Title: Findings from an Ongoing Examination of Metrics for Innovation in the U.S. Business Sector

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Summary:
A revised approach has been developed and is currently being tested for measuring innovation on two U.S. federal surveys. Using the Oslo Manual definition of innovation a series of yes/no questions were developed to identify innovators and to what extent are they innovating. In addition, follow up questions have been developed to ask respondents to specify what they mean when they respond in the affirmative to questions about the incidence of innovation. This paper will discuss the various approaches to asking about innovation, present findings, and suggest long-term approaches for addressing the issues regarding innovation measurement.

Background
The National Science Foundation's (NSF) National Center for Science and Engineering Statistics (NCSES), as part of its legislated mandate, collects, analyzes, and reports objective data on U.S. R&D trends, the science and engineering workforce, and U.S. competitiveness in science, engineering, technology, and R&D. As part of this mission, NCSES has a longstanding interest in better measurement of the processes of innovation and the contributions to the U.S. science and engineering enterprise. One of the priorities for NCSES efforts in recent years has been on improved indicators for business sector innovation and sounder methods for cross-national comparisons.

Since 2008, NCSES has collected data on the incidences of product and process innovation through its annual Business R&D and Innovation Survey (BRDIS). The questions in BRDIS on innovation have drawn on the definitions of innovation and the survey approach recommended by the OECD/Eurostat Oslo Manual (OM; 2005 edition) and incorporated in the EU Community Innovation Surveys (CIS) implemented periodically by Eurostat since the mid-1990s.

1 The authors wish to acknowledge the contributions of John Jankowski, R&D Statistics Program Director, National Center for Science and Engineering Statistics, National Science Foundation for technical guidance and content review in the development of this paper.


BRDIS is an annual, nationally representative sample survey of all for-profit, nonfarm companies (manufacturing and non manufacturing) that are publicly or privately held and have five or more employees in the United States. In 2014, a total of 44,162 companies were sampled, representing 1,998,858 companies. With the start of the business innovation data from BRDIS in 2008, it became possible to compare U.S. innovation incidences with those reported for the CIS countries. However, the early round findings from this BRDIS data led to numerous questions within NCSES about the innovation questions being asked and companies’ interpretation of these questions.

NCSES’ Microbusiness, Innovation, Technology and Science (MIST) survey was designed to fill a gap created by BRDIS. MIST is a survey of microbusinesses operating in the United States with fewer than five employees. A two-phase pilot survey was conducted during 2015. During the cognitive testing of the MIST questionnaire, significant changes were made to the innovation questions as the OM/CIS – based innovation questions did not work as well as desired.

As a direct result, NCSES elected to more thoroughly consider the metrics and survey methods used for innovation measurement. A multi-phase approach was developed:

- **Phase 1**: Cognitive interviews with 30 firms in the United States and 20 firms in Europe (conducted by our counterparts in Europe) to better understand what firms interpret innovation to be, what they make of the innovation survey questions being asked, how they measure innovation for purposes of their own business planning.
- **Phase 2**: Interviews with academic researchers to understand whether researchers are using the Oslo definition of innovation in their research and to identify what other approaches are being piloted.
- **Phase 3**: A pair of Innovation Metrics Panel Meetings in December 2014 bringing together federal, state and other policymakers to better understand the types of innovation questions that policymakers are grappling with and the data they find useful.

Findings from most of these NCSES activities have already been published. Key findings include:

- Nearly all of the business respondents could readily offer a definition of innovation, i.e., something of commercial value that is new or unique – although phrased in many variations. Further, there was wide agreement that “new to the market or industry” would be innovation, but not so for changes that are simply “new to the company”. In addition, the concept of “significantly improved” – a main qualifier in

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the Oslo Manual definitions of product and process innovation was widely ambiguous to respondents.⁴

- Similarly, most of the interview participants indicated that in general “innovation” entailed a commercial achievement and is not the same as what would be classified as an incremental “improvement”. And, while many of the interview participants described innovation as key to the continued viability of their companies, few said they spend much time thinking about and planning for “innovation” per se.

- Many companies said an innovation needed to be successfully commercialized in order to be considered an innovation.

- Few metrics apply consistently to all industries. Some market/industry context frequently appears essential to set thresholds that can discriminate mere improvements from the more substantial change implied by “innovation.”

- Respondents were often unable to make a clear distinction between organizational and process innovation and most examples of marketing innovations involved promotions, in particular adapting to the internet and other digital media. Very few companies understand what is meant by marketing and organizational innovation and the categories tend to blend together.⁵

- Few companies maintained formal innovation metrics and records of innovation revenue and expenditure data are incomplete at best.⁶

- Key challenges of the innovation data currently available are: the time lag, the fact that industry differences matter, that data sets are often not comparable, and that collecting innovation data is expensive.⁷

**Criticisms of existing innovation surveys**

Surveys such as NCSES’ BRDIS and Eurostat’s Community Innovation Survey attempt to measure innovation and while they have clearly pushed this endeavor forward they are not without flaws. The mapping of firms to industries is difficult due to: 1) Larger firms having operations in multiple industry sectors, 2) Migration between sectors over time (e.g., pharmaceutical to wholesale or distributor NAICS codes), and 3) Taxonomy issues inherent in NAICS (e.g., the NAICS code for a headquarters operation offers no industry-specific information).

