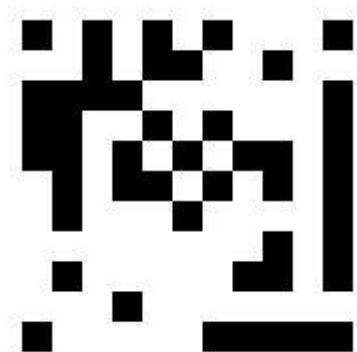


Improving Online Idea Generation Platforms and Customizing the Task Structure Based on Consumers' Domain Specific Knowledge

Web Appendix A1: Study 1 Interface (Idea Generation Task)

[The page was refreshed each time the respondent selected "submit idea." The task ended when the respondent selected "I have no more ideas."]

ScanWork is a new software that enables camera cell phones to read a type of special barcodes called EasyCodes. These EasyCodes direct the cell phone to perform specific actions. Below is an example of an EasyCode:



Easycodes can be printed on any type of paper, carton, or electronic screens. Using EasyCodes involves three steps illustrated below. These three steps only take a few seconds to complete.

STEP 1: Scan an EasyCode using your cell phone.

STEP 2: Your cell phone connects to a remote server via Internet.

STEP 3: Server returns information back to the cell phone.

➤ *[Condition 1: stimulus ideas, not decomposed:]*

Here are a few examples of possible applications of EasyCodes:

- A user could scan an EasyCode in a magazine and see a movie's trailer & showtimes.
- A user could scan an EasyCode on the back cover of a book that links to the book's Amazon page for purchase.
- Scanning an EasyCode on a business card could automatically save someone's contact information.
- Scanning an Easycode on a billboard could give the user additional information about the product or brand being promoted.
- Scanning an Easycode at the bottom of an email could automatically send, edit or save an appointment or date in the user's calendar.
- A user could scan an Easycode on a TV screen and download and play a game from a TV Show.

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY?

We are interested in new applications for the EasyCode technology. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

➤ [Condition 2: no stimulus ideas, not decomposed problem]:

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY?

We are interested in new applications for the EasyCode technology. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

➤ [Condition 3: stimulus ideas, decomposed problem]:

[The “paper” instructions below were shown first. These instructions were replaced with the “carton” instructions after the respondent selected “I have no more ideas using paper,” and the “carton” instructions were in turn replaced with the “screen” instructions after the respondent selected “I have no more ideas using carton.” The page was refreshed and the same instructions appeared each time the respondent selected “submit idea.”]

[Paper:]

Here are a few examples of possible applications of EasyCodes using **paper**:

- A user could scan an EasyCode in a magazine and see a movie's trailer & showtimes.
- A user could scan an EasyCode on the back cover of a book that links to the book's Amazon page for purchase.

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY USING PAPER?

We are interested in new applications for the EasyCode technology. For now, we would like to focus on applications of the EasyCode technology in which the codes are printed **on any type of paper**. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

[Carton:]

Here are a few examples of possible applications of EasyCodes using **carton**:

- Scanning an EasyCode on a business card could automatically save someone's contact information.
- Scanning an Easycode on a billboard could give the user additional information about the product or brand being promoted.

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY USING CARTON?

We are interested in new applications for the EasyCode technology. For now, we would like to focus on applications of the EasyCode technology in which the codes are printed **on any type of carton**. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

[Screen:]

Here are a few examples of possible applications of EasyCodes using **electronic screens**:

- Scanning an Easycode at the bottom of an email could automatically send, edit or save an appointment or date in the user's calendar.
- A user could scan an Easycode on a TV screen and download and play a game from a TV Show.

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY USING ELECTRONIC SCREENS?

We are interested in new applications for the EasyCode technology. For now, we would like to focus on applications of the EasyCode technology in which the codes are printed **on any type of electronic screens**. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

➤ *[Condition 4: no stimulus ideas, decomposed problem]:*

[Paper:]

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY USING PAPER?

We are interested in new applications for the EasyCode technology. For now, we would like to focus on applications of the EasyCode technology in which the codes are printed **on any type of paper**. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

[Carton:]

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY USING CARTON?

We are interested in new applications for the EasyCode technology. For now, we would like to focus on applications of the EasyCode technology in which the codes are printed **on any type of carton**. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

[Screen:]

WHAT COULD BE SOME APPLICATIONS OF THE EASYCODE TECHNOLOGY USING ELECTRONIC SCREENS?

We are interested in new applications for the EasyCode technology. For now, we would like to focus on applications of the EasyCode technology in which the codes are printed **on any type of electronic screens**. In the space provided below, please enter any new idea that you make think of. Each idea should propose a possible application of the EasyCode technology. You may propose as many ideas as you wish, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, press 'submit idea' first. (Note: your ideas will remain anonymous to other participants.)

