Exhibit 1

CONTAINS CONFIDENTIAL BUSINESS INFORMATION
SUBJECT TO PROTECTIVE ORDER

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA, SAN JOSE DIVISION

APPLE INC., a California corporation,

Plaintiff,

vs.

SAMSUNG ELECTRONICS CO., LTD., a Korean business entity; SAMSUNG ELECTRONICS AMERICA, INC., a New York corporation; SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, a Delaware limited liability company,

Defendant.

CASE NO. 11-cv-01846-LHK

EXPERT REPORT OF R. SUKUMAR REGARDING THE AMOUNT SAMSUNG CUSTOMERS WOULD BE WILLING TO PAY FOR THE FEATURES ASSOCIATED WITH PATENT NOS. U.S. 7,844,915, U.S. 7,469,381, U.S. 7,864,163, AND U.S. 7,663,607

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I. Assignment

1. I have been asked by attorneys representing Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Telecommunications America, LLC (collectively, "Samsung") to evaluate the expert report submitted by Professor John R. Hauser. In particular, counsel for Samsung has asked me to evaluate the two surveys – one for smartphones and one for tablets – conducted by Professor Hauser, including the survey design, data generated by the surveys, and the analysis and conclusions presented by Professor Hauser in his expert report, in which he attempts to estimate the amount that his sample of existing Samsung consumers would be willing to pay for the allegedly infringing features associated with the patents at issue.

II. Qualifications

2. I am the Chief Executive Officer of Optimal Strategix Group, Inc., which is a strategic market research and marketing consulting company. Prior to becoming the Chief Executive Officer of Optimal Strategix Group, Inc., I served as a Professor of Marketing at a number of Universities and as the Associate Dean for Academic Programs at the Indian School of Business ("ISB"). I have served as a consultant for many Fortune 500 companies, helping clients understand the value of the products they offer, designing and developing new products and services, setting pricing and promotional strategies, and evaluating their brand marketing strategies. I have also served as an expert conducting survey research for cases that have involved patent infringement. My CV is attached as Exhibit A. My CV contains a list of my publications from the last 10 years.

Optimal Strategix Group, Inc. is being compensated for my time in this matter at the rate of $650 per hour. My expenses arising from my involvement in this case are being reimbursed. No portion of my fees is dependent upon the outcome of this case.

III. Summary of Opinions

My overall opinions are summarized as follows:

3. Professor Hauser's surveys do not accurately describe the patented features of the utility patents at issue, which renders his overall analysis and results unreliable for purposes of estimating consumer willingness to pay for those features.

4. Professor Hauser's report does not provide the details of the in-depth interviews ("IDI") purportedly conducted with twenty current Samsung customers. Professor Hauser also does not provide any details of the pre-test results. Absent these details on the interviews and the pre-test results, which would typically be presented in a rigorous and scientific study, it is not possible to fully replicate and validate Professor Hauser's results; consequently, his results are not reliable.

5. Professor Hauser's conjoint exercise presented features to respondents like "camera" and "connectivity" which are complex and were likely confusing to respondents, as they do not represent a single characteristic of the product. For example, "connectivity" includes various discrete features, such as Cellular service, WiFi, Tethering, MicroUSB port, HDMI output port for iPhones and WiFi, Bluetooth, Micro USB, and HDMI for iPads, which are not mutually exclusive or collectively exhaustive.

6. What is more, by providing videos for some features, and graphics for others, Professor Hauser likely further confused respondents and created information overload in his surveys. Consequently, due to information overload and the fact that the choices in the conjoint exercise were likely not clearly understood by respondents, the survey answers are not likely to

provide a true representation of the factors that drive purchase decisions. They are also unlikely to be representative of the current market, rendering Professor Hauser's results unreliable.

7. Professor Hauser's surveys disqualify respondents if the age or gender entered does not match the respondent parameters given by the panel provider[1], Research Now. Professor Hauser's report, however, does not describe how respondents were removed from the final data set. Additionally Professor Hauser does not provide any demographic data, such as age or gender, from those terminated from the survey. In the absence of a clearly defined process for removing these respondents from the final dataset as well as the actual screening data, it is not possible to validate the accuracy of the final data Professor Hauser used in his analysis, therefore his results are unreliable.

8. Professor Hauser's surveys are not complete in that they do not ask respondents whether they use any of the allegedly infringing features (or, for that matter, are even aware of these features). For example, a respondent may indicate in a choice exercise that they would be likely to purchase a product with a particular feature, but in reality the respondent may never use the feature. Professor Hauser's surveys do not ask respondents whether any of the alleged features are used by the respondents. As a result, the estimated willingness-to-pay for features that customers do not use would likely be higher because respondents who are not aware or do not use these features are more likely to find these features novel, resulting in a higher estimated willingness to pay.

9. Professor Hauser's sample is biased and not representative of the population of potential Samsung customers. Professor Hauser's surveys under-represent female users and over-represent younger age groups. Professor Hauser's analysis fails to control for other relevant

[1] Hauser Report, Exhibit D at 103 and Exhibit E at 120.

demographic characteristics, including income, ethnicity and education levels. These sources of sample bias and failures to control for relevant demographic characteristics render Professor Hauser's analysis unreliable.

10. Professor Hauser uses a simulation approach based on the part-worths to calculate willingness to pay (WTP) (Hauser Report, pp 51 Item 98)[2] Professor Hauser describes the simulation approach to consist of two otherwise identical products, but one includes the patented features and the other does not. The presence of only two products in the simulation, in a market represented by many more products, would incorrectly inflate the market's value of the attribute improvement

11. Additionally, Professor Hauser uses a median value of the WTP to support his simulation approach. This value will not be representative of the entire market, especially when substantial numbers of the respondents have values that are much lower than the median value suggested in Professor Hauser's report (page 19). Under Professor Hauser's approach to calculate the WTP, there is no single market valuation of these features, but a large number of values close to or even less than zero and a substantial number of very high values. The wide variation in these results, and especially the fact that substantial numbers of the results are negative and substantial numbers are clearly unreasonably large, indicate that Professor Hauser's analysis is unreliable.

12. Professor Hauser's sample does not represent the distribution of actual sales for the models accused of infringing Apple's utility patents at issue. Specifically, there is systematic over-sampling of high priced models and underrepresentation of lower priced models. This is

[2] "The observed utility is the sum of the partial contributions of each feature and price (the effect of price is negative). The partial contribution of a level of a feature is known as a "partworth." (Hauser Report ¶ 20).

likely to cause inflation in his willingness-to-pay estimates. An appropriate approach would be to weight the data. Developing weights would require balancing the sample across various respondent groups, as well as the models they purchase. Professor Hauser failed to do this, which renders his results unreliable.

13. The opinions in this report are based on my knowledge, review and analysis of the relevant information and data provided, and my education, training, and commercial experience. I reserve the right to supplement this report should additional information become available.

IV. Background

A. Professor Hauser's Surveys

14. Professor Hauser purports to estimate consumer willingness to pay for (or valuations of) the allegedly infringing features at issue in this case by evaluating responses to a survey of 455 Samsung smartphone users and 415 Samsung tablet users. He uses an approach known as "conjoint analysis,"[3] which estimates the value that individual consumers place on product features by asking them to "choose" between hypothetical products (four in this case) that vary simultaneously across multiple features (organized in seven groups in this case), including price. This choice exercise was repeated 16 times for each individual respondent, and the value of each product feature was estimated from these responses using a form of Bayesian analysis referred to as Hierarchical Bayes.

15. There are different conjoint analysis methodologies. The particular approach used by Professor Hauser is referred to as Choice Based Conjoint, and is offered in survey software commonly referred to as "CBC" developed by Sawtooth Software, Inc. of Orem, Utah. Additionally, Professor Hauser uses another Sawtooth software application called CBC/HB to

[3] From "consider jointly."

estimate the part-worth utilities for each respondent. A part-worth is when multiple attributes come together to describe the total worth of a product or concept, the utility values for the separate parts of the product (assigned to the multiple attributes).

