

Milwaukee 7 CEO Call Program

Biomedical CEO Call Analysis

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Special thanks to the biomedical CEOs who took the time to respond to our many questions and to the interviewers who asked those questions.

Introduction

Biotechnology is continuously in the news. It is often spoken of as the next great industry in the US. Virtually every state in the nation has a biotechnology initiative of one kind or another. Wisconsin is on the band wagon. UW-Madison and Dane County have already benefited from interest in this area, and more is certain to happen.

But before we add to the frenzy, we should realize that this is a field in its infancy. It receives a good deal of press and some extremely promising products and solutions are being announced. But readers should not expect miracles in employment generation just because of the buzz around developments in the industry. Since 2000, the biotechnology industry in all of the US has generated only 19,000 new jobs in a national economy of 146 million jobs. Biotechnology requires vast amounts of capital. Its labor is highly technical. False-starts and failure are common. Success is difficult to achieve.

A big question for the Milwaukee region is to what degree can and should it become a player in biotechnology. Much has been written in the press about how far Milwaukee is behind Madison in this regard, but that may not be as true as some contend. In a recent report on bioscience by the Battelle Institute, in 2004 Madison had 1,458 workers in one segment of this, the drug and pharmaceutical industry, while Milwaukee had 1,011 workers.

Furthermore, the same study notes that Milwaukee's overall bioscience industry is far smaller than that found on either coast. Milwaukee's bioscience employment is one-tenth the size of the New York/New Jersey metro area and one-sixth the size of the Los Angeles/Long Beach/Santa Ana metro area. But Milwaukee is 12th on a list of cities with a medical device and equipment concentration (measured in terms of employment). That figure alone suggests that there is likely to be a future for bio-tech in the Milwaukee 7 region, as there is already a start. In fact, overall Milwaukee's 2004 employment in the four sectors of bioscience was 10,605, ranking metropolitan Milwaukee 23rd among metropolitan areas with the largest total employment levels in the biosciences. More than half of that employment can be attributed to GE Healthcare, but the fact is that firm is headquartered in the region.

Bioscience is an encompassing term. It includes such general areas as Agricultural Feedstock and Chemicals, Drugs and Pharmaceuticals, Medical Devices and Equipment, and Research, Testing and Medical Laboratories. The term used for the CEO Call Program is biomedical. That is still quite broad. It includes such industries as Surgical & Medical Instruments and Apparatus, Testing Laboratories, Organic and Inorganic Chemicals, and Commercial Physical & Biological Research to name a few. But it also includes computer programming services and computer services, not elsewhere classified, if they pertain to the biomedical field. It also includes management services, commercial research, and even schools and educational services, not elsewhere classified. The single theme was that the firms were somehow involved in biomedical activities either directly or as support.

If a geographic region has a large number of firms in biomedical, then it is likely that examples of these many industries exist and interaction among them also exists to at least some degree. That might then create an industry cluster and gain the asserted benefits of such a cluster.

To date that is not the situation in the Milwaukee 7 region. In fact, with 28 firms reporting their four-digit industries, they represent 20 different industries. No more than three businesses locally are in the same industry. This variety and the small absolute number of firms in the seven counties that were initially identified as being biomedical (71) caused one respondent to remark: “There is no biomedical industry here – it is just a few individuals who are attempting to learn some clues from science that we can commercialize.”

That may be a bit of an overstatement, but it is not far from the current truth. Some 52% of the responding firms have fewer than 10 employees; 70% have fewer than 20 employees; and 94% have fewer than 100 employees. Aside from the 6% with high levels of employment, employment in biomedical is miniscule when compared to that in the region. A true biomedical industry has yet to form in the Milwaukee 7 region beyond a couple of large firms.

Yet there is action and excitement in biomedical broadly defined. Discoveries are being made, and valid attempts at commercialization are following. Some firms are absolutely on the cutting edge of science and medicine. They have intellectual property that may well be breakthroughs in their respective fields. But the efforts are not moving forward at the pace firm leaders desire. That is a condition that should be addressed, if biomedical is to become a larger concentration of firms and workers in the Milwaukee 7 region.

There are many points that have been learned through the Milwaukee 7 CEO Call Program. The rest of this report attempts to reveal the many insights that leaders in this field were willing to share. Milwaukee 7 should pay heed and attempt to address the many points that have been made. Though the industry, with a couple of exceptions, is largely emerging at this point, with proper encouragement, there is potential for notable contributions to the Milwaukee 7 regional economy.