Who within a firm responds to the survey can change the results, and there are several challenges in how firms might assemble their responses:

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⁵ Ibid.

⁶ Ibid.

Firms do not maintain a centralized repository of information about new product launches or the expenditures devoted to the development of innovative products or services. Business divisions are more likely to provide better information than the administrative headquarters, but there may also be notable differences in the innovation definitions that each apply.

Panelists did not believe the CFO is the right recipient of an innovation survey, nor is the CEO in medium or large companies because of his or her distance from the actual innovation projects that are likely occurring in the business units.

International comparability remains a challenge due to differences in:

- Coverage of industries and size thresholds of companies
- The more basic indicators may not be very meaningful, e.g., incidence of innovation.
- The more meaningful indicators can be complicated and hard to communicate.
- Numerous methodological challenges as well

Revised approach to innovation measurement

Considering all the criticisms and challenges in developing innovation measurement questions, NCSES took a different approach when developing the Microbusiness, Innovation, Science & Technology Survey (MIST). MIST was developed to collect R&D and other innovation-related data from a sample of independent U.S. microbusinesses (that is, those with fewer than five employees) thus filling the gap created by BRDIS, which surveys only businesses with five or more employees.

The key goals of MIST were the following:

- Collect national statistics on R&D expenditures and other related statistics among the smallest businesses (fewer than five employees) in the United States.
- Allow for a better understanding of the innovative activities conducted by the smallest businesses in the United States.
- Collect statistical data on US competitiveness in science, engineering, and technology.
- Help policy makers address issues such as how small businesses are affected by the rapid changes in our economy and what the smallest businesses are doing to be competitive.

In developing the MIST questionnaire NCSES started by using questions that provided definitions of product innovation and process innovation that had been used in other national and international surveys, in order to facilitate comparisons across surveys. However, there was a concern that participants would interpret and respond to these questions inconsistently. For example, some companies that provide software services might interpret and respond that almost everything they create is something new (or at least improved, if it involves adapting existing software), while others might not.
Rather than define innovation broadly, specific elements of innovation from the Oslo Manual were asked. Also, instead of putting a definition at the start (where it might be skipped), the definitions were incorporated into the question items. Questions about new or improved goods that were “new to your market” versus “only new to your company” were deleted. This resulted in collecting data about specific types of product innovation.

Each aspect of innovation (product, process, marketing, and organization) was broken into individual yes/no questions. For example, instead of asking the following BRDIS question on the MIST survey:

During the last three years, did your company introduce any of the following?

- a. New or significantly improved goods
   Do not include:
   - The simple resale of new goods purchased from others
   - Changes of a solely aesthetic nature

- b. New or significantly improved services

The product innovation question was revised to the following:

During the last three years, did your company do each of the following regarding the goods or services your company offers? Do not include adaptation or customization of your company’s goods or services for a specific client’s needs.

- a. Offered a new good or service that no company has ever offered before
- b. Offered a new good or service that your company has never offered before
- c. Improved good’s performance by making changes in materials, equipment, components, or software
- d. Developed a new use for one of your goods or services
- e. Added a new feature to one of your goods or services
- f. Made it easier for customers to use one of your goods or services (e.g., easier access, more user friendly)

These changes in the product innovation question proved helpful in guiding respondents to better focus on what specific activities they performed. It also had the benefit of encouraging better characterization of the types of innovation firms engaged in, rather than just on whether the firms were self-identifying as innovative.

Respondents were asked the innovation questions only after responding yes to a question on selling goods or services over the prior three years. During the pilot survey nearly all respondents said they did sell goods or services. As a result nearly all respondents during the pilot survey received the innovation questions.
Analysis of Existing Questions

BRDIS contains questions on product and process innovation only. Following the guidance in the Oslo Manual, MIST includes questions on product, process, marketing and organizational innovation. In each case the Oslo Manual definition was broken down into its components and respondents were asked a yes or no question for each component. Prior to being asked the innovation questions, respondents were asked if they sold any goods or offered any services during the previous three-year period. If the respondent said yes, only then were they asked the innovation questions. The innovation questions for MIST are included in the MIST questionnaire presented in Appendix A. The innovation questions are questions 17 – 20.

The first series of questions (questions 17a – f) is the product innovation question. Approximately one-fifth of respondents said yes to question 17a (During the last three years, did your company offer a new good or service that no company has ever offered before). Less than one-half of respondents said yes to question 17b (During the last three years, did your company offer a new good or service that your company has never offered before). There is significant overlap between those who said yes to questions 17a and 17b, 49% said yes to new goods or services that were either new to the universe or new to the company. These numbers appear high, until it is remembered that the MIST pilot was only conducted with certain industries, i.e., those that report relatively high R&D intensities on BRDIS.8

More than four out of five respondents said yes to any of the six product innovation questions. The proportion is similar for process innovation. For marketing innovation three-quarters of respondents said yes to one of those statements and for organizational innovation just over three out of five respondents said yes to one of those statements. Overall, out of the 21 innovation statements, more than one-half of respondents said yes to nine or more of the innovation statements.