16. The survey participants in Professor Hauser's study were selected by Research Now, a market research firm that maintains a standing panel of over 3.6 million U.S. consumers. From this pool, Research Now invited 38,795 individuals to participate in the smartphone survey, and 94,932 individuals to participate in the tablet computer survey (Hauser Exhibit J). Of these, 8,844 smartphone survey invitees, and 22,606 tablet survey invitees, elected to participate. Professor Hauser eliminated survey respondents who did not meet additional screening criteria, which included, among other things, not having purchased an allegedly infringing Samsung smartphone or tablet in the past two years. This left 604 and 599 individuals that completed the surveys respectively.[4] Note only 1.6% of the smartphone and 0.6% tablet owners invited participants completed a survey. From the raw sample of 604 and 599 completed surveys, Professor Hauser eliminated respondents who were among the 10% fastest and the 10% slowest of all respondents in terms of the time taken to complete the survey; respondents that gave the same response to every question; and respondents who owned more than five devices. This set of restrictions limited the final dataset to 455 smartphone users and 415 tablet users.[5]

B. The Apple Utility Patents At Issue

[4] Respondents were also eliminated if they took the survey on a smartphone or tablet, failed to answer questions about their age or gender, worked in the consumer electronics marketing, public relations or advertising industries, didn't know the price or model of their most recent Samsung phone or tablet, or were not involved in the decision to select the product.

[5] Hauser Report ¶ 76.

17. It is my understanding that, in this suit, Samsung is accused of infringing the following Apple utility patents:

U.S. Patent No. 6,493,002

18. The ‘002 patent is directed to a “control strip” or “control window” “implemented in a window layer that appears on top of application programming windows that may be generated.” According to Apple's expert, this patent covers the “quick panel” or “notification panel” that slides down from the top by swiping downward.

U.S. Patent No. 7,469,381

19. The ‘381 covers the “bounce back” feature that indicates to the user when he or she has reached the edge of an electronic document when translating the document on a touch screen display. According to the claimed method in the ‘381 patent, when a user translates an electronic document beyond the edge, an area beyond the edge of the electronic document is displayed and when the user removes his or her finger from the display, the document “bounces back” so that the area beyond the edge of the document is no longer displayed.

U.S. Patent No. 7,663,607

20. The ‘607 patent is a touchscreen hardware patent and covers a two-layer transparent touchscreen capable of detecting multi-touch. The patent claims cover a specific arrangement of transparent conductive lines/electrodes on two separate layers that are electrically isolated from each another.

U.S. Patent No. 7,920,129

21. The ‘129 patent claims the basic ‘607 two-layer electrode structure but specifies that the bottom traces (i.e., traces further from the user and closer to the LCD) should be

substantially wider than the top electrodes (i.e., electrodes closer to the user) to provide shielding for the thinner top electrodes.

U.S. Patent No. 7,812,828

22. The '828 patent describes a method for generating a proximity image from a network of touch sensitive sensors, segmenting the touch from the background or segmenting multiple touches from one another, mathematically fitting an ellipse to represent a finger or other body part to each touch, and recording a group of parameters for each ellipse fit to a touch. The patent also describes a method for tracking the movement of a touch by tracking the changes in the ellipse parameters over time.

U.S. Patent No. 7,844,915

23. The '915 patent covers the single finger swipe gesture to scroll and a two or more finger gesture to scale, as well as "rubberbanding," the snapping back of the scrolling region after the edge is exceeded.

U.S. Patent No. 7,853,891

24. The '891 patent covers windows that appear on user input and disappear automatically. Apple targets the volume window that appears when the volume on a Samsung accused device is changed. One type of claim in the patent is limited only to windows that do not close in response to user input. Another type of claim describes windows that may close in response to user input as well as automatically, but the windows must be translucent. Both types have a limitation that the window must appear at location independent of a cursor.

U.S. Patent No. 7,864,163

25. Apple's '163 patent describes a method for viewing and navigating a "structured electronic document" (*e.g.*, a web page) on handheld, small-screen devices. For example, in

response to a first tap on a "box" of content, the user is provided an enlarged and centered view of the first "box" ("tap-to-zoom" gesture). While viewing the first, enlarged box, a user can then make a "second gesture" on a second "box" of content and the view will re-center on the second "box" ("tap-to-pan").

V. Criticisms of Professor Hauser's Surveys

A. Professor Hauser's Surveys Do Not Accurately Describe The Allegedly Patented Features.

26. Professor Hauser's surveys do not accurately present the features allegedly covered by the Apple utility patents at issue to respondents in the surveys he conducted. These inaccuracies are individually described below:

'915 Patent

27. Professor. Hauser's report explains that, "In order to obtain reliable data from a conjoint exercise, it is important to have clear descriptions of the features and levels." (Hauser Report, para 63) The report includes several videos showing "touchscreen capability levels (for both smartphones and tablets) . . . chosen such that they would represent a product that included a non-infringing alternative for one or more of the patents at issue." (*Id.*) Specifically, Professor Hauser says:

> "The touchscreen capability levels in the smartphone survey were chosen to capture the following Patents: (i) '828, (ii) '915, and (iii) combination of '915, '381, and '163. The touchscreen capability levels in the tablet survey were chosen to capture the following Patents: (i) '607, (ii) '915, and (iii) combination of '915, '381, and '163." (Hauser Report, fn 42)

28. Professor Hauser does not attempt to explain the functionality claimed by the '915 patent, saying only that, "The specific technical descriptions of the touchscreen capability levels

and information about their functionality were provided to me by counsel. I have not reviewed or interpreted the patent claims myself and do not have a professional opinion on that matter." (Hauser Report, pp 32, para 63)

29. According to Professor Hauser, the second video demonstrations in both the phone and tablet surveys are specifically intended to capture solely the '915 patent. The Phone Touchscreen B.swf demonstrative (http://www.surveyplus.com/ survey1202 asps/play_video.asp?vid=32) includes a mode that "doesn't always reliably detect intent of contact with touchscreen." Somewhat similarly, the Tablet Touchscreen B.swf demonstrative (http://www.surveyplus.com/survey1202asts/play_video.asp?vid=32) "works in a single-touch mode," with "very limited multi-touch capability," and some multi-touch gestures "like pinch to zoom, will work, but with poor response."

30. However, a mobile phone or tablet computer with a touchscreen that works occasionally, but unreliably, is not, as I understand it, claimed by the '915 patent. Moreover, I understand that Samsung's accused devices do not work this way. For that matter, I also understand that even Apple's phones and tablets do not exhibit the aberrant behavior shown in these videos. An unreliable touchscreen would presumably not represent a non-infringing alternative to the '915 patent, as Apple would presumably claim it still infringed when the device responded properly to the user's touch input. Accordingly, Professor. Hauser's opinions on the value of the '915 patent, which are derived from the survey participants' responses to these video demonstrations, are invalid because a control, a non-infringing alternative, is not presented.

'163 Patent

31. In his survey of Touchscreen features, Professor Hauser presented four choices from which the respondent could choose. These four choices represent only four of the sixteen possible combinations for the four specific features that are listed:

(a) Multi-touch capability;[6]

(b) Automatically switch between single- and multi-touch;

(c) Rubberband effect; and

(d) Tap to re-center after zoom.

32. Because the "Rubberband effect" and the "tap to re-center" features are never shown independently, it is not possible to isolate the specific feature's effect on a respondent's choice of the combination of features.