[Robustness Check #3a: Stimulus Ideas Manipulation Only]

➤ [“Stimulus ideas” condition:]

Here are a few examples of possible applications of EasyCodes:

- A user could scan an EasyCode in a billboard or magazine and see a movie's trailer & show times.
- Scanning an EasyCode could automatically send, edit or save an appointment or date in the user's calendar.
- Scanning an EasyCode could automatically save someone's contact information.
- A user could scan an EasyCode at a bus stop and get the bus schedule on the fly.
- A user could scan an EasyCode on a TV screen and download and play a game from a TV Show.

[Instructions Identical to Study 1 Condition 1]

➤ [No Stimulus Ideas Condition: Identical to Study 1 Condition 2]

[Robustness Check #3b: Problem Decomposition Manipulation Only]

➤ [No Problem Decomposition Condition: Identical to Study 1 Condition 2]

➤ [Problem Decomposition Condition: Identical to Study 1 Condition 4]

Web Appendix A2: Study 2 Interface (Idea Generation Task)

Dear participant, we would like to invite you to submit your ideas regarding how to enhance customer experience in the following contexts: fast food restaurants, personal banking, movie theaters, and social media platforms. In what follows these tasks will be presented to you in random order.

Please think carefully and submit as many ideas as possible. Thank you!

To begin, please click the "Next" button below:

Next

[We present screenshots of the 4 conditions related to fast food restaurants below. Similar manipulations were employed for personal banking, movie theaters, and social media platforms. See more details below.]

➤ [Condition 1: stimulus ideas, not decomposed]

Welcome to our idea generation community! In this community you can submit your ideas and vote on existing ideas. We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine-in experience at these restaurants. Please think carefully and submit as many ideas as possible.

You may browse examples of ideas submitted by other participants below. You can click on the corresponding tab on the left to browse ideas under each category. You can also vote on them by clicking thumb-up 👍 or thumb-down 👎. Because these ideas were submitted by other participants, please excuse typos and/or grammatical errors.

Categories:

[Service](#)

[Products](#)

[Dine in experience](#)

Below are some ideas:

Previous Page Page 1 See More Ideas

👍1030👎 Very friendly service and appreciation of customers.

👍840👎 Have better trained and more polite employees. Provide strong incentive to maintain their good behavior.

👍550👎 Use a call ahead, carry out, curbside assistance program.

👍550👎 Serving speed.

👍550👎 Setup rewards programs. They don't need to offer huge benefits, but a free burger, or fries for being a loyal customer would be nice. Maybe you could win bigger prizes every once and awhile, if you're lucky.

How would we improve user experience at fast food restaurants?

Enter Idea Here

[The task descriptions for personal banking, movie theaters, and social media platforms were similar to the screenshot above, with the following modifications:]

[Personal Banking:]

*“We are interested in ideas that could enhance user experience with **personal banking**. We are looking for ideas that relate to the service provided by the banks, the products offered by the banks, or how the banks may educate their customers about their product/service offerings. Please think carefully and submit as many ideas as possible.”*

[The category breakdown on the left was “Service”, “Products”, and “Education.”]

[Movie Theater:]

*“We are interested in ideas that could enhance user experience in **movie theaters**. We are looking for ideas that relate to the seats, the screens, and the sound at the theaters, the experience management at the theaters, the food/snacks serviced in the theaters, the way tickets are processed, or special offers and programs offered by the theaters. Please think carefully and submit as many ideas as possible.”*

[The category breakdown on the left was “Seats, screens, and sound”, “Experience management”, “Food and snacks”, “Tickets”, and “Special offers and programs.”]

[Social Media:]

*“We are interested in ideas that could enhance user experience with **social network platforms**. We are looking for ideas that relate to the features of social media platforms, the management of social media platforms, the integration of social media platforms with each other and with other platforms, or ideas for new platforms/new technologies. Please think carefully and submit as many ideas as possible.”*

[The category breakdown on the left was “Features”, “Management”, “Integration”, and “New platforms or technologies.”]

[The following pop-up window appeared when “Enter Idea Here” was selected]

How would we improve user experience at fast food restaurants?

In the space provided below, please enter any new idea you may think of. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)

-Please select the idea's category-

-Please select the idea's category-
Service at fast food restaurants
Products offered by fast food restaurants
Dine-in experience in fast food restaurants

Submit Idea
Take Me Back to Idea Community

I Have No More Ideas

[In the personal banking, movie theaters, and social media platforms tasks, the drop-down menu included the corresponding categories associated with the corresponding task.]