This suggests a significant drawback when asking the innovation questions in this manner. If we define business innovators as anyone who said yes to at least one innovation statement that results in over 90% innovators, a seeming over inflation of the percentage of innovators among US microbusinesses.

This suggests that, when analyzing the MIST data, the data should not be combined to say that anyone who responded yes to any of the innovation questions should be classified as an innovator. The data, when combined, suggests that some of the statements from the Oslo Manual could identify innovators when they should not be classified as such. For example, if a respondent indicates yes, they developed a new use for one of their goods or services (question 17d), or yes, they upgraded techniques, equipment, or software to significantly improve the goods or services they offer (question 18c) should that respondent be classified as an innovator or should innovators only be classified as those who introduce a new of significantly product or process? Utilizing the MIST series of questions those who introduce a new or significantly product or process as well as those who complete other innovation activities can be identified. However, it could be an over estimate to classify any business that undertakes any innovation activities as an innovator.

8 The industries included in the MIST pilot survey are listed in Appendix B.
Survey Comparisons

Overall, about 15% of the for-profit companies from the BRDIS survey introduced one or more product or process innovations in 2012-2014. It was higher for manufacturing industries (32%) than for non-manufacturing industries (14%).

The MIST survey was only conducted with certain industries and only in a pilot survey setting. As such, overall comparisons between BRDIS and MIST are not possible. However, several industries can be reviewed. Table 1 presents comparisons for product innovation between the two surveys for five industries.

For the BRDIS the percentage who said yes is from the following question.

During the last three years, did your company introduce any of the following?

New or significantly improved goods

Do not include:
- The simple resale of new goods purchased from others
- Changes of a solely aesthetic nature

For the MIST survey the percentage presented is the percentage who said yes to the following question.

During the last three years, did your company do each of the following regarding the goods or services your company offers? Do not include adaptation or customization of your company’s goods or services for a specific client’s needs.

17a. Offered a new good or service that no company has ever offered before?

The wording is slightly different for the two questions. The MIST example does not include the phrase “new or significantly improved” while the BRDIS example does. An additional difference between the two surveys is that BRDIS includes all businesses with five or more employees, while MIST includes businesses with nine or fewer employees. However, comparing the results does help us to better understand the incidence of innovation at US businesses and where issues may exist.
Table 1 presents the incidence of product innovation for both the BRDIS and MIST surveys for five industries. With the exception of code 3391 – Medical Equipment and Supplies Manufacturing, the differences between the BRDIS and the MIST findings are notable. The biggest difference between the two questions on each survey is that the BRDIS survey uses the phrase “new or significantly improved goods or services” while MIST does not. MIST asks respondents if their company offered a new good or service that no company ever offered before. The actual questions used are on the previous page as well as in Appendix A – MIST questionnaire.

Another difference is that in the data presented here, the BRDIS figures include only businesses with between five and nine employees, while MIST includes businesses with fewer than ten employees. MIST was a pilot survey while BRDIS was not.

However, the biggest difference is the question wording. On page 2, it was noted that the phrase, “significantly improved” was ambiguous to some respondents. While these results do not confirm or refute that, it does suggest that as NCSES moves forward with next steps the phrasing must be part of future research.

It is important to note that when looking at the total for all industries BRDIS includes nearly all non-farming industries, while MIST includes only a handful of industries.

Innovation Follow up

When the NCSES cognitive interviews with U.S. businesses were conducted, respondents, in general and with few exceptions, agreed with the Oslo definitions and appeared to
interpret them correctly. However, an experiment conducted with the University of Maryland, Joint Program on Survey Methodology (JPSM) showed that perhaps these questions still need more refinement.

The MIST questionnaire (See Appendix A) was distributed by JPSM to approximately 1,000 microbusinesses. These respondents were asked about innovation as part of the full questionnaire. However, when they responded yes to any part of questions 17 – 20 (see Appendix A) they were asked a follow up question requesting them to describe their innovation and provide examples. Each example was coded by one of the JPSM students and then recoded by another student. Double coding of open-ended responses should mitigate against different interpretations, but considering that the students were relatively new to innovation measurement caution should be used.

This approach of asking for examples in a follow up question enables more qualitative linkage between the Oslo Manual definitions of innovation to actual innovations created by business respondents.

For example, if a respondent said yes that their business decreased production costs by improving the materials, components, or software, we can understand what that respondent meant when they responded by saying yes.

When a respondent says, “I learned to use Pivot Tables in MS Excel to more quickly and accurately process large amounts of data for clients.” we can question if that is truly an innovation according to the Oslo Manual definition.

Asking a follow up question assists in understanding if the respondents have full comprehension of what they are being asked. It also allows the survey to examine whether or not innovations cited are truly innovative.

Below are examples of what respondents provided when asked to describe their innovations.