33. Furthermore, with respect to the '163 patent, the most relevant feature in the survey is called "Tap to re-center after zoom." However, the descriptions and video presented to respondents are too vague to isolate which feature(s) is being described in the survey. The "Detailed Description" refers to permitting tapping "the screen to center other content on the screen" "after zooming in and centering."(Hauser Exhibit D, pp 111) It is unclear whether the survey taker is interested in the zooming in and centering, or the subsequent tap to re-center after zoom. Indeed, in both the explanations in Professor Hauser's report and in his video, the feature is always described in conjunction with the zooming in and centering. As conceded by Professor Hauser, zooming in and centering alone is not accused. (Hauser Exhibit E, pp 127)

34. Second, the surveys do not clearly demonstrate the functionality that occurs before the tap to "center other content on the screen." Both the "Detailed Description" and the text in the video just refer to zooming. There are many ways to zoom that do not involve double-

[6] In the smartphone survey the "multi-touch capability" feature is replaced by the option for "Reliably and Accurately Tracks Finger Movements." See Hauser Exhibit D, p. 9.

tapping. The fact that the video itself describes double-tapping to zoom does not necessarily clarify the functionality that occurs before the tap to "center other content on the screen."

35. Third, none of the survey examples involves the entirety of the claimed functionality. The claimed functionality is not just re-centering content, after a zoom, but also double-tapping to zoom. Without either of these functionalities, it is my understanding there can be no infringement.

36. Fourth, the "tap to center other content after zooming" functionality is never accurately tested. In the four video examples, the tap to center functionality is never tested on its own. For example, the tap to center other content after zooming is only excluded in the phone-touchscreen-d.png demonstrative (http://www.surveyplus.com/survey1202asps/play_video.asp?vid=34). However, this video also excludes the "rubberbanding" feature. The "rubberbanding" feature is never excluded in any other case. Therefore, the survey provides no evidence as to whether (a) respondents desired the "tap to center other content after zooming"; (b) respondents desired the rubberbanding functionality; or (c) respondents desired all of this functionality together. In fact, the surveys provide no reliable data for the '163 patent.

37. This is further illustrated by the fact that Professor Hauser does not provide any purported value for the '163 patent individually. Instead, he conflates the '163 patent with other patents and proposes alleged values that apply to all of those patents combined.

'381 Patent

38. In his survey of Touchscreen features, Professor Hauser presented four choices from which the respondent could choose. These four choices represent only four of the sixteen possible combinations for the four specific features that are listed:

(a) Multi-touch capability;[7]

(b) Automatically switch between single- and multi-touch;

(c) Rubberband effect; and

(d) Tap to re-center after zoom

Because the "Rubberband" effect: and the "tap to re-enter" feature are never shown independently, it is not possible to isolate the specific feature's effect on a respondent's choice of a combination of features.

39. Of the four choices described above that Professor Hauser presented in his survey of Touchscreen features, I understand the feature most relevant to the '381 patent is called "Rubberband effect." But, as with the '163 patent, the descriptions and video presented to respondents are too vague to isolate which feature(s) is being described in the survey. The "Detailed Description" refers to "Rubberbands at Edge of Webpages or Images," but the linked video shows only a Webpage. The survey taker is not shown what "Rubberband effect" means with respect to images. What is more, the webpage that is shown in the video moves only in the vertical direction; it is not clear to the survey taker whether "Rubberband effect" is limited to this use case. Apple's infringement allegations against the Gallery application, for example, requires the user to zoom in first, before translating an electronic document to the edge. The image in Gallery can be translated in an arbitrary 2-D direction. Lastly, the term "rubberband" is not used in the '381 patent – it is not clear if this effect is intended to refer to the accused functionality of the '381 patent or refers to the functionality of the '915 patent.

40. As previously stated, with the flawed IDIs and pretests as well as the complexity of the attributes and further misrepresentation by Professor Hauser, the choices presented in the

[7] In the smartphone survey the "multi-touch capability" feature is replaced by the option for "Reliably and Accurately Tracks Finger Movements."

CBC exercise may not have been clearly understood by the respondents or representative of the current market thus rendering Professor Hauser's results unreliable.

'828, '129, and '607 Patents

41. Professor Hauser's surveys do not test any feature described by the '828, '129, or '607 patents. Professor Hauser appears to assume – based solely on information provided by Apple's counsel – that, because of the allegedly patented technology, touchscreens utilizing the allegedly patented technology function better than touchscreens that do not utilize the allegedly patented technology. However, Professor Hauser never makes this statement explicitly and fails to present any evidence demonstrating that the allegedly patented technology improves touchscreen response time or accuracy. With inaccurate features tested, the results of the survey do not represent the true potential features.

B. Professor Hauser's Report Does Not Provide Details Of The In-Depth Interviews, Or Whether There Was A Clear Understanding Of The Different Features.

42. Professor Hauser's report (sections 35 through 40) does not provide the details of the in-depth interviews (IDIs) reportedly conducted with 20 Samsung smartphone or tablet owners. Thus, the following is not clear:

- Methodology: Professor Hauser states that he "instructed AMS to conduct in-depth interviews with current Samsung smartphone and tablet owners." (Hauser Report, p 20, Item 35). He does not, however, provide the methodology under which these interviews were conducted – e.g., by telephone at a central location, and/or individual or in a group setting. Without clear documentation of Professor Hauser's methodology and without sufficient documentation of the results of the interviews, it is not possible to fully understand (and potentially replicate) his methodology. Moreover, given these deficiencies, I am unable to ascertain

potential bias in the moderation or interview setting that might pollute his analysis and results. These fundamental issues raise substantial concerns about the reliability of Professor Hauser's subsequent analysis and results.

- Demographics: Professor Hauser does not indicate if the interview pool was selectively pulled and representative in demographics, nor does he provide the demographic information of those reportedly interviewed. Given this lack of data, one cannot determine the reliability of information provided by these respondents or the accuracy of the smartphone features identified from these IDIs. These foundational issues also raise substantial concerns about the reliability of Professor Hauser's analysis and results.

- Level of personal experience with smartphones and/or tablets: There is likely a greater degree of sophistication in understanding features among dual device users vs. single device users where the level of understanding of the features is not representative of the market.

- Features tested: It is also not clear which features, among the myriad smartphone and tablet features (*e.g.*, replaceable battery, expandable storage, print/fax functionality, speech to text, voice activated dialing, start-up time, device brand, keyboard type, wireless carrier, etc.) were included in the test and identified in the IDIs as relevant.

43. Professor Hauser explains that no records exist for these interviews as, ostensibly per his practice, all "interviews were verbal in nature and were not recorded or transcribed" and he "was briefed by AMS" about the results (Hauser Report, Sections V though VI). It thus

appears that Professor Hauser unilaterally selected seven features to test, thus creating a forced choice survey that artificially emphasized the tested features. For example, if Professor Hauser had shown more features identified by consumers as influential to their purchasing decision, any one of the tested features may have been drowned out by a feature real-world consumers actually consider when purchasing smartphones and tablets. Professor Hauser's decision to not record any data from this initial group of 20 individuals renders his analysis and results unreliable.

44. Similar to the problems created by the lack of records of the IDIs, Professor Hauser's report (Section 42) does not provide the details of the pretests reportedly conducted with 20 Samsung smartphone or tablet owners before launching the online surveys. As with the IDIs, Professor Hauser provides very little information about the pretest interviews. Notably his report provides little or no information about the methodology employed, the demographic characteristics of the participants, and the features that were tested. Based on Professor Hauser's Exhibit H, it appears that the sample of 20 included people who owned both smartphones and tablets. Relying in part on the input of dual device owners, however, may bias the results, since what is of importance to a single device owner may not be of importance to a dual device owner. As with the IDIs, Professor Hauser does not provide any information on methodology or demographics related to the pre-tests. It is unclear if demographics were appropriately represented in this pretest, if the pretest respondent pool was the same set as used in the IDIs, or a different set of respondents was used.

45. Professor Hauser also indicates (Section 45) that pretesting continued until respondents were able to answered the questions easily, and did not find the questions difficult or ambiguous. Here again, Professor Hauser fails to provide any documentation or iterations of the survey instrument as it was in the pretest stages. When conducting pretests, it is very important

to understand what questions were asked to gauge the intelligibility of the features and how the respondents reacted to the descriptions.