➤ [Condition 2: no stimulus ideas, not decomposed]

We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine-in experience at these restaurants. Please think carefully and submit as many ideas as possible.

How would we improve user experience at fast food restaurants?

Enter Idea Here

[The task descriptions for the three other tasks are below:]

[Personal Banking:]

*“We are interested in ideas that could enhance user experience with **personal banking**. We are looking for ideas that relate to the service provided by the banks, the products offered by the banks, or how the banks may educate their customers about their product/service offerings. Please think carefully and submit as many ideas as possible.*

How would we improve user experience provided by banks?”

[Movie Theater:]

*“We are interested in ideas that could enhance user experience in **movie theaters**. We are looking for ideas that relate to the seats, the screens, and the sound at the theaters, the experience management at the theaters, the food/snacks serviced in the theaters, the way tickets are processed, or special offers and programs offered by the theaters. Please think carefully and submit as many ideas as possible.*

How would we improve user experience at movie theaters?”

[Social Media:]

*“We are interested in ideas that could enhance user experience with **social network platforms**. We are looking for ideas that relate to the features of social media platforms, the management of social media platforms, the integration of social media platforms with each other and with other platforms, or ideas for new platforms/new technologies. Please think carefully and submit as many ideas as possible.*

How would we improve user experience with social media platforms?”

[The following pop-up window appeared when “Enter Idea Here” was selected]

How would we improve user experience at fast food restaurants?

In the space provided below, please enter any new idea you may think of. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)

-Please select the idea's category-

-Please select the idea's category-
 Service at fast food restaurants
 Products offered by fast food restaurants
 Dine-in experience in fast food restaurants

Submit Idea

I Have No More Ideas

[In the personal banking, movie theaters, and social media platforms tasks, the drop-down menu included the corresponding categories associated with the corresponding task.]

➤ [Condition 3: stimulus ideas, decomposed]

[The “service” instructions below were shown first. These instructions were replaced with the “products” instructions after the respondent selected “I have no more ideas related to service,” and the “products” instructions were in turn replaced with the “dine-in experience” instructions after the respondent selected “I have no more ideas related to products.”]

[Service:]

Welcome to our idea generation community! In this community you can submit your ideas and vote on existing ideas. We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine-in experience at these restaurants. Please think carefully and submit as many ideas as possible.

You may browse examples of ideas submitted by other participants below. You can also vote on them by clicking thumb-up  or thumb-down . Because these ideas were submitted by other participants, please excuse typos and/or grammatical errors.

For now, we would like to focus on ideas related to the **service** in fast food restaurants. Below are some ideas:

[Previous Page](#) [Page 1](#) [See More Ideas](#)

 **1030**  Very friendly service and appreciation of customers.

 **840**  Have better trained and more polite employees. Provide strong incentive to maintain their good behavior.

 **550**  Use a call ahead, carry out, curbside assistance program.

 **550**  Serving speed.

 **550**  Setup rewards programs. They don't need to offer huge benefits, but a free burger, or fries for being a loyal customer would be nice. Maybe you could win bigger prizes every once and awhile, if you're lucky.

How would we improve the service in fast food restaurants?

[Enter Idea Here](#)

[The following pop-up window appeared when “Enter Idea Here” was selected]

How would we improve the service in fast food restaurants?

In the space provided below, please enter any new idea that may improve the **service** in fast food restaurants. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)

[The following window was shown when the respondent clicked "I have no more ideas related to Service".]

[Products:]

Welcome to our idea generation community! In this community you can submit your ideas and vote on existing ideas. We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine-in experience at these restaurants. Please think carefully and submit as many ideas as possible.

You may browse examples of ideas submitted by other participants below. You can also vote on them by clicking thumb-up  or thumb-down . Because these ideas were submitted by other participants, please excuse typos and/or grammatical errors.

For now, we would like to focus on ideas related to the **products** offered by fast food restaurants. Below are some ideas:

Page 1

  1070 Healthier choices

  1020 Healthier side options are always a good thing.

  900 The food should be affordable.

  890 Better healthy options. There is either salad or a burger, and what lies inbetween isn't really that good for you anyway (so much sodium). Find some other options in that middle ground that are actually good for you.

  890 Offer more fresh food menu items.

How would we improve the products offered by fast food restaurants?

[The following pop-up window appeared when "Enter Idea Here" was selected]

How would we improve the products offered by fast food restaurants?

In the space provided below, please enter any new idea that may improve the **products** offered by fast food restaurants. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)

[The following window was shown when the respondent clicked "I have no more ideas related to Products".]