<table>
<thead>
<tr>
<th>17a</th>
<th>“We have produced survey and analysis methods to significantly reduce energy consumption in data centers with very low cost materials and procedures.”</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>All Other Professional, Scientific, and Technical Services</td>
</tr>
<tr>
<td>17a</td>
<td>“(Business name) produces protective coatings. We introduced a new line of materials specifically formulated for the petrochemical hydro-fracturing market.”</td>
</tr>
<tr>
<td></td>
<td>Paint and Coating Manufacturing</td>
</tr>
<tr>
<td>17b</td>
<td>“We introduced a product that specifically monitors shore power.”</td>
</tr>
<tr>
<td></td>
<td>All Other Professional, Scientific, and Technical Services</td>
</tr>
</tbody>
</table>
18a “Used a new way of purchasing and re-selling software as a "value added" product or service; used a new way of computing and demonstrated this capability to customers.”

Administrative Management and General Management Consulting Services

18d “We have used (a) Google drive to allow all employees to track time spent on project sites, truck mileage, notes on specific projects, etc. In this way, all info on site work is shared among all employees.”

Landscape Architectural Services

19a “(The business) introduced a more retail friendly packaging concept with clearer call outs for features, more visibility of the product and a smaller footprint to maximize the number of units to fit on a shelf or display.”

Administrative Management and General Management Consulting Services

19b “Began a strategic partnership with large trade organization, updated logo and marketing material, upgraded trade show exhibit booth.”

Computer Systems Design and Related Services

19e “Yes - expanded into other vertical markets”

Administrative Management and General Management Consulting Services

20a “ISO 9001 - continuous improvements made to production lines to add greater quality to customer products. Mostly in chemicals and monitors on tanks for greater control of ph and titrations.”

Fabricated Metal Product Manufacturing

20b “Again, developed a total plant manufacturing concept for improved flow, reduction in headcount and improved delivery methods at a lower cost.”

Other Management Consulting Services

By asking the follow up question, we gain further insight into what respondents think of the Oslo Manual and how close that adheres to the Oslo Manual definition of innovation. For example, when respondents are asked the follow up question after question 19b - Promoted your company’s goods or services in a new way, several respondents mentioned that they now have a Facebook page and market their company on Facebook. However, the
question must be asked is that innovation.

To further break down the issue, the text from the section of the Oslo Manual on marketing innovation is as follows:

The implementation of a marketing method not previously used by the firm. It must be part of a new marketing concept or strategy that represents a significant departure from the firm’s existing marketing methods. The new marketing method can either be developed by the innovating firm or adopted from other firms or organisations. New marketing methods can be implemented for both new and existing products. (paragraph 171).

This was translated into the following question (question 19b):

Promoted your company’s goods or services in a new way (e.g., the first time use of a new type of advertising, a new brand image, introduction of loyalty cards).

Using Facebook could be a new marketing method used by a business. It could be very different from what the firm was doing before, which could have been nothing or marketing only through print options such as newspapers or magazines. However, should this be considered an innovation and should this firm be considered an innovative firm? In general, the answer should be no. While using Facebook may be new to a firm and appears to match the definition from the Oslo Manual, marketing goods and services on Facebook is not new. So this on its own should not classify a firm as innovative. If it is considered innovative this will result in extremely high proportions of innovative firms.

That being said, a legitimate criticism is that perhaps the question does not adhere closely enough to the Oslo Manual definition. Indeed the next time this question is utilized the wording will be changed slightly.

Implemented a new marketing method not previously used by your company that represents a significant departure from your company’s existing marketing methods.

But whether or not this revised statement would result in different examples from respondents remains to be seen.

**Analysis of the Follow up Responses**

For each of the qualitative follow up questions an analysis was conducted where each response was categorized whether the response provided was an innovation or not an innovation based on the Oslo Manual definition. Essentially, when the respondents stated yes to the question, JPSM attempted to determine whether the example provided was an innovation.

An analysis of that data suggests that further clarifications and improvements are necessary on the innovation questions. In most cases only about one-half to two-thirds of respondents provided an example that could be defined as innovation under the Oslo Manual definition. Question 17 is product innovation, question 18 is process innovation, question 19 is marketing innovation and question 20 is organizational innovation. Refer to Appendix A for the full text of each question.
Out of the 21 innovation statements, the following four resulted in fewer than 50% of the responses being coded as innovations:

Product Innovation
17a. Offered a new good or service that no company has ever offered before.
17e. Added a new feature to one of your goods or services.

Marketing Innovation
19a. Made significant changes to the design or packaging of a good or service other than changes that alter how it is used.
19f. Told customers about a new way they can use your company’s goods or services.

Not every respondent was asked the follow up question. Follow up questions were asked randomly.
Table 2
The proportion of responses that were defined as innovation
(Question numbers correspond to questions in Appendix A.)

As evident in Table 2 only Question 20c (started a new way of interacting with other firms or organizations) resulted in respondents offering a 'correct' example of innovation at least three quarters of the time. This suggests that even when the Oslo Manual definition of innovation is broken down and respondents are asked better defined yes/no questions, this is still not sufficient to classify business innovation.

A text analysis of the responses that were deemed 'correct' was also conducted. Text analysis or text mining examines the frequency and patterns of words used. The top ten words used in the responses deemed innovation are presented in Table 3. The most frequent words used are “new,” “software,” and “service.” The use of “new” is encouraging as it part of the Oslo Manual definition, but not surprising. However, these findings are at best suggestive at this point.