The Process. In the summer of 2006 a list of actors in the broadly defined biomedical field in Southeast Wisconsin was assembled. Some 71 firm names appeared on this list. The list was a bit broader than normal in that it included a few software firms that are focused on biomedical issues and a variety of service firms that offer applications of technology.

Interviews were begun in the fall of 2006 and completed in early February 2007. The interviews were conducted by a group of volunteers and by staff from the Milwaukee Development Corporation. Each consenting firm was sent a pre-meeting survey that they completed prior to a personal interview. The pre-meeting survey contained a number of quantitative questions on such topics as firm size, number and pay of various types of workers, expected changes in employment, difficulty attracting and retaining different types of workers, rating of various components of the regional business climate, and so forth. The personal interview asked more qualitative questions on the impact of the region on their businesses, business climate, workforce, more detailed sales information, and technology. Copies of these questionnaires are found in Appendix A.

The responses were all entered into a data base. These were subsequently analyzed and written up in this report.

The Firms: Who They Are

Number of Firms. Some 71 firms were originally identified in the Milwaukee 7 region as being considered in the biomedical arena. By the time interviews were requested that number had dropped to 68, as three businesses closed. The remaining 68 firms were contacted. Interviews were conducted with 37 for a very credible 54% completion rate.

Industries. The firms included under biomedical range from the very visible GE Healthcare that produces medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery and biopharmaceuticals to very small firms that provide products and services in the very sophisticated biomedical world. One firm produces accurate, three-dimensional physical models of proteins and other molecular structures. A second provides molecular biology reagents for biotechnology and pharmaceutical companies. A third produces biochemical and organic chemical product kits used in scientific and genomic research, biotechnology and pharmaceutical development.

Other small firms produce products such as diagnostic tests for infectious diseases, a substance used for coating artificial joints, brain imaging technology, dental equipment, and a variety of medical devices. Services provided also include analytical lab testing of water, waste water, soils, oils and fuels, portable X-ray and EKG services, clinical trial support services, and chemistry services.

If we try to identify common themes, two stand out: magnetic imaging in its various formats and biochemistry. At least eight of these firms are involved in developing, enhancing, producing, and using magnetic imaging technology. At least five firms are involved in biochemistry. In addition, several are creating health-care products. A handful of firms is linked closely to the support of biomedical research.

A quick listing of the industries represented appears in Table 1. These are the formal industry titles. They may not have much meaning, given the niches most of these firms fill. But the list gives another way to view the variety that is represented in Southeast Wisconsin. All are not technically biomedical, but they were included because they interact with this area.

Table 1: Biomedical Industries Located in Southeast Wisconsin

<u>SIC Code</u>	<u>Industry Title</u>
2819	Inorganic Chemicals
2869	Industrial Organic Chemicals, Not Elsewhere Classified
2899	Chemicals and Chemical Preparations, Not Elsewhere Classified
3069	Fabricated Rubber Products, Not Elsewhere Classified
3674	Semi-Conductors & Related Products
3823	Industrial Instruments for Measurement, Display, & Control
3841	Surgical & Medical Instruments and Apparatus
3843	Dental Equipment & Supplies
3844	X-Ray Apparatus & Related Irradiation Apparatus
5047	Wholesale Medical, Dental & Hospital Equipment
5084	Wholesale Industrial Machinery & Equipment
7371	Computer Programming Services
7379	Computer Services, Not Elsewhere Classified
8071	Medical Laboratory Services
8099	Health & Allied Services, Not Elsewhere Classified
8299	Schools and Educational Services, Not Elsewhere Classified
8731	Commercial Physical & Biological Research
8732	Commercial Economic, Sociological & Educational Research
8733	Non-Commercial Research Organizations
8734	Testing Laboratories

Characteristics of Firms' Biomedical Intellectual Property. Before attempting to describe some of the actual intellectual property (IP) of the firms interviewed, it would be useful to learn just how important developing IP is to them. Toward that end each respondent was asked to rank on a scale of 1 (not at all important) to 5 (very important) just how important developing IP is to their respective companies' futures. The results appear in Table 2.