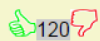
[Dine-in experience:]

Welcome to our idea generation community! In this community you can submit your ideas and vote on existing ideas. We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine-in experience at these restaurants. Please think carefully and submit as many ideas as possible.

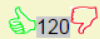
You may browse examples of ideas submitted by other participants below. You can also vote on them by clicking thumb-up  or thumb-down . Because these ideas were submitted by other participants, please excuse typos and/or grammatical errors.

For now, we would like to focus on ideas related to the **dine-in experience** in fast food restaurants. Below are some ideas:

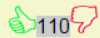
Page 1



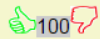
Classier dining areas.



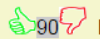
Cleaner restaurants.



Quiet areas in restaurant for those with laptops or books



Allow people to sit at a table and order from an electronic menu and have the food brought out or called out



Have the food prepared in an area the consumer can easily view if desired.

How would we improve the dine-in experience in fast food restaurants?

[The following pop-up window appeared when "Enter Idea Here" was selected]

How would we improve the dine-in experience in fast food restaurants?

In the space provided below, please enter any new idea that may improve the **dine-in experience** in fast food restaurants. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)



[Similarly, in personal banking, movie theaters, and social media platforms tasks, the respondent was shown the instructions for the corresponding subcategories in sequence. When indicating that he/she has no more ideas related to the current subcategory, the respondent was instructed to generate ideas for the next subcategory.]

➤ *[Condition 4: no stimulus ideas, decomposed]*

[Service:]

We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine in experience at these restaurants. Please think carefully and submit as many ideas as possible.

For now, we would like to focus on ideas related to the **service** in fast food restaurants.

How would we improve the service in fast food restaurants?

[The following pop-up window appeared when "Enter Idea Here" was selected]

How would we improve the service in fast food restaurants?

In the space provided below, please enter any new idea that may improve the **service** in fast food restaurants. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)

[The following window was shown when the respondent clicked "I have no more ideas related to Service".]

[Products:]

We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine-in experience at these restaurants. Please think carefully and submit as many ideas as possible.

For now, we would like to focus on ideas related to the **products** offered by fast food restaurants.

How would we improve the products offered by fast food restaurants?

[The following pop-up window appeared when "Enter Idea Here" was selected]

How would we improve the products offered by fast food restaurants?

In the space provided below, please enter any new idea that may improve the **products** offered by fast food restaurants. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)

Submit Idea

I Have No More Ideas Related to Products

[The following window was shown when the respondent clicked "I have no more ideas related to Products".]

[Dine-in experience:]

We are interested in ideas that could enhance user experience at **fast food restaurants**. We are looking for ideas that relate to the service in fast food restaurants, the products offered by these restaurants, or the dine-in experience at these restaurants. Please think carefully and submit as many ideas as possible.

For now, we would like to focus on ideas related to the **dine-in experience** in fast food restaurants.

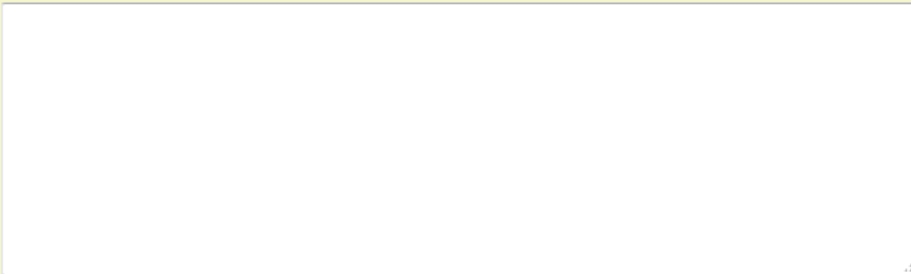
How would we improve the dine-in experience in fast food restaurants?

Enter Idea Here

[The following pop-up window appeared when "Enter Idea Here" was selected]

How would we improve the dine-in experience in fast food restaurants?

In the space provided below, please enter any new idea that may improve the **dine-in experience** in fast food restaurants. Please think carefully and submit as many ideas as possible, but **please do not enter more than one idea in the box below**. If you want to submit additional ideas, please press "submit idea" first. (Note: your ideas will remain anonymous to other participants.)



[Similarly, in personal banking, movie theaters, and social media platforms tasks, the respondent was shown the instructions for the corresponding subcategories in sequence. When indicating that he/she has no more ideas related to the current subcategory, the respondent was instructed to generate ideas for the next subcategory.]