<table>
<thead>
<tr>
<th></th>
<th>Product Innovation</th>
<th>Process Innovation</th>
<th>Marketing Innovation</th>
<th>Organizational Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17a 17b 17c 17d 17e 17f</td>
<td>18a 18b 18c 18d 18e 18f</td>
<td>19a 19b 19c 19d 19e 19f</td>
<td>20a 20b 20c</td>
</tr>
<tr>
<td>0 - 25 %</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>26 - 50%</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>51 - 75%</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>76 - 100%</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Table 3
Top ten most frequently mentioned words in innovation responses

<table>
<thead>
<tr>
<th>new</th>
<th>offer</th>
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<tbody>
<tr>
<td>software</td>
<td>market</td>
</tr>
<tr>
<td>service</td>
<td>product</td>
</tr>
<tr>
<td>client</td>
<td>develop</td>
</tr>
<tr>
<td>use</td>
<td>design</td>
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</table>

NCSES plans to continue this area of research.

Next Steps
The findings reported in this paper suggest that another useful area for research on innovation metrics is to examine business case studies that report on company innovations. NCSES plans to review approximately 20 – 25 case studies that examine business innovation to answer the following questions:

- How do businesses measure innovation?
- How does a business manage innovation?
- How important is innovation management?
- Is there an innovation pipeline?
- Do businesses define innovation?
- What data do businesses have on innovation and how easily accessible is it?

A review of the traditional business case study literature could be very useful in identifying gaps in existing data and research.

In addition, NCSES is revising the MIST survey. The revised survey is renamed the Microbusiness Research & Development and Innovation Survey (Micro BRDIS). This survey will be conducted in partnership with the U.S. Census Bureau. The survey will include more industries than the MIST pilot survey did and will sample approximately 200,000 U.S. microbusinesses. The innovation questions on the Micro BRDIS survey have been revised, although the approach used in MIST (check-offs for different named activities) is also being used for Micro BRDIS. Data collection for Micro BRDIS is expected to start in February 2017.

Furthermore, the U.S. Census Bureau also conducts the Annual Survey of Entrepreneurs (ASE). The ASE provides estimates of number of firms, sales/receipts, annual payroll, and employment by gender, ethnicity, race, and veteran status. It collects data on entrepreneurs’ access to capital to conduct their business. Each year it introduces a data

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9 This analysis was conducted using [http://textalyser.net](http://textalyser.net).
10 [https://bhs.econ.census.gov/bhs/ase/about.html](https://bhs.econ.census.gov/bhs/ase/about.html)
collection module focusing on an important component related to business growth. For the 2014 reference year, the module selected covered innovation and R&D utilizing the questions from the MIST survey. For the 2015 reference year the module will address management practices. The ASE sample was approximately 290,000 non-farm businesses in the United States and included an extensive number of industries. The data from ASE should be available in late 2016 or 2017.
Appendix A

MIST Questionnaire
Dear Small Business Owner,

You are part of a vital but often unrecognized part of the economy – the small business community – and the National Science Foundation (NSF) wants to hear from you.

NSF is an independent federal agency tasked with examining U.S. competitiveness in science, engineering, technology, and R&D. We are surveying all types of businesses in the U.S. to measure the extent of innovation and research and development (R&D) activities in our nation. This survey focuses on the smallest businesses in the U.S. Your answers will help policymakers address issues such as how small businesses are affected by the rapid changes in our economy and what the smallest businesses are doing to be competitive.

Please return the completed questionnaire to the address below. A postage-paid envelope is provided for your convenience.

National Science Foundation  
c/o Westat, Room TA 2133  
1600 Research Blvd.  
Rockville, MD 20850

Your responses are confidential under law. See the statement at the bottom of this page for more details.

Contact Westat, our contractor, toll-free at 888-225-0236 OR by e-mail at MISTsurvey@westat.com.

Thank you for contributing to our study of our nation’s smallest businesses.

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide is protected under the NSF Act and Title 26, U.S. Code. Any information publicly released (such as statistical summaries) will be in a form that does not personally identify you or your company. Your response is voluntary and failure to provide some or all of the requested information will not in any way adversely affect you or your company. Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0237 (exp. Oct. 31, 2017). Public reporting burden for this collection of information is estimated to average 15 minutes per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne Plimpton, Reports Clearance Officer, Facilities and Operations Branch, Division of Administrative Services, National Science Foundation, Arlington, VA 22230.

A. OVERALL COMPANY INFORMATION

If you have more than one business, please answer only for the business named above.

1. Did your company have any revenues or grants in 2014?
   - Yes → Go to Question 2.
   - No → Go to Question 47.

2. Did another company own more than 50 percent of your company at any time during 2014?
   - Yes → Go to Question 47.
   - No → Go to Question 3.

3. How important to you are each of the following reasons for owning your company?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Very important</th>
<th>Somewhat important</th>
<th>Not important</th>
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</thead>
<tbody>
<tr>
<td>a. Wanted to be my own boss</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Flexible hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Opportunity for greater income</td>
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<td></td>
<td></td>
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<tr>
<td>d. Best avenue for my ideas/goods/services</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>e. Had to start company to find work</td>
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</tr>
</tbody>
</table>

f. Please list any other important reasons for owning your own company:
4. For the pay period including March 12, 2014, how many people worked for your company, including those paid through grants? Include both full-time and part-time workers as well as yourself. Please count each person only once.