46. Exhibit H of Professor Hauser's report shows that respondents experienced intelligibility problems at every stage during the pretests. Notably, the problems related to the touchscreen feature clearly indicated a need for continued testing in addition to Professor Hauser's 20 poorly described pre-tests. Furthermore, it is not clear how the results of the pre-tests led to the subsequent changes and, more importantly, whether the "solutions" Professor Hauser devised were tested again to ensure that the features were completely understandable. When unclear questions are included in a survey, serious problems can arise:

> When unclear questions are included in a survey, they may threaten the validity of the survey by systematically distorting responses if respondents are misled in a particular direction, or by inflating random error if respondents guess because they do not understand the question.[8]

47. Many features and their levels presented in Professor Hauser's CBC (Choice Based Conjoint) exercise were complex and contained combinations of attributes. For example, when asked to consider the camera, a respondent was asked to consider whether it was front facing or rear facing, or both, whether it had autofocus, whether it had zoom, and whether video recording was standard definition or high definition. As another example, connectivity was identified to include various discrete features like WiFi, Bluetooth, Micro USB, HDMI, which are not mutually exclusive or collectively exhaustive. With so many attributes presented, the respondent is no longer making a choice by trading off seven features, but has choices with 19 features. Such a large number of features will lead to consumer confusion due to information

[8] Floyd J. Fowler, Jr., How Unclear Terms Affect Survey Data, 56 Pub. Opinion Q. 218, pp 225–26.

overload and cause the CBC exercise to be unreliable. If a respondent's information processing systems become overloaded during performance of conjoint tasks, the benefits of having the respondent complete a realistic task like CBC will be offset by the overly demanding task. This phenomenon is well known and has been studied quite extensively by a number of researchers.[9]

48. Additionally, a review of 4 choices makes it for an even more complex choice each respondent must make. In fact, Sawtooth Software, Inc. recommends using a different method of conjoint analysis called "Adaptive Choice-Based Conjoint" or "ACBC" for circumstances such as this, in which more than five attributes are tested and when conjoint sections of the survey last 7 to 15 minutes within the questionnaire. (See http://www.sawtoothsoftware.com/products/acbc/)

> *"..Adaptive Choice-Based Conjoint (ACBC) is our most advanced system for conjoint/choice analysis. It is used for studying how people make decisions regarding complex products or services. ACBC is a new approach to preference modeling that leverages the best aspects of CBC (Choice-Based Conjoint) and ACA (Adaptive Conjoint Analysis). An Adaptive Choice interview is an interactive experience, customized to the preferences and opinions of each individual."*

49. With the 19 attributes described in the CBC exercise that Professor Hauser uses, it is clear that a technique like ACBC would have been more reliable and the features better understood by respondents. As a result, the CBC exercise used produced results that are unreliable.

[9] "Information Overload in Conjoint Experiments", Lines, Rune, and Jon M. Denstadt, International Journal of Market Research, Volume 46, Q3, September 22, 2004, at 97-310.

50. Furthermore, by providing videos for some features and only graphics for others (Hauser Report, ¶ 64) the survey may have created demand artifacts that would place more emphasis on the attributes for which videos were shown. Consequently, the willingness-to-pay for these attributes would be biased upward as compared to attributes for which only an image was shown.

51. It is my opinion that the IDIs and pretest interviews were not conducted with sound procedures in place as outlined in the Reference Manual on Scientific Evidence, and are therefore fundamentally flawed and unreliable for at least the following reasons:

- Lack of properly defined population or universe.

- Inadequate sample size; it is clear that a sample size of 20 was not sufficient to ensure the survey and features were understandable to respondents as Professor Hauser's pretest data clearly shows respondents experienced intelligibility issues with many of the features as they were described, a sample size of a minimum of 25 to 75 is suggested for the pretest phase.[10]

- Lack of detailed written instructions; Professor Hauser provided only oral instructions (Hauser Report Sections V and VI) and 'did not provide interviewers with detailed written instructions on everything they are to say to respondents, any stimulus materials they are to use in the survey, and how they are to complete the interview form'.[11]

- Lack of documentation or recording 'verbatim the respondent's answers, to indicate explicitly whenever they repeat a question to the respondent, and to record any statements they make to or supplementary questions they ask the respondent'.[12]

[10] Diamond, Shari S. (2010), "Reference Guide on Survey Research," in Reference Manual on Scientific Evidence, Second Edition, Federal Judicial Center, at 248-249.

[11] Id. at 264.

[12] Id. at 264-265.

C. Professor Hauser's Surveys Do Not Ask Respondents If They Actually Use Any Of The Features

52. Professor Hauser's surveys are not complete in that to provide an objective value of use of a feature, the survey should ask whether the respondent had ever heard of or used the feature.[13] In Professor Hauser's surveys, it is not clear whether respondents have used every one of the alleged features (or for that matter if they are even aware of these features). For example, a respondent may indicate in a choice exercise that they would be likely to purchase a product with the alleged feature, but in reality may never use such feature. Professor Hauser's surveys do not ask respondents whether any of the described features are actually used by the respondents. When respondents have never used a particular feature, and especially if they have never even heard of a particular feature, it is likely that any survey answers they provide will not be reliable sources of information on the value those respondents place on that feature. Consequently, Professor Hauser's surveys cannot be used to estimate reliable and objective values of use of the allegedly infringing features.

D. The Sample Of Respondents Represented By Professor Hauser's Surveys Are Likely To Be Biased And Not Representative Of The Population Of Potential Samsung Customers.

53. Professor Hauser's sample design implies biased results. Professor Hauser has inappropriately restricted his analysis to focus only on a sample of recent Samsung purchasers, rather than on a more appropriate sample of all potential Samsung smartphone and tablet customers.

54. If the samples used by Professor Hauser differ from more appropriate samples in ways that are systematically correlated with the value that a respondent places on the features

[13] "Information Overload in Conjoint Experiments," Lines, Rune, and Jon M. Denstadt, *International Journal of Market Research*, Volume 46, Q3, September 22, 2004, at 297-310.

that Professor Hauser purported to test, then the estimated value of those features will be biased. For example, if a standing pool of online survey participants is more likely to be marginally employed, or place a low value on their time, survey respondents may place disproportionately *low* values on time-saving features relative to others. Conversely, because surveys are conducted online via computer, the eligible pool of survey participants may be wealthier or older or younger than the average U.S. consumer, and thus are likely to place a disproportionately *high* value of the features surveyed.

55. Professor Hauser has failed to provide any data or analysis of how the characteristics of Research Now's standing Internet panel compare to the U.S. adult population or to the population of potential Samsung smartphone and tablet buyers. He provides no explanation for how the 38,795 smartphone survey invitees and 94,932 tablet survey invitees were selected, and has not provided any analysis of the characteristics of those individuals. His report merely notes that "potential respondents were identified through Research Now," and that "Research Now was able to target survey invitations to people who had indicated that they own smartphones or tablets."[14] Without such information, the representativeness of the standing pool of survey participants and the group of smartphone and tablet users invited to participate in the surveys cannot be adequately assessed. This also implies that his analyses and results cannot be fully understood and replicated and that the resulting opinions Professor Hauser presents are not reliable.

56. There is, however, concrete evidence which suggests that the Internet panel used in Professor Hauser's surveys does not adequately represent the U.S. population. It is well

[14] Hauser Report, pp. 25-26.

known that Internet panels may be very different from the general population, as acknowledged by a Research Now Vice President:

> We definitely recognize [problems relating to sampling and representivity in online panel-based research]because when we're looking at an online population, there's a bias from the recruitment methodology all the way down to technology issues, bandwidth issues, things like that. We try to educate clients on the biases that could exist within the sample population. People are looking at insight, and a lot of times representivity online is not achievable, but you can get a good predictive sample that will represent some of the leading thoughts within a particular sector. So we're doing a lot of target sampling and making sure that we're addressing some of the things that clients are coming up against.[15]

In other words, Research Now does not even make the claim that it can offer a reliably representative sample of any particular segment of the population.