Web Appendix A3: Robustness Checks #1 and #2 for Studies 1 and 2

Robustness Check #1: Results Based on Excluding Respondents with Survey Completion Time Less Than 1 Std. Dev. below the Average Survey Completion Time

Table A1: Study 1 Estimation Results

Parameter	Consumer Performance Metric Based on:	
	Adoption Intent	
	coeff.	s.e.
<u>Intercept</u>		
Intercept	-.334*	.077
<u>Main Effects</u>		
Knowledge	.111	.097
Stimulus	-.059	.091
Decomposition	.796*	.092
<u>Interaction Effects</u>		
Knowledge*Stimulus	-.327*	.121
Knowledge*Decomposition	.294*	.121

*significant at .05.

Table A2: Study 2 Estimation Results

Parameter	Consumer Performance Metric Based on:					
	Consumer Evaluation		Business Value Evaluation		Average of Two Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<u>Intercept</u>						
Intercept	-.570*	.054	-.455*	.055	-.513*	.054
s.d of intercept	.488*	.029	.497*	.030	.492*	.029
<u>Idea Generation Task</u>						
Personal Banking	-.174*	.053	-.273*	.053	-.223*	.053
Movie Theaters	.490*	.053	.313*	.053	.401*	.053
Social Media Platforms	-.107*	.053	-.258*	.0534	-.182*	.053
<u>Main Effects</u>						
Knowledge	.179*	.043	.186*	.043	.183*	.043
Stimulus	-.017	.038	-.024	.038	-.020	.037
Decomposition	1.055*	.038	1.047*	.038	1.051*	.038
<u>Interaction Effects</u>						
Knowledge*Stimulus	-.193*	.047	-.203*	.047	-.198*	.047
Knowledge*Decomposition	.120*	.047	.106*	.047	.113*	.047

*significant at .05.

Table A3: Benefits from Customizing Idea Generation Tasks

Consumer Performances	Low Knowledge		High Knowledge		All Consumers	
	mean	s.e.	mean	s.e.	mean	s.e.
<i>Study 1</i>						
Cond1: stimulus ideas, not decomposed	8.984	5.756	5.389	4.635	6.680	5.328
Cond2: no stimulus ideas, not decomposed	7.551	4.937	8.477	6.564	8.057	6.253
Cond3: stimulus ideas, decomposed	16.658*	7.111	17.101	7.022	16.905	7.661
Cond4: no stimulus ideas, decomposed	12.022	6.607	21.737*	11.022	17.312	8.285
Customized: low know in cond3 + high know in cond4	-	-	-	-	19.393*	8.400
<i>Study 2</i>						
Cond1: stimulus ideas, not decomposed	6.569	5.134	5.643	4.301	6.064	4.713
Cond2: no stimulus ideas, not decomposed	5.173	4.234	7.479	4.258	6.390	4.393
Cond3: stimulus ideas, decomposed	15.236*	9.187	15.736	10.057	15.519	10.279
Cond4: no stimulus ideas, decomposed	12.173	8.515	19.445*	13.169	15.759	10.124
Customized: low know in cond3 + high know in cond4	-	-	-	-	17.474*	11.928

*best in column at .05

Robustness Check #2: Results with Respondents with Zero Idea Submission Omitted

Table A4: Study 1 Estimation Results

Parameter	Consumer Performance Metric Based On:	
	Adoption Intent	
	coeff.	s.e.
<u>Intercept</u>		
Intercept	-.320*	.091
<u>Main Effects</u>		
Knowledge	.053	.111
Stimulus	-.102	.101
Decomposition	.739*	.101
<u>Interaction Effects</u>		
Knowledge*Stimulus	-.427*	.130
Knowledge*Decomposition	.269*	.130

*significant at .05.

Table A5: Study 2 Estimation Results

Parameter	Consumer Performance Metric Based on:					
	Consumer Evaluation		Business Value Evaluation		Average of Two Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<u>Intercept</u>						
Intercept	-.669*	.054	-.545*	.054	-.607*	.054
s.d of intercept	.502*	.030	.504*	.030	.502*	.030
<u>Idea Generation Task</u>						
Personal Banking	-.151*	.053	-.257*	.053	-.204*	.053
Movie Theaters	.537*	.052	.345*	.053	.441*	.052
Social Media Platforms	-.084*	.053	-.245*	.053	-.164*	.052
<u>Main Effects</u>						
Knowledge	.170*	.044	.175*	.044	.172*	.044
Stimulus	.040	.037	.031	.038	.036	.037
Decomposition	1.102*	.037	1.094*	.038	1.098*	.037
<u>Interaction Effects</u>						
Knowledge*Stimulus	-.199*	.048	-.211*	.048	-.205*	.048
Knowledge*Decomposition	.093*	.047	.079*	.040	.086*	.040

*significant at .05.