Owners
- a. Owners who received a W-2 issued by your company for salary or wages
- b. Other owners (paid or unpaid)

Non-owners
- c. Employees who received a W-2 issued by your company for salary or wages
- d. Individuals who received payment in other ways (e.g., contractors/consultants/temporary workers who received a 1099 or payment from another company)
- e. Unpaid individuals who worked for your company (e.g., interns, friends, family members)

5. Not counting those listed in question 4, which of the following were key people you used as advisors for your company during the past year?

- a. Scientist or technical expert
- b. Financial expert or accountant
- c. Business expert
- d. Marketing expert
- e. Individual who offered general advice
- f. Legal, regulatory, or compliance expert
- g. Other (specify):

6. Did your company hire a full-time or part-time employee within the last three years?
- Yes  ➔ Go to Question 7.
- No  ➔ Go to Question 8.

7. Please answer the following about your most recently hired employee.

- a. He/she performs the same tasks we performed before hiring him/her.
- b. We hired him/her to get skills we otherwise would not have had.
- c. We hired him/her to take over certain tasks.

8. What year did your company start? Give the year your company first obtained an EIN (Employer Identification Number) or first filed a tax return, whichever is earlier. Please answer for the firm identified.

Year company started

9. Please give a brief description of your company’s industry.

B. FINANCIAL INFORMATION

10. What were your company’s 2014 revenues, including income from grants? Please round to the nearest one thousand dollars. Your best estimate is fine.

$ 000 2014 revenues and grants

11. Approximately what share of your company’s 2014 revenues and grants came from the following? If none, enter zero; total should equal 100%.

- a. Selling goods to customers, including other companies
- b. Selling services to customers, including other companies
- c. Income from grants
- d. Other (specify):

<table>
<thead>
<tr>
<th>Percentage of Revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Selling goods to customers, including other companies</td>
</tr>
<tr>
<td>b. Selling services to customers, including other companies</td>
</tr>
<tr>
<td>c. Income from grants</td>
</tr>
<tr>
<td>d. Other (specify):</td>
</tr>
</tbody>
</table>

TOTAL 100%

12. Approximately what percent of your revenues for 2014, excluding grants, were from customers in the United States and its territories? If none, enter zero.

% Percent of revenues
13. In 2014, did your company earn any revenue from customers in the following locations?  
   a. Within your state  
   b. Other states or U.S. territories  
   c. Canada or Mexico  
   d. Other countries  

14. During 2014, did you use any of your personal funds (e.g., credit cards, home equity loan, personal savings) for your company?  
   Yes  
   No  

15. During 2014, did your company try to get funding (e.g., loans, investments, or gifts) from the sources in the list below?  
   Yes, tried but did not get funding  
   No, did not try  
   a. Banks or credit unions  
   b. Other companies as investors  
   c. Family and friends  
   d. Angel or venture capital funding (financial support in return for equity or stock in your company)  
   e. Federal government’s Small Business Technology Transfer Program (STTR) or Small Business Innovation Research Program (SBIR)  
   a. Other (specify):  

17. During the last three years, did your company do each of the following regarding the goods or services your company offers? Do not include adaptation or customization of your company’s goods or services for a specific client’s needs.  

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Offered a new good or service that no company has ever offered before</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>Offered a new good or service that your company has never offered before</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Improved good’s performance by making changes in materials, equipment, components, or software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>Developed a new use for one of your goods or services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>Added a new feature to one of your goods or services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td>Made it easier for customers to use one of your goods or services (e.g., easier access, more user friendly)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18. During the last three years, did your company do each of the following regarding the goods or services your company offers?  

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Used a new way of purchasing, accounting, computing, maintenance, inventory control, or other support activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>Reduced costs by changing the way you distribute one of your goods or services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>Upgraded techniques, equipment, or software to significantly improve the goods or services you offer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>Made significant improvements in techniques or processes by increasing automation, decreasing energy consumption, or using software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>Decreased production costs by improving the materials, components, or software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td>Changed methods to deliver your company’s goods or services faster or more reliably</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. INNOVATION

16. Did your company sell any goods or offer any services during the last three years?  
   Yes  
   No  

   Continue with Question 17 in the next column.  
   Go to Question 20.
19. During the last three years, did your company do each of the following related to marketing or design?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Made significant changes to the design or packaging of a good or service other than changes that alter how it is used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Promoted your company’s goods or services in a new way (e.g., the first time use of a new type of advertising, a new brand image, introduction of loyalty cards)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Used new ways to sell your company’s goods or services (e.g., first time use of franchising or distribution licenses, direct selling, exclusive retailing, new concepts for presentation of your goods or services)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Used new pricing methods (e.g., first-time use of pricing by demand, discount system)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Created or opened up a new market for your company’s goods or services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Told customers about a new way they can use your company’s goods or services</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. During the last three years, did your company do each of the following related to your organization?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Implemented new methods to improve internal processes or deliver goods or services (e.g., introduce supply chain management systems or business re-engineering, lean production and quality management systems)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Applied new methods or processes to improve workplace organization (e.g., education and training systems to improve learning and sharing, implement changes in workplace responsibilities or authority of managers and employees)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Started a new way of interacting with other firms or organizations (e.g., alliances, partnerships, outsourcing, subcontracting)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D. INTELLECTUAL PROPERTY