57. Professor Hauser also provides no comparison of the characteristics of those invited to participate in the surveys with those who actually responded to the surveys. The potential for 'self-selection' bias arising from survey designs in which selected respondents can easily refuse to participate is a well-known danger of mail and Internet surveys.[16] Individuals who choose to respond to surveys may be systematically different from those originally invited to participate. Professor Hauser has not provided sufficient information in his report to assess the extent of such bias in his analysis and results. Again, this means that his analyses and results cannot be fully understood and replicated, and that his opinions are unreliable.

58. In Tables 1, 2 and 3 below, I compare the demographic characteristics of the respondents included in Professor Hauser's final sample of 455 smartphone users, with (a) the characteristics of his raw sample, (b) the characteristics of Android smartphone users and

[15] Terry Sweeney, see http://www.research-live.com/magazine/online-unplugged/4002500.article.

[16] See Alreck and Settle, The Survey Research Handbook: Guidelines and Strategies for Conducting a Survey, Second Edition, McGraw Hill, pp 81-82.

smartphone users more generally, as reported in a smartphone market study conducted by Apple,[17] and (c) characteristics of the U.S. population.

59. Table 1 considers the gender and age profiles associated with Professor Hauser's final and raw samples, relative to the demographics of Android phone users and smartphone users, as reported in market research conducted by Apple, and also relative to the broader characteristics of the US population over the age of 15.

Table 1
Demographic Characteristics of Survey Participants and Smartphone Users

Characteristics	Survey Sample Final	Survey Sample Raw	Android Users Apple Study	Smartphone Users Apple Study	US Population
	[A]	*[A]*	*[C]*	*[D]*	*[E]*
Age Range					
15-17	2.86% [1]	5.46% [1]	1.00% [2]	8.00% [2]	5.23%
18-24	11.43%	12.09%	19.00%		12.39%
25-34	20.00%	21.03%	22.00%	28.00%	16.59%
35-44	20.00%	20.36%	17.00%	29.00%	16.59%
45-54	21.76%	20.20%	18.00%	17.00%	18.18%
55+	23.96%	20.86%	23.00%	18.00%	31.01%
Sex					
Female	46.15% [1]	45.03% [1]	58.00% [2]	46.00%	51.32%
Male	53.85%	54.97%	42.00%	54.00%	48.68%

Sources and Notes:

[1] Indicates sample is statistically significantly different from the population frequencies at a 95% confidence level.

[2] Indicates sample is statistically significantly different from the scrubbed survey frequencies at a 95% confidence level.

[A] Hauser survey data. The final sample includes 455 respondents. The raw sample includes 604 respondents.

[C] Smartphone Market Study US. Apple Market Research & Analysis. January 2011. APLNDC-Y0000028850.pdf, at APLNDC-Y0000028937

[D] This source provides data for the age range of 16 to 24. *Portable Device Omnibus Study*. Apple Market Research & Analysis. April - May, 2010. APLNDC-Y0000024799 - APLNDC-Y0000024848 at APLNDC-Y0000024832.

[E] Reflects the fraction of the U.S. population 15 years or older which falls into each age range or gender category. Source: Single Years of Age and Sex: 2010, 2010 Census Summary File 1. U.S. Census Bureau. (http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_QTP2&prodType=table).

60. As shown above, statistically significant differences exist between the age and gender distributions for both of Professor Hauser's sample distributions, and the US population.

[17] Because all allegedly infringing Samsung products run on the Android operating system, Android user characteristics are being used as a proxy for Samsung user characteristics.

The age distribution found in Professor Hauser's final sample is also different from the distributions found in the Apple surveys of smartphone users and Android users. Professor Hauser's analysis includes statistically significantly fewer females than the portion of female Android users reported in Apple's marketing research. Because Professor Hauser's samples are not representative of the population of potential Samsung buyers, his analysis is likely to generate biased willingness to pay estimates and could cause those estimates to be overstated.

61. Table 2, below, considers the fraction of survey participants located in the 10 largest U.S. states, and compares these fractions to the distribution of the overall U.S. population. Professor Hauser's survey appears to over-sample respondents in the state of Illinois relative to population densities in the United States. Such skewed representation is likely to result in a biased willingness to pay.

Table 2

Geographical Distribution of Smartphone Survey Participants - 10 Largest States

State	Survey Sample Final	Survey Sample Raw	US Population
	[A]	*[B]*	*[C]*
CA	11.65%	10.76%	12.04%
TX	6.81%	8.28%	8.07%
NY	5.93%	6.13%	6.37%
FL	5.93%	6.46%	6.04%
IL	6.59%	6.46%	4.21%
PA	3.96%	4.30%	4.11%
OH	3.52%	3.48%	3.76%
MI	3.08%	3.97%	3.25%
GA	2.86%	3.15%	3.20%
NC	2.86%	2.32%	3.06%

Sources and Notes:

[A], [B] Hauser survey data. The final sample includes 455 respondents. The raw sample includes 604 respondents.

[C] Resident Population - States. U.S. Census Bureau. (http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=3&ved=0CCcQFjAC&url=http%3A%2F%2Fwww.census.gov%2Fcompendia%2Fstatab%2F2012%2Ftables%2F12s0013.xls&ei=RLCET8TQDYnZiQK60PH1BA&usg=AFQjCNFqsORFZPX9xmi8XR

62. If Professor Hauser succeeded in capturing a representative sample of the users of allegedly infringing Samsung products, the fraction of the total sample (for both the final and raw versions) that uses each model should approximately match the fraction of total purchases of that model relative to the total sales of allegedly infringing smartphones over the past two years. Table 3 performs this comparison.

Table 3

Distribution of Smartphone Models Surveyed vs. Sold

State	Survey Sample Final	Survey Sample Raw	Phones Sold (US) 2010 & 2011
	[A]	*[A]*	*[B]*
Acclaim	1.10% [1]	1.04% [1]	1.43%
Captivate	11.29%	10.58%	8.27%
Continuum	1.93%	1.66%	1.91%
Droid Charge	5.79%	6.22%	4.16%
Epic 4G	7.71%	6.64%	10.68%
Exhibit 4G	0.55%	0.62%	1.68%
Fascinate	9.37%	8.71%	8.53%
Galaxy Prevail	2.75%	2.28%	9.14%
Galaxy S 4G	15.43%	16.60%	6.81%
Galaxy S II	15.15%	15.35%	4.85%
Galaxy S Showcase	1.65%	1.66%	1.58%
Gem	0.55%	0.41%	2.22%
Gravity Smart	1.10%	1.45%	2.82%
Infuse 4G	4.96%	5.39%	5.06%
Intercept	4.41%	4.98%	7.36%
Mesmerize	3.03%	2.49%	3.91%
Nexus S	3.03%	2.90%	0.80%
Nexus S 4G	1.38%	2.28%	3.00%
Replenish	0.28%	0.62%	3.59%
Sidekick	2.48%	2.28%	2.55%
Transform	3.86%	3.53%	3.59%
Vibrant	2.20%	2.28%	6.07%

Sources and Notes:

[1] Indicates frequencies are statistically significantly different from population frequencies at a 95% confidence level.

[A] Hauser survey data. The final sample includes 455 respondents. The raw sample includes 604 respondents. The set of models under consideration is limited to those phones which appear in both the survey and the total sales dataset. Proportions have been grossed up to 100% to account for models not considered in this analysis.

[B] Musika Exhibit 37.1. The set of models under consideration is limited to those phones which appear in both the survey and the total sales dataset. Proportions have been grossed up to 100% to account for models not considered in this analysis.

63. As shown above, the prevalence of each allegedly infringing Samsung model captured in Professor Hauser's raw and final survey samples deviates significantly from overall sales patterns of allegedly infringing sales estimated by Apple's damages expert, Mr. Musika. For example, the Epic 4G, Galaxy Prevail, Gem, Intercept, Replenish and Vibrant phones are significantly under-sampled relative to total phone sales in 2010 and 2011. Likewise, the Captivate, Galaxy S 4G, Galaxy S II, and Nexus S are significantly over-sampled. The two most over-sampled phones, the Galaxy S II and the Galaxy S 4G had average sample prices that were $8 and $36 above the average reported price ($152) of the phones considered in Professor Hauser's final sample.[18] A systematic oversampling of the owners of high priced phones will bias Professor Hauser's willingness to pay estimates because such owners are likely to be less price sensitive than the general population of potential Samsung consumers.