Table A6: Benefits from Customizing Idea Generation Tasks

Consumer Performances	Low Knowledge		High Knowledge		All Consumers	
	mean	s.e.	mean	s.e.	mean	s.e.
<i><u>Study 1</u></i>						
Cond1: stimulus ideas, not decomposed	10.957	5.192	8.491	4.359	9.565	5.210
Cond2: no stimulus ideas, not decomposed	7.217	4.732	11.878	6.361	9.706	5.774
Cond3: stimulus ideas, decomposed	21.848*	7.013	16.997	7.033	19.452	7.764
Cond4: no stimulus ideas, decomposed	14.441	5.587	23.066*	10.866	18.548	9.985
Customized: low know in cond3 + high know in cond4	-	-	-	-	22.442*	8.081
<i><u>Study 2</u></i>						
Cond1: stimulus ideas, not decomposed	7.396	4.679	6.030	4.105	6.654	4.447
Cond2: no stimulus ideas, not decomposed	5.331	4.074	7.750	4.074	6.587	4.243
Cond3: stimulus ideas, decomposed	16.781*	7.365	16.413	9.706	16.578	8.727
Cond4: no stimulus ideas, decomposed	13.594	8.131	20.496*	12.834	16.810	9.897
Customized: low know in cond3 + high know in cond4	-	-	-	-	18.694*	9.337

*best in column at .05

Web Appendix A4: Method and Results of Robustness Check #3 for Study 1

Method

In this robustness check, we tested our H1 and H2 using a different sample of respondents. We also used consumer performance metrics based on alternative idea quality ratings coming from three different panels of evaluators. More details of this robustness check are given below.

Specifically, we emphasized each type of search cues at a time. We focus on the interaction between stimulus ideas and consumer knowledge in our robustness check 3a, and that between problem decomposition and consumer knowledge in robustness check 3b. Two hundred and two freshman and sophomore undergraduate students enrolled in the subject pool of a major west coast university participated in the idea generation task in either robustness check 3a ($N = 106$) or robustness check 3b ($N = 96$) in exchange for course credit.

The respondents accessed the study via computers in a behavioral lab. The overall flow of the idea generation task and the implementation of the manipulations were similar to Study 1. In robustness check 3a, we varied the task structure by manipulating whether stimulus ideas were presented to the respondents, while keeping the task undecomposed in all conditions. In the stimulus ideas condition, all respondents were exposed to an identical set of five stimulus ideas. In robustness check 3b, we focused on the problem decomposition manipulation, with no stimulus ideas presented in any condition.

A total of 193 ideas were generated in robustness check 3a, and 202 ideas were submitted in robustness check 3b. To test the robustness of our Study 1 findings, in addition to the adoption intent measure, we also collected measures on the overall attractiveness and the business value of the generated ideas. Overall attractiveness was assessed by a different set of respondents recruited from the same subject pool as the respondents who participated in the idea generation task, using a paradigm similar to the one used to measure adoption intent. Specifically, after a brief description of the EasyCode technology, each respondent was shown a set of 15 ideas (selected randomly from those with the fewest evaluations on that dimension up to that point) and asked to “select as many or as few ideas” among the list based on the likelihood of “finding the idea useful and adopting it if available.” Business value was assessed using a panel of business major senior students who participated in the idea evaluation task as part of a class assignment. These respondents were unaware of any other task related to our studies. As business major seniors, these students had received formal training in evaluating the business value of new product ideas through a series of business classes. We further refreshed their memory with a lecture on this particular topic shortly before distributing this assignment. Following Girotra et al. (2010), we instructed the students that an idea’s technical feasibility, novelty, specificity, and potential market demand should be accounted for when the idea is being evaluated for its business value on a 10-point scale.

Accordingly, we calculated the following four measures of consumer performance for each participant in our idea generation task: performance based on 1) the adoption intent of ideas generated; 2) the overall attractiveness of ideas generated; 3) the business value of ideas

generated; and 4) the average of the standardized consumer performance metrics using these three idea quality measures.

Additionally, the existence of identical or nearly identical ideas may add noise to our performance measures. In this robustness check, we further recruited a separate set of consumers from Amazon's Mechanical Turk Consumer Panel ($N = 120$) to identify nearly identical ideas in each condition.

We used the method proposed by Kornish and Ulrich (2011) to identify such ideas. Specifically, each respondent was presented with ideas from the same condition and asked to identify sets of two or more ideas that were identical or nearly identical. As recommended by Kornish and Ulrich (2011), ten or more respondents evaluated each subset of ideas and the more conservative "majority threshold" was used to identify identical or nearly identical ideas (namely, at least 50% of the raters identified the ideas as being identical or nearly identical).