21. How many U.S. patent applications, if any, does your company currently have pending? If none, enter zero.

[Number of patent applications currently pending]

22. How many U.S. patents does your company currently own? If none, enter zero.

[Number of patents owned]

23. Please indicate whether or not your company did each of the following during the last three years.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Transferred intellectual property (IP) to others not owned by your company through participation in technical assistance or “know how” agreements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Received IP from others not owned by your company through participation in technical assistance or “know how” agreements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Participated in cross-licensing agreements in which two or more parties grant a license to each other for the use of the subject matter claimed in one or more of the patents owned by each party</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Allowed free use of patents or other IP owned by your company (e.g., allowing free use of software patents by the open source community)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Made use of open source patents or other freely available IP not owned by your company</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
24. During the last three years, how important were the following for protecting your company’s intellectual property? Mark one for each row.

<table>
<thead>
<tr>
<th>Option</th>
<th>Very important</th>
<th>Moderately important</th>
<th>A little important</th>
<th>Not at all important</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Utility patents (patents for inventions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Design patents (patents for appearance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Trademarks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Copyrights</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Trade secrets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Nondisclosure agreements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Other (specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

25. During 2014, did your company do any of the following R&D activities? Include activities that:
- Your company performed
- Others paid your company to do
- Your company paid others to do

<table>
<thead>
<tr>
<th>Activity</th>
<th>Yes</th>
<th>No</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Conducted work that might lead to a patent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Developed and tested prototypes that were derived from scientific research or technical findings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Produced findings that could be published in academic journals or presented at scientific conferences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Applied scientific or technical knowledge in a way that has never been done before</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Created new scientific or technical solutions that can be generalized to other situations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Conducted work to discover previously unknown scientific facts, structures, or relationships</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Conducted work to extend the understanding of scientific facts, relationships or principles in ways that could be useful to others</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26. Did you answer “Yes” to any activities in Question 25?  

- Yes  ➔ Continue with Question 27 in the next column.  
- No  ➔ Go to Question 33.

27. What was the total cost in thousands in 2014 for all the R&D activities you answered “Yes” to in Question 25? Your best estimate is fine. Please include all costs:
- Salaries, wages, fringe benefits
- Equipment, materials, supplies, software
- Rent, utilities
- Consultants, contractors

   Total cost for R&D activities reported in Question 25 for 2014

   $ _000

28. How much of the amount in Question 27 was for purchasing R&D services from others? Your best estimate is fine.

   Costs of R&D services purchased from others

   $ _000

29. To calculate the costs of R&D services you performed, please subtract Question 28 from Question 27 and enter the amount here.

   Costs of R&D services you performed

   $ _000

30. Of the total R&D amount you reported in Question 29, what percent was for each of the following types of costs?

   a. Salaries, wages, and fringe benefits for company’s employees
   b. Equipment
   c. Software purchases and licenses
   d. Other costs (e.g., consultants, contractors, travel, rent)

   TOTAL 100%
31. Of the total R&D amount you reported in Question 29, how much was paid for by the following sources?

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Your company</td>
<td></td>
</tr>
<tr>
<td>b. Another U.S. company</td>
<td></td>
</tr>
<tr>
<td>c. U.S. university or college</td>
<td></td>
</tr>
<tr>
<td>d. U.S. non-profit organization</td>
<td></td>
</tr>
<tr>
<td>e. U.S. Federal government (including R&amp;D grants)</td>
<td></td>
</tr>
<tr>
<td>f. U.S. state or local government (not including state universities)</td>
<td></td>
</tr>
<tr>
<td>g. Other (specify):</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL 100%

32. How many people worked on the R&D activities you reported in Question 25 for the pay period that included March 12, 2014?

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Owners</td>
<td></td>
</tr>
<tr>
<td>b. Employees who received a W-2 issued by your company for salary or wages</td>
<td></td>
</tr>
<tr>
<td>c. Other paid workers (e.g., contractors, consultants, temporary workers)</td>
<td></td>
</tr>
<tr>
<td>d. Unpaid workers</td>
<td></td>
</tr>
<tr>
<td>e. Total</td>
<td></td>
</tr>
</tbody>
</table>

F. YOUR COMPANY STRATEGIES

33. How important is each of the following in how your company seeks a competitive advantage?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Very important</th>
<th>Moderately important</th>
<th>A little important</th>
<th>Not at all important</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Your low prices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. The quality of your goods/services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Your unique goods/services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. The convenience you offer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Your reputation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Other (specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

34. How important is each of the following to your company’s strategy?

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Very important</th>
<th>Moderately important</th>
<th>A little important</th>
<th>Not at all important</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Updating or improving an existing good or service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Developing a good or service that will save customers’ money</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Developing a good or service that will improve current customers’ experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Having a formal business strategic plan in writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Partnerships with other businesses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Partnerships with one or more universities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Providing individualized goods or services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
35. During 2014, how important was each of the following in moving your company forward?