64. Because the samples of respondents in Professor Hauser's surveys are biased and not representative of the population of potential Samsung customers, the willingness-to-pay estimates he presents are not reliable and will be higher than for actual representative samples of potential Samsung smartphone and tablet customers.

E. Professor Hauser's Analysis Fails To Control For Other Relevant Demographic Characteristics.

65. Professor Hauser's survey also fails to consider a variety of demographic characteristics that have been identified by Apple as relevant to marketing to potential smartphone and tablet buyers. For example, Apple's "Smartphone Market Study US" dated

[18] Based on the data provided by Professor Hauser, the average purchase price reported in his final survey sample was $152.08. The average reported purchase price for the Galaxy S II was $187.69. The average reported purchase price for the Galaxy S 4G was $160.02.

January 2011 and multiple "Apple Owner Survey's" collect and consider data on employment status and annual household income.[19]

66. Third parties have also identified demographic characteristics like income, ethnicity, education and employment status which play a role in smartphone and tablet selection.[20] Professor Hauser's analysis completely fails to control for these important characteristics. Without further information on Professor Hauser's sample, it is not possible to assess the extent of the bias created by his failure to control for demographic characteristics. His failure to collect adequate data on demographic characteristics, however, renders his overall analyses and results unreliable.

67. To the extent that these factors exert an independent influence on the demand for allegedly infringing features and are also correlated with the price paid for a smartphone (or a tablet), failing to control for these characteristics will bias the estimates of consumers' willingness to pay for the allegedly infringing features. For example, high-end phones may be more adept at handling corporate email and attachments and may also be more likely to incorporate multi-touch features. If information on employment status and income is omitted and the sample used by Professor Hauser is not in fact representative, demand for corporate email and adeptness with attachments may falsely be attributed to multi-touch capabilities.

68. If Professor Hauser had captured information on income, education level, ethnicity, and marital status among respondents who had been contacted (prior to being screened for their use of Samsung products), such data (along with information on the model of Samsung

[19] See, e.g., APLNDC-Y0000028850 - APLNDC-Y0000028945, at APLNDC-Y0000028938 and APLNDC-Y0000028939; APLNDC-Y0000025024 – APLNDC-Y0000025147 at APLNDC-Y0000025120; APLNDC-Y0000027423 - APLNDC-Y0000027505 at APLNDC-Y0000027488; APLNDC-Y0000023361 - APLNDC-Y0000023427 at APLNDC-Y0000023418.

[20] See, e.g., the PEW Research Center's Survey of American Smartphone Users dated July 11, 2011 available at: http://pewinternet.org/~/media//Files/Reports/2011/PIP_Smartphones.pdf.

phone) could have been helpful to ensure that the sample is actually representative of potential Samsung buyers (or even Android buyers). The data could be used to develop weights to ensure that the final sample of respondents who completed the smartphone and tablet surveys are a closer representation of potential Samsung buyers.

69. It is customary to weight sample data to ensure that important scores such as the customer's willingness-to-pay are a true representation of the marketplace. In my opinion not asking the complete list of demographic questions makes the results of Professor Hauser's surveys biased and unreliable.

F. Professor Hauser's Calculation Of Willingness-To-Pay Produces Results That Are Questionable.

70. Professor Hauser uses a simulation approach of part-worths (Hauser Report ¶ 51). Specifically, he states:

> The market simulation for a patent of interest considers a scenario with two alternative product options: one option does not have the feature level associated with the patent while the second option has the feature level associated with the patent. All other features of the two products are held at the same levels (e.g., camera, memory, size and weight). The market simulation uses the HB CBC partworth estimates to predict the number of respondents who would choose each of the two products when the second product (the one with the patent-related features) is offered at a higher price than the first product (the one without the features). The simulation adjusts the price of the second product until the price reaches the level under which the model predicts that the market is indifferent between the two products, i.e., 50% of the respondents will choose each of the two products.

71. The simulation approach only uses two products in the set. However, as pointed out by Ofek and Srinivasan (2002), "the introduction of additional alternatives can change the Market's Value of Attribute Importance values of existing products."[21] As a result, the use of only two products in the simulation leads to an upward bias in the WTP calculations of Professor

[21] Ofek, Elie, and V. Srinivasan, *Management Science*, Vol. 21, No. 4, Fall 2002, pp. 398-411.

Hauser. As discussed in detail below, using Professor Hauser's approach to calculate the WTP results in large numbers of very low and even negative values and substantial numbers of implausibly high values.

72. Professor Hauser's simulation approach, which he uses to measure an individual's willingness to pay, can be described as follows: a particular individual's willingness-to-pay for a particular feature can be measured by the amount (in dollars) required to make the respondent indifferent to a product with and without the feature. In other words, if the respondent pays more for the feature than this computed willingness-to-pay, he is worse off with it than without it. Similarly, if he pays less, then he is better off with it than without it.

73. However, Professor Hauser's survey results (even assuming all of the maintained assumptions hold) yield some very strange results, which indicate that his methodology is not reliable. For example, Professor Hauser reports that about half of the respondents have a willingness to pay for features associated with the `915 patent of more than $39 and about half had less.[22] However, Professor Hauser's model implies willingness-to-pay estimates for this smartphone feature for many respondents that are far outside any reasonable bounds:[23]

- Nearly 30 percent of respondents have an estimated willingness-to-pay that is negative, implying they would need to be paid to accept the feature on their smartphone;
- About 10 percent of respondents would need to be paid more than $100 to accept the feature;

[22] See Hauser Report ¶ 103 and fn 73.

[23] The figures below are from the willingness-to-pay distribution for the '915 patent. Professor Hauser reports the median value for this patent in his Table 4. The figures below are computed using the same data Professor Hauser used to perform his willingness-to-pay analysis, except with a slight modification of his SAS code which allowed me view the characteristics of his willingness-to-pay distribution. I also conducted the same analysis for the other median values reported in Professor Hauser's Table 4 and obtained similar results.

- More than 5 percent of respondents would need to be paid at least *half a million dollars* to accept the feature;
- The top five percent of respondents would be willing-to-pay more than about *five million dollars* to have this feature on their touch screen;
- The top ten percent of respondents would be willing-to-pay about *two million dollars* or more for this feature; and
- Almost 20 percent of all respondents would be willing-to-pay a *quarter million dollars* or more for the feature Professor Hauser claims is related to the '915 patent.[24]

74. While the previous list of illogical calculated values applies to Professor Hauser's calculations of the `915 patent, similarly bizarre results hold for the other "values" generated by Professor Hauser's model. Of course, these values, even if realistic, would not represent the value to Samsung because they only attempt to estimate the respondents' maximum willingness to pay for the estimated features. Professor Hauser's results are infirmed beyond repair and unreliable.

75. The recommended approach for computing a market's value for an attribute improvement is described by Ofek and Srinivasan (2002). This approach computes the market's value for an attribute improvement. This approach relies on viewing each patented feature as an improvement over not having the patented feature. Professor Hauser's approach assumes that all of the patented features are a single attribute and the levels of the attributes are defined in a manner that reflects the alleged patents. Additionally, since the market value for an improvement of an attribute change depends specifically on which Samsung product was

[24] The data used are found in the following files: "avss_mono_scrub.sas7bdat" and "avst_mono_scrub.sas7bdat" provided by Professor Hauser.

infringed upon, the method ensures that which competitive product is asking the question is taken in to account. The approach recognizes the importance of the competitive set when calculating the value for an attribute change.