Table 2: Relative Importance of Developing Intellectual Property to Firm Future

<u>Rating</u>	<u>Frequency</u>	<u>Percent</u>
5	22	69
4	1	3
3.5	1	3
3	2	6
2	3	9
1	3	9
Total	32	99*
Average	4.14	

Blank 5

** Rounding error*

5 = Very important; 1 = Not at all important

For about two-thirds of the respondents, developing IP is very important. If this group of firms had been more narrowly drawn, the percentage would likely have been even higher. But since some of the firms included are service firms, we would expect a few firms to be at the other end of the spectrum. That is the case: some 20% gave a 1 or 2 to their response, indicating that developing IP is not a high priority. But overall the average is 4.14, indicating that IP is important, on average, across these firms.

Since a listing of firms is not likely to give many readers insights into what these firms do, we next review a question asked all firms: what is the character of your firm's intellectual property? Most of the firms responded. Some made very general statements, such as they have products or processes. But several were more specific. Few of their statements will be sufficiently descriptive that the uninitiated reader will fully understand what it is these firms do. Some discussion should help.

The responses of 31 of 32 firms that talked of their IP have been divided into four categories. One is processes. Six firms just mentioned "processes," but several others were more specific. One firm has a process for cloning things that others cannot. A second has a process for the manufacturing of 3D models. A third talked of having the understanding behind various chemical processes.

Almost half of firms revealed that their IP was either devices or products. For the most part, these were not revealed. Instead they talked of the number of patents they held. But a few talked of such products as a patented wound care product, dental and medical innovations, medical devices, medicine delivery systems, and devices related to Electron Paramagnetic Resonance and Nuclear Magnetic Resonance. Products and devices are the major part of biomedical in the Milwaukee 7 region.

Several firms are involved in services, often services one would not immediately associate with biomedical. These include such items as billing systems, internal data systems for the lab, trade secret protection, digital medical imaging, and web-based monitoring of regional emergency services. That is quite a mix of service provided.

The remaining firms basically said that what they did was proprietary. The message was sometimes direct but more often hidden by saying the IP is very complicated. Needless to say, the majority of the firms is very involved in the development and application of IP.

Firm Size. As was noted in the introduction, the vast majority of the biomedical firms in the Milwaukee 7 region are small (Table 3). Some 52% have fewer than ten employees and 70% have fewer than 20. On the other hand, two of the firms interviewed had more than 500 employees in the region, which quickly establishes the validity of focusing on this sector.

Table 3: Employment Distribution of Biomedical Industries At This Site

<u>Employees</u>	<u>Frequency</u>	<u>Percent</u>
10 or fewer	17	52
11 - 20	6	18
21 - 50	6	18
51 - 100	2	6
101 - 500	0	0
501+	2	6
Total	33	100
Blank	4	

Firm Age. Most of the firms are young. In fact, two-thirds of the firms reported starting in 1995 or later (Table 4). Twenty-six percent of the firms report being started in 1994 or earlier, most since 1979. Two firms (7%) reported that they opened in 1900 or before. That is truly the exception. The more recent starting dates help to explain the modest employment numbers. Also contributing to modest employment is the nature of the industry: it is often very capital intensive.

Table 4: Year That Firm Started

<u>Years</u>	<u>Percent</u>
1900 or before	7
1901 - 1984	7
1985 - 1994	20
1995 - 2000	23
2001 - 2006	43
Total	100
Blank	7

Annual Sales. One current measure of these firms is their annual sales. The majority were reluctant to share this information. But about one-third did. Their estimates appear in Table 5. Just over two-fifths of the reporting firms have sales of \$1 million or less. If we add in the firms that said that they had no sales to date, the result is over two-thirds of these firms have sales of \$1 million or less. About two-fifths have sales of \$1 million to \$10 million. Thus, with a few exceptions, the sales volumes to date are modest. That may change for some; a few others are serving very niche markets that are not likely to greatly expand.

Table 5: Annual Sales of Biomedical Firms

<u>Sales Categories</u>	<u>Frequency</u>	<u>Percent</u>
Less than \$500,000	2	17
\$500,000 to \$1 million	3	25
\$1,000,001 to \$10 million	5	42
\$10,000,001 to \$100 million	1	8
\$100,000,001 to \$1 billion	0	0
Over \$1 billion	1	8
Total	12	100
Blank	25	

A related issue is the degree to which sales are to firms outside the region. This is a measure of the power of biomedical as a regional income multiplier. The greater proportion of sales outside the region, the more the industry contributes new dollars to the regional economy. As one might guess, given the nature of the industry, the respondents make only five percent of their sales, on average, within the region. About 80% of sales are to customers elsewhere in the US, and 15% are to customers in other countries.