We found that, among all ideas received, less than 5% were considered to be identical or nearly identical using the "majority threshold" rule. This finding is also consistent with Kornish and Ulrich (2011) that redundancy is quite small in idea generation tasks. We combined nearly identical ideas from the same respondent into one idea and averaged their quality scores. Our consumer performance metrics were then calculated based on the adjusted idea quality ratings. We decided to leave nearly identical ideas from different respondents unchanged in our analysis because they represented fewer than 2% of the total ideas submitted and they appeared to be evenly distributed across conditions. The summary statistics from this robustness check are provided in Table A7.

Table A7: Summary Statistics from Robustness Check #3 of Study 1

	Robustness Check 3a		Robustness Check 3b	
<i>Idea Generation</i>				
<i>Participants Type</i>	freshmen/sophomores		freshmen/sophomores	
<i># of Participants</i>	106		96	
	mean	std. dev.	mean	std. dev.
<i>Consumer Knowledge Score (1-5)</i>	2.410	.702	2.438	.801
<i># of Ideas</i>	1.802	1.828	1.990	1.997
<i>Idea Quality Score Metric 1 (1-10)</i>	6.843	1.712	6.844	1.618
<i>Consumer Performance Metric 1</i>	12.330	11.658	13.616	10.412
<i>Idea Quality Score Metric 2 (0-1)</i>	.557	.171	.586	.144
<i>Consumer Performance Metric 2</i>	1.004	1.262	1.167	1.613
<i>Idea Quality Score Metric 3 (1-10)</i>	6.001	.889	7.175	.690
<i>Consumer Performance Metric 3</i>	10.814	12.531	14.278	16.924
<i>Idea Evaluation</i>				
<i>Idea Quality Metric 1: Adoption Intent</i>				
<i>Participants Type</i>	mturk		mturk	
<i># of Participants</i>	371		397	
<i># of Evaluations Per Idea</i>	38.400	1.191	39.302	1.198
<i>Idea Quality Metric 2: Overall Attractiveness</i>				
<i>Participants Type</i>	freshmen/sophomores		freshmen/sophomores	
<i># of Participants</i>	256		234	
<i># of Evaluations Per Idea</i>	20.105	2.303	17.658	1.938
<i>Idea Quality Metric 3: Business Value Evaluations</i>				
<i>Participants Type</i>	business seniors		business seniors	
<i># of Participants</i>	38		33	
<i># of Evaluations Per Idea</i>	38		33	

Results

We tested H1 based on robustness check 3a by regressing each respondent's performance on: 1) the mean-centered knowledge score; 2) a dummy variable denoting whether or not the stimulus ideas were present; and 3) their interaction:

$$(A1) \quad Y_j^m = \beta_0 + \beta_K * K_j + \beta_{ST} * ST_j + \beta_{K*ST} * K_j * ST_j + \varepsilon_j$$

with Y_j^m being respondent j 's standardized performance score on metric m , K_j being the respondent's mean-centered domain-specific knowledge score, and ST_j being an indicator variable denoting whether respondent j was exposed to stimulus ideas.

We ran four separate regressions using the four measures of consumer performance. The results are shown in Table A8a. All four regressions revealed a significant negative two-way interaction, confirming H1 that there is a negative interaction between consumer knowledge and stimulus ideas.

Given that the consumer performance metrics based on the three idea quality measures gave rise to consistent conclusions in our hypothesis testing, we further conducted spotlight analysis using the average of the three standardized consumer performance metrics. A regression analysis with knowledge scores centered at one standard deviation below the mean revealed that stimulus ideas significantly enhanced performance of low-knowledge consumers ($\beta_{ST}^{LowKnow} = .567, t = 2.10, p < .05$). A similar spotlight analysis at one standard deviation above the mean showed that the performance of high-knowledge consumers was significantly reduced by stimulus ideas ($\beta_{ST}^{HighKnow} = -.311, t = 1.98, p < .05$).

Similarly, the following regression was run to test H2 based on robustness check 3b:

$$(A2) \quad Y_j^m = \beta_0 + \beta_K * K_j + \beta_{DE} * DE_j + \beta_{K*DE} * K_j * DE_j + \varepsilon_j$$

with DE_j being an indicator variable denoting whether respondent j completed a decomposed task.

The regression results are shown in Table A8b. Consistent with H2, all four regressions demonstrated a positive interaction between consumer knowledge and problem decomposition interaction. Spotlight analysis based on the average of the three standardized consumer performance metrics also confirmed that problem decomposition helped high-knowledge consumers significantly more than their low-knowledge counterparts ($\beta_{DE}^{HighKnow} = 1.111, t = 4.48, p < .01$; $\beta_{DE}^{LowKnow} = .306, t = 2.24, p < .05$).