G. Professor Hauser's Estimated Consumer Valuations Do Not Represent Value To Samsung

76. Assuming, arguendo, that Professor Hauser has accurately estimated consumer valuations of the allegedly infringing features, a variety of economic factors (e.g., competition among smartphone suppliers) would generally limit the ability of Samsung to capture that value (i.e., to gain economic benefits from the alleged infringement). I have been informed, however, that the value to Samsung is precisely what is relevant for determining a reasonable royalty (or the alleged infringer's profits) in this case. Any technique, such as the one Professor Hauser used here, that is focused on estimating consumer value rather than value to Samsung will therefore be, at best, of very limited value to the question of damages in this case.

77. Professor Hauser has sampled recent Samsung purchasers and produced estimates near the middle of a range of Samsung customer values for specific allegedly infringing features. However, these numbers have little or no bearing on the value (in profit terms) to Samsung of these specific features (except, possibly, as a very loose upper bound on the value to Samsung). And it is misleading, therefore, to suggest that these numbers may be an estimate of the value to Samsung by referring to them as the "price premium."[25]

78. It is easy to come up with simple examples where the value to Samsung of an added features is zero, while the value to some individual customers is positive. Profits to Samsung with and without the features depend on the profit maximizing prices of the two different phones – with and without the features. If Samsung were to consider pricing of a

[25] Hauser Report ¶ 50 and Table 4.

product with the features versus the pricing of a product without the features, the difference in the two profit maximizing prices would reflect incremental cost of producing the features plus the incremental profit from them. The profit maximizing price of the phone with the features would depend on the range of willingness to pay for the entire set of potential customers – not just those that have bought Samsung in the past (as Professor Hauser posits) or otherwise value Samsung highly.

79. As an example, suppose there are two attributes each with two levels of value in the population, Samsung brand name ($80 and $110) and presence of additional features ($0 and $20). This yields a total of four valuation pairs of attributes. Customer valuations are evenly distributed across these four valuation pairs so that 25% of consumers value the Samsung brand at $80 and the additional features at $0, 25% value the Samsung brand at $110 and the additional features at $0, etc. Assume production costs for a Samsung phone are $90 (and that it does not cost Samsung anything extra to add the features to the phone). Under these assumptions, the profit maximizing price of a Samsung phone without features is $110 and half the consumer population will choose to buy a Samsung phone.

80. The profit maximizing price of a Samsung phone with features could be higher. At a price of $130, half as many consumers will buy a Samsung phone, but the profit per person is twice the size, leaving overall Samsung total profits unchanged. Thus, the profit maximizing price could be higher but the profits are the same. In other words, Samsung is indifferent to selling the phones with the features or without the features, because in either case, the profits are identical.

81. In the example, as in general, the distribution of the value of features in the set of consumers need not have any bearing on the incremental profit or value to Samsung of offering

those features. Indeed, in this example, the value to Samsung of an added features is zero, while the value to some individual customers of the features is positive.

H. Professor Hauser's Analysis Fails To Control For Relevant Smartphone Characteristics.

82. Professor Hauser's conjoint analysis omitted a variety of characteristics that matter to consumers when selecting smartphones and tablet computers. For example, over 30% of recent Smartphone buyers surveyed by Apple in a recent market study identified the availability of GPS location and navigation services as important in their selection process.[26] Neither of these features, however, was included by Professor Hauser in his study. Other features that were omitted by Professor Hauser, such as a replaceable battery and battery life, may play a much more important role in determining a consumer's choice of smartphone than at least some of the features he did include in his survey. If demand for any of these omitted features is correlated with the presence of and demand for features that were included in Professor Hauser's choice sets, his estimated value of these correlated features is likely to be biased. For example, if consumers assume that phones that have large screens have poor battery life, the estimated willingness to pay for a large screen will be biased downward all else being equal. As another example, there is at least some evidence that the most important consideration for buyers of new Android smartphones is the desire to stay with their current carrier.[27] Because Professor Hauser has excluded important features from his analysis, his results bias and inflate the value of the features he does test. Related, in the tethering video, the voiceover mentions AT&T and Verizon by name. This may artificially drive the value of the tethering feature down and the value of other features up because people who are non-AT&T and non-Verizon

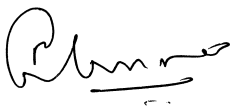
[26] See APLNDC-Y0000028850 - APLNDC-Y0000028945, at APLNDC-Y0000028876.

[27] APLNDC-Y0000028850 - APLNDC-Y0000028945, at APLNDC-Y0000028926 - APLNDC-Y0000028930.

customers might assume they would, in addition to paying a price premium for tethering, have to switch carriers to have that feature. Professor Hauser's study should have attempted to control for all relevant features. It is well-known that the failure to control for relevant features is problematic and leads to unreliable results. Professor Hauser's failure to do so renders his results and opinions biased and unreliable.

83. In summary, I have identified numerous flaws with the analysis reported by Professor Hauser. I believe that problems in any one of the three areas I have described: sample integrity, flawed implementation of the market research and incorrect implementation of the willingness to pay methodology, would render the results unreliable. The fact that there are problems with all of these lead me to conclude that the results of the survey and Professor Hauser's analysis lack both credibility and reliability.

84. I reserve the right to adjust or supplement my analysis in light of any critique of or comments on my report or alternative opinions advanced by or on behalf of Apple.



R. Sukumar, PhD April 16, 2012

EXHIBIT A

BIOGRAPHY OF R. SUKUMAR, PH.D.

R. Sukumar, Ph.D., President and Chief Executive Officer, Optimal Strategix Group, Inc.

Dr. Sukumar is President and founder of Optimal Strategix Group. He works with clients to provide strategic guidance and has assisted with developing research methodologies to solve their unique problems. He has spent over 25 years in academia and has worked with various global corporations over the course of his extensive career.

Dr. Sukumar taught Marketing Strategy and Marketing Research in MBA and Executive MBA programs at top U.S. academic institutions including Rutgers Business School, Thunderbird, Garvin School of International Management, the Smith School of Business at the University of Maryland, Bauer College of Business, University of Houston, Jones School of Management, Rice University and University of Georgia, Terry College of Business. In addition, he served as Associate Dean at the Indian School of Business.

During the span of his academic career, Dr. Sukumar has provided consulting services to companies in the Consumer Packaged Goods, Financial Services, Hospitality and Pharmaceutical industries. Throughout his career, he has worked with market research firms such as The NPD Group and IPSOS. In addition, he has co-founded two companies in the areas of software development and marketing consulting.

Dr. Sukumar completed his MBA and Ph.D. from the University of Pittsburgh in Marketing and Business Administration. He received his undergraduate degree in Mechanical Engineering from the Indian Institute of Technology in India.

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Education

1991 *Ph.D. in Business Administration*
Joseph M. Katz Graduate School of Business
University of Pittsburgh, Pittsburgh, Pennsylvania.
Major: Marketing (Stochastic Parameter Model to Understand Price and Promotion Effectiveness)

1990 *Master of Business Administration*
Joseph M. Katz Graduate School of Business
University of Pittsburgh, Pittsburgh, Pennsylvania.
Major: Marketing

1985 *Bachelor of Technology (Hons.)*
Indian Institute of Technology, Kharagpur, India
Major: Mechanical Engineering

Experience

1998- Chief Executive Officer, Optimal Strategix Group, Inc., a strategic market research and marketing consulting company focused on delivering market foresight on innovations, brand engineering, and effective marketing programs

Fall 2008 Visiting Professor, City University of New York, Baruch College

2006-2007 Visiting Associate Professor of Marketing, Rutgers Business School, State University of New Jersey, New Brunswick, NJ

2005-2006 Visiting Professor of Marketing, Robert H. Smith Graduate School of Business, University of Maryland, College Park, Maryland

2001-2005 Clinical Professor of World Business, Thunderbird,
Sam Garvin International School of Management, Glendale, Arizona
Courses taught – Data Analysis, Global Product Development, Analysis for Strategic Marketing, EMBA – Data Analysis in Taipei – Teacher Effectiveness Index from 4.3 to 4.8 on 5.0

Taught in the MBA and Executive MBA programs and Executive Education Programs. Rated the best professor in Marketing; top three in the Business School Associate Director – Thunderbird Corporate Consulting Program. Consulted with GM, Ford, J & J, among others.