<table>
<thead>
<tr>
<th>Importance Level</th>
<th>a. Cutting costs enough to make a profit</th>
<th>b. Keeping up with demands for your goods or services</th>
<th>c. Finding new customers</th>
<th>d. Keeping current customers</th>
<th>e. Finding people with the right job skills</th>
<th>f. Getting access to funds</th>
<th>g. Getting access to facilities and equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very important</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Moderately important</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>A little important</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Not at all important</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Does not apply</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

36. Where would you like your company to be in five years? Check all that apply.

- [ ] Company will have a larger number of employees
- [ ] Company will have about the same number of employees as it has currently
- [ ] Company will be purchased by another company
- [ ] Uncertain
- [ ] Other (specify):

G. ABOUT THE OWNER

If your company has more than one owner, answer for the owner with the most responsibility for the direction of the company.

37. Approximately, how many hours each week do you work at this company? Include all hours whether paid or unpaid.

[ ] Number of hours

38. Is this the first company you started?

- [ ] Not applicable: I did not start this company
- [ ] Yes
- [ ] No  Go to Question 40.

Go to Question 39.

39. Not including the company discussed in this questionnaire, what is the status of the company you started most recently?

- [ ] Yes
- [ ] No

<table>
<thead>
<tr>
<th>Status</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Company is still in business and I still own it</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>b. Company is no longer in business</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>c. Company was purchased by another company</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>d. Company was purchased by another individual</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>e. Other (specify):</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

40. What is the highest level of education you completed?

- [ ] Less than high school
- [ ] High school graduate
- [ ] Some college
- [ ] Bachelor's degree
- [ ] Master's degree
- [ ] Professional degree (e.g., JD, LLB, MD, DDS, DVM)
- [ ] Research doctorate (e.g., PhD, DSc, EdD)
- [ ] Other (specify):
41. What was the major field of study for your highest degree?

- Business management/administration
- Communication
- Computer science
- Education (includes research and administration, and teaching)
- Engineering
- Humanities (includes history, foreign languages and literature, and letters)
- Life sciences (includes agricultural sciences/natural resources, biological/biomedical sciences and health sciences)
- Mathematics
- Physical sciences (includes astronomy, atmospheric science and meteorology, chemistry, geological and earth sciences, ocean/marine sciences, and physics)
- Psychology
- Social sciences
- Other (specify):

42. Are you Hispanic or Latino?

- Yes
- No

43. What is your race? Please select one or more.

- American Indian or Alaska Native
- Native Hawaiian or other Pacific Islander
- Asian
- Black or African-American
- White

44. Are you male or female?

- Male
- Female

45. Where were you born?

- Inside the U.S.
- Outside the U.S.

46. Are you a U.S. citizen?

- Yes
- No

H. CONTACT INFORMATION

47. Please provide the following information for the person we may contact regarding the answers to this survey.

Name

Title

Name of business

Telephone

Extension

Fax

Extension

E-mail address

48. Enter any comments below.

Thank you for your participation in this survey.

Please return your completed questionnaire to:

National Science Foundation
 c/o Westat, Room TA 2133
 1600 Research Blvd.
  Rockville, MD 20850.
Appendix B

Industries covered by the MIST Pilot Test
## Industries Covered by the MIST Pilot Test

<table>
<thead>
<tr>
<th>2012 NAICS code</th>
<th>2012 Principal Business Activity description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3254</td>
<td>Pharmaceutical and Medicine Manufacturing</td>
</tr>
<tr>
<td>3255</td>
<td>Paint, Coating, and Adhesive Manufacturing</td>
</tr>
<tr>
<td>3259</td>
<td>Other Chemical Product and Preparation Manufacturing</td>
</tr>
<tr>
<td>332</td>
<td>Fabricated Metal Product Manufacturing</td>
</tr>
<tr>
<td>3336</td>
<td>Engine, Turbine, and Power Transmission Equipment Manufacturing</td>
</tr>
<tr>
<td>3344</td>
<td>Semiconductor and Other Electronic Component Manufacturing</td>
</tr>
<tr>
<td>3345</td>
<td>Navigational, Measuring, Electromedical, and Control Instruments Manufacturing</td>
</tr>
<tr>
<td>335</td>
<td>Electrical Equipment, Appliance, and Component Manufacturing</td>
</tr>
<tr>
<td>3391</td>
<td>Medical Equipment and Supplies Manufacturing</td>
</tr>
<tr>
<td>5112</td>
<td>Software Publishers</td>
</tr>
<tr>
<td>519</td>
<td>Other Information Services</td>
</tr>
<tr>
<td>5413</td>
<td>Architectural, Engineering, and Related Services</td>
</tr>
<tr>
<td>5415</td>
<td>Computer Systems Design and Related Services</td>
</tr>
<tr>
<td>5416</td>
<td>Management, Scientific, and Technical Consulting Services</td>
</tr>
<tr>
<td>5417</td>
<td>Research and Development</td>
</tr>
<tr>
<td>5419</td>
<td>Other Professional, Scientific, and Technical Services</td>
</tr>
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