Table A8: Study 1 Robustness Check #3 Estimation Results

Table A8a: Stimulus Ideas

Parameter	Consumer Performance Metric Based on:							
	Adoption Intent		Overall Attractiveness		Business Value		Ave. of Three Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<u>Intercept</u>								
Intercept	-.043	.142	-.119	.140	-.028	.141	-.063	.139
<u>Main Effects</u>								
Knowledge	.370	.213	.359	.210	.313	.212	.348	.209
Stimulus	.090	.193	.233	.191	.062	.193	.128	.190
<u>Interaction Effects</u>								
Knowledge*Stimulus	-.583*	.280	-.674*	.276	-.620*	.279	-.626*	.275

*significant at .05.

Table A8b: Problem Decomposition

Parameter	Consumer Performance Metric Based on:							
	Adoption Intent		Overall Attractiveness		Business Value		Ave. of Three Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<i>Intercept</i>								
Intercept	-.358*	.122	-.291*	.128	-.327*	.130	-.325*	.122
<i>Main Effects</i>								
Knowledge	.217	.156	.133	.164	.065	.167	.138	.156
Decomposition	.775*	.175	.642*	.183	.710*	.186	.709*	.175
<i>Interaction Effects</i>								
Knowledge*Decomposition	.494*	.219	.539*	.229	.474*	.233	.502*	.219

*significant at .05.

As in studies 1 and 2, we further verify whether these results hold when we excluded respondents with survey completion time less than one standard deviation below the average completion time or respondents who did not submit any idea. All findings discussed above hold (see Table A9 and Table A10).

Table A9: Results Based on Excluding Respondents with Survey Completion Time Less Than 1 Std. Dev. below the Ave. Survey Completion Time

Table A9a: Stimulus Ideas

Parameter	Consumer Performance Metric Based on:							
	Adoption Intent		Overall Attractiveness		Business Value		Ave. of Three Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<i>Intercept</i>								
Intercept	.019	.157	-.076	.155	.039	.156	-.006	.154
<i>Main Effects</i>								
Knowledge	.298	.222	.300	.219	.233	.220	.277	.218
Stimulus	-.030	.207	.137	.204	-.064	.206	.015	.203
<i>Interaction Effects</i>								
Knowledge*Stimulus	-.587*	.293	-.699*	.289	-.625*	.291	-.637*	.287

*significant at .05.

Table A9b: Problem Decomposition

Parameter	Consumer Performance Metric Based on:							
	Adoption Intent		Overall Attractiveness		Business Value		Ave. of Three Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<i>Intercept</i>								
Intercept	-.358*	.138	-.278*	.144	-.365*	.151	.330*	.139
<i>Main Effects</i>								
Knowledge	.245	.171	.154	.179	.075	.188	.158	.173
Decomposition	.670*	.187	.544*	.196	.639*	.206	.618*	.189
<i>Interaction Effects</i>								
Knowledge*Decomposition	.456*	.230	.497*	.241	.466 ^a	.253	.473*	.233

*significant at .05; ^amarginally significant at .1.

Table A10: Results Based on Respondents with Zero Idea Submission Omitted

Table A10a: Stimulus Ideas

Parameter	Consumer Performance Metric Based on:							
	Adoption Intent		Overall Attractiveness		Business Value		Ave. of Three Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<i>Intercept</i>								
Intercept	-.072	.155	-.163	.150	-.056	.153	-.097	.151
<i>Main Effects</i>								
Knowledge	.374	.220	.363	.213	.310	.217	.349	.214
Stimulus	.179	.214	.357	.217	.151	.212	.229	.208
<i>Interaction Effects</i>								
Knowledge*Stimulus	-.820*	.295	-.927*	.286	-.873*	.292	-.873*	.287

*significant at .05.

Table A10b: Problem Decomposition

Parameter	Consumer Performance Metric Based on:							
	Adoption Intent		Overall Attractiveness		Business Value		Ave. of Three Metrics	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
<i>Intercept</i>								
Intercept	-.393*	.143	-.305*	.151	-.353*	.154	-.350*	.144
<i>Main Effects</i>								
Knowledge	.208	.173	.115	.182	.030	.186	.118	.173
Decomposition	.776*	.198	.613*	.209	.698*	.212	.696*	.198
<i>Interaction Effects</i>								
Knowledge*Decomposition	.433 ^a	.238	.480*	.245	.451 ^a	.256	.443*	.218

*significant at .05; ^amarginally significant at .1.