1999-2001 Visiting Associate Professor of Marketing, Jones Graduate School of Management
Rice University
Taught in the MBA and the Executive MBA programs
Rated in the top three professors in the Business School

2002-03 Associate Dean for Academic Programs, The Indian School of Business
ISB is founded by partner schools Northwestern University, Kellogg Graduate School of Management; University of Pennsylvania, Wharton School of Management and London School of Business.

1990-99 Assistant Professor – Marketing & Entrepreneurship, C. T. Bauer College of Business, University of Houston.

Taught in undergraduate, graduate (MBA and Ph.D.) and Executive MBA programs
Received Distinguished EMBA Faculty Award, 1999.
Received Halliburton Excellence Award for Teaching and Service, 1996-97.

1997-2004 Vice President - Marketing Sciences, IPSOS-Insight, New York, NY (first started with the NPD Group, Inc., custom business was acquired in 2001 by IPSOS).
Role involves conducting advanced analytics, product development, conducting workshops, internal teaching, client support and research and development of new analytical tools.

Also taught at the City University of Hong Kong, Hong Kong courses on Global Product Development, Marketing Management, and Marketing Research

Teaching & Workshops

Core course in Marketing Management, Market Research and Marketing Strategy
MBA electives in Business-to-Business Marketing, Database Marketing,
Data Mining, and New Product Development

Executive MBA courses in Marketing Management and Advanced Marketing Strategy.

Taught in the Executive Certification Program in E-Commerce Management at the C. T. Bauer College of Business, University of Houston.

Conducted Workshop on Survey Research Methods at the Advanced Research Techniques Conference in Aspen, Colorado (June 1998).

Chaired two Executive workshops on "Improving the New Product Development Process: Lessons from Experts" (June 1994 and May 1995)

Chair of Executive Program on "Customer-Driven Technology New Product Development: Increasing Profits and Managing Risk through Market Research." (January 17-18, 1996)

Conducted three week course on "Managing Markets" for executives from Deutsche Telekom, Germany (October 1996)

Taught executives from Deutsche Telekom, Germany (June 1997, September 1997), from China's PetroChina (China National Petroleum Corporation) (September 1999, June 2000, September 2000).

Research Experience

Articles

"Heuristics for Product-Line Selection using Conjoint Analysis," Management Science, December 1990, Vol 36, Number 12, p. 1464-1478 (with Professor Rajeev Kohli).

"Measuring Marketing Mix Effects in the Video-Game Console Market" with Pradeep Chintagunta and Harikesh Nair (forthcoming Journal of Applied Econometrics, October 2006)

"Data Mining," in Handbook of Marketing Research, 2006 (editors, Rajiv Grover and Marco Vriens)

Research Interests

New Product (service) innovation, Market segmentation, brand loyalty, pricing, database marketing, data mining, market structure analyses.

Presented at several conferences and workshops. Most recent presentation: "Effects of Service Failure and Service Recovery on Customer Life Time Value," a joint MSI/Yale University Conference (December 2004)

Presented conference papers at Marketing Science Conferences (INFORMS). Currently, working in the area of Hierarchical Bayesian approaches to Market Segmentation based on information search criteria

Other Research Experience

Served as a Reviewer for a number of manuscripts submitted for publication to journals published by the American Marketing Association, INFORMS.
Reviewer for manuscripts submitted to Management Science, Journal of Marketing Research and Journal of Advertising.

Dissertation Committees

Ms. Charu Prakash (co-chair), Ms. V. Satya (co-chair)
Kiran Karande (member), John Gaskins (member), Rajagopal Echambadi (member), Rosalind Wyatt (member)
Rama Pakala (member, Mechanical Engineering, Master's thesis)
Shantanu Swadi (member, Mechanical Engineering, Master's thesis)

Consulting Experience

Consulted on Marketing and Market Research issues for a number of large and small organizations, including Pfizer, Genentech, AstraZeneca, Johnson and Johnson Pharmaceuticals, Abbott Laboratories, Nestle, Kraft Foods, ExxonMobil, Jiffy Lube/Pennzoil, Schlumberger-GeoQuest, Halliburton, Lucas Arts, Qwest Cyber.Solutions, Inc., Lubrizol, Shell Oil, Calgary Transit Authority, Diagnostic Systems Laboratories, Columbia/HCA, METRO Transit, Conoco and St. Luke's Episcopal Hospital.

I have worked with a number of organizations as part of class projects with student teams developing market research and marketing plans.

Conducted training programs for Reliant Energy and Communications, El Paso Energy, Deutsche Telekom, PetroChina (China National Petroleum Corporation), Shell Business Leadership Team.

Professional Affiliations

American Marketing Association, American Statistical Association, INFORMS
American Economic Association
American Psychometric Society
American Statistical Association
Product Development and Management Association
Past President, South Central Chapter of the Product Development and Management Association. (1995-1997)

Expert Testimony

Nomadix, Inc. v. Hewlett-Packard Company et. al, Civil Action No. CV09-08441 DDP (VBKs) For the United States District Court For the Central District of California, 2012

EXHIBIT B

Materials Relied Upon

Hauser Expert Report, dated March 22, 2012 and related
data, documents supplemental information produced by Professor Hauser:

Exhibits
A – Curriculum Vitae
B – Testimony in Last Four Years
C – Materials Reviewed
D – Smartphone Questionnaire
E – Tablet Questionnaire
F – Smartphone Questionnaire: Web Survey Screen Shots
G – Tablet Questionnaire: Web Survey Screen Shots
H – Findings from Pretests
I – Invitation to Respondents
J – Screening Statistics
K – Estimation Appendix

Data

Production Materials for Matlab, SAS, Stata and Survey Data
Production Materials Sawtooth Part 1 of 2
Production Materials Sawtooth Part 2 of 2

Materials Relied Upon

- Floyd J. Fowler, Jr., How Unclear Terms Affect Survey Data, 56 Pub. Opinion Q. 218, 225–26
- http://www.sawtoothsoftware.com/products/acbc/
- "Information Overload in Conjoint Experiments", Lines, Rune, and Jon M. Denstadt, International Journal of Market Research, Volume 46, Q3, September 22, 2004, , pp 297-310
- Diamond, Shari S. (2010), "Reference Guide on Survey Research," in Reference Manual on Scientific
- Evidence, Second Edition, Federal Judicial Center, pp. 248-249, 264-265
- Terry Sweeney, http://www.research-live.com/magazine/online-unplugged/4002500.article
- Alreck and Settle, The Survey Research Handbook: Guidelines and Strategies for Conducting a Survey, Second Edition, McGraw Hill.
- APLNDC-Y0000028850 - APLNDC-Y0000028945, at APLNDC-Y0000028938 and APLNDC-Y0000028939; APLNDC-Y0000025024 – APLNDC-Y0000025147 at APLNDC-Y0000025120; APLNDC-Y0000027423 - APLNDC-Y0000027505 at APLNDC-Y0000027488; APLNDC-Y0000023361 - APLNDC-Y0000023427 at APLNDC-Y0000023418.
- APLNDC-Y0000024799

- See for example, the PEW Research Center's Survey of American Smartphone Users dated July 11, 2011 available at: (http://pewinternet.org/~/media//Files/Reports/2011/PIP_Smartphones)
- Ofek, Elie, and V. Srinivasan, Management Science, Vol. 21, No. 4, Fall 2002, pp. 398-411
- Expert Report of Terry L. Musika, CPA
- "Single Years of Age and Sex: 2010," 2010 Census Summary File 1. U.S. Census Bureau. (http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_QTP2&prodType=table)
- "Resident Population - States." U.S. Census Bureau. (http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=3&ved=0CCcQFjAC&url=http%3A%2F%2Fwww.census.gov%2Fcompendia%2Fstatab%2F2012%2Ftables%2F12s0013.xls&ei=RLCET8TQDYnZiQK60PHBA&usg=AFQjCNFqsORFZPX9xmi8XRmTXQ5Wt7Kuog)