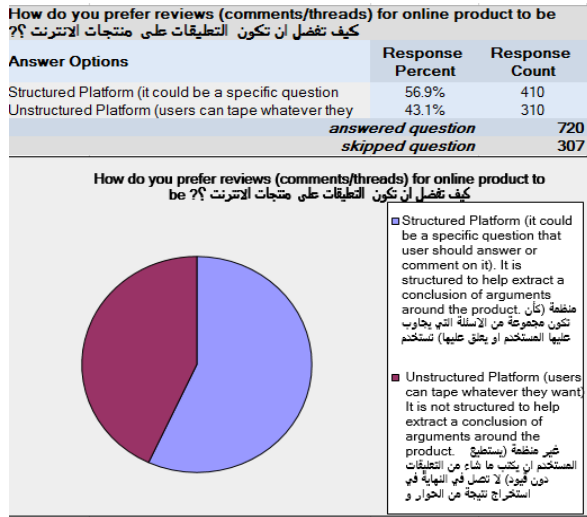

Figure 18: Structured/Unstructured Platform for Reviews/Threads

V. Acknowledgment

We are sincerely grateful to Dr. Muzaffar Shaikh, Dr. John Lavelle, Dr. Khalid Abuhasel for their support and sharing their truthful and illuminating view on a number of issues related to the survey.

VI. Conclusion

Here we have analyzed the impact of reviews (threads) for online products based on an online survey. While online platforms utilize comments to support or negate the author's message and/or other comments in the thread, none of them have been analyze for threading models. We have presented DDP2P Android applications as a user interface for decentralized debates. In our survey we provided some measure that may be used to evaluate the debate system. Also, we have mentioned the following suggestions and techniques that may be used to improve DDP2P applications:

- Limitation of the Words of Debate Arguments.
- Sorting the Important Justifications among the Top Ten Justifications
- Separating the Justification

- Showing the Number of Justifications and Witnesses
- Form for Attention-Grabbing-Words
- Form for emphasizing words
- Form for Translating Words of the User Region
- Form for Supporting Translation
- Benefit of Study Threads
- Structured/Unstructured Platform for Threads

References

[1] A. J. Flanagin, M. J. Metzger, R. Pure, and A. Markov, "User-generated ratings and the evaluation of credibility and product quality in ecommerce transactions," in *System Sciences (HICSS), 2011 44th Hawaii International Conference on*. IEEE, 2011, pp. 1–10.

[2] G. Kreitz, O. Bodriagov, B. Greschbach, G. Rodríguez-Cano, and S. Buchegger, "Passwords in peer-to-peer," in *Peer-to-Peer Computing (P2P), 2012 IEEE 12th International Conference on*. IEEE, 2012, pp. 167–178.

[3] B. Greschbach, G. Kreitz, and S. Buchegger, "The devil is in the metadataâĂŤnew privacy challenges in decentralised online social networks," in *Pervasive Computing and Communications Workshops (PERCOM Workshops), 2012 IEEE International Conference on*. IEEE, 2012, pp. 333–339.

[4] S. Buchegger, D. Schiöberg, L.-H. Vu, and A. Datta, "Peerson: P2p social networking: early experiences and insights," in *Proceedings of the Second ACM EuroSys Workshop on Social Network Systems*. ACM, 2009, pp. 46–52.

[5] M. C. Silaghi, K. Alhamed, O. Dhannoon, S. Qin, R. Vishen, R. Knowles, I. Hussien, Y. Yang, T. Matsui, M. Yokoo *et al.*, "Directdemocracyp2pâĂŤdecentralized deliberative petition drivesâĂŤ," in *Peer-to-Peer Computing (P2P), 2013 IEEE Thirteenth International Conference on*. IEEE, 2013, pp. 1–2.

[6] Z. Lee, I. Im, and S. J. Lee, "The effect of negative buyer feedback on prices in internet auction markets," in *Proceedings of the twenty first international conference on Information systems*. Association for Information Systems, 2000, pp. 286–287.

[7] A. M. McDonald, R. W. Reeder, P. G. Kelley, and L. F. Cranor, "A comparative study of online privacy policies and formats," in *Privacy enhancing technologies*. Springer, 2009, pp. 37–55.

[8] J. Brank, M. Grobelnik, and D. Mladenić, "A survey of ontology evaluation techniques," 2005.

[9] H. R. Kim and P. K. Chan, "Learning implicit user interest hierarchy for context in personalization," in *Proceedings of the 8th international conference on Intelligent user interfaces*. ACM, 2003, pp. 101–108.

[10] D. G. Bobrow, G. G. Hendrix, W. A. Martin, J. McCarthy, A. Newell, R. Schank, B. C. Smith, and N. Sridharan, "A panel on knowledge representation," in *Proceedings of the 5th international joint conference on Artificial intelligence-Volume 2*. Morgan Kaufmann Publishers Inc., 1977, pp. 983–992.

[11] N. Thayer-Hart, J. Dykema, K. Elver, N. Schaeffer, and J. Stevenson, "Survey fundamentals: A guide to designing and implementing surveys," *Office of Quality Improvement*, 2010.