Location of Operations. Given the modest employment and sales of most of these responding firms, it may seem silly to ask. But an issue is the degree to which these respondents are located exclusively in the facility in which they were interviewed or whether they range more widely. Obviously, a firm like GE Healthcare has worldwide connections and operations. But what of the other firms; do they operate on a larger scale?

The biomedical firms in the Milwaukee 7 region are largely self-standing businesses. Some 88% of them are headquartered here. But several have more than one facility. Table 6 reveals the responses to the question on where their operations are located. Most firms did respond. Over two-thirds have one location. But the other third vary from having other operations in the seven counties to having other operations in the Milwaukee 7 region as well as outside the region. These firms are not exclusively new starts confined to a single site. About 80% are totally housed in the Milwaukee 7 region. With few exceptions (6%), these firms are very much regionally based.

Table 6: Location of Company's Operations

<u>Location Options</u>	<u>Frequency</u>	<u>Percent</u>
All company operations are housed at this site	22	65
Additional operations located inside 7-county region	4	12
Additional operations located outside the region	3	9
Additional operations located inside AND outside region	5	15
Total	34	101
Blank	3	

Links to Colleges and Universities. One topic that is increasingly in the news is that of the generation of IP in colleges and universities and the movement of that IP to the commercial sector. The Medical College of Wisconsin and UW-Madison have gained strong reputations on their ability to commercialize the discoveries made on their respective campuses. UW-Milwaukee is working hard at replicating the others' experience.

An issue for the Milwaukee 7 is to what degree the biomedical firms that exist here have roots in the local colleges and universities. It may surprise some readers to learn that almost one-third of the firms interviewed were derived from colleges and universities (Table 7). The leading source locally is the Medical College of Wisconsin. But also appearing are MSOE, UWM, and UW-Madison. The hope for the region is that the number of firms with ties to these institutions will grow rapidly, as the infrastructure for such transfers is refined and as more faculty and staff think about the commercialization of their ideas.

Table 7: Spin-off from College or University

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Yes	11	32
No	23	68
Total	34	100
Blank	3	

The Workforce. With the heavy scientific emphasis, one would expect these firms to be populated by a high proportion of technical workers, scientists, and software writers. That appears to be the case (Table 8). Almost half of all employees, on average, are technical or professional. Also, since so many of these firms are small, one would expect a higher proportion of workers to be managerial and supervisory. That is also the case (23%). With several firms still in developmental mode, one might guess that marketing and sales are not found in large numbers. That is true (8%).

Table 8: Average Percent of Workforce in Job Classifications

<u>Classification</u>	<u>Ave. Percent</u>
Technical	46
Professional	3
Managerial and supervisory	23
Marketing/sales	8
Clerical and administrative support	6
Skilled workers	12
Unskilled workers	5
Total	103*

n = 28

* *Rounding error*

Wages Earned. With relatively few clerical and unskilled workers, it is likely that average wages are higher than is common in many older industries. That appears to be the case (Table 9). There is a sharp contrast with manufacturing, for example, in that average wages across all job classifications are higher in biomedical. In occupations such as skilled workers, biomedical workers earn only pennies more per hour, on average. But for technical workers and managers and supervisors the differences are dramatic. Management and supervisory workers in biomedical have wages that are 50% higher than those reported by area manufacturers in the 2006 Call Program. A major reason for this is that the managers in biomedical are often the business owners as well. Furthermore, the risks of being involved in this industry are much greater than the risks in most manufacturing. And the potential rewards from the application of science are often much greater than those from many facets of manufacturing.

The main point from such an examination is that this industry does yield good incomes regardless of the occupation. It is a desirable industry to have in the region because of the incomes it generates. If the region is seeking to grow “family supporting” jobs, then this certainly qualifies as an avenue worth pursuing.

Table 9: Average Hourly Wage by Job Classification

<u>Classification</u>	<u>Avg. wage (\$)</u>	<u>n</u>
Managerial and supervisory	67.86	16
Marketing/sales	52.99	12
Professional	43.81	6
Technical	37.65	18
Clerical and administrative support	21.53	13
Skilled workers	18.18	9
Unskilled workers	14.38	6

Facility Needs and Conditions. As is common in a call program that seeks to learn of company needs and plans, respondents were asked several questions about their physical space. One of the questions asked was whether the space was owned or rented. With a number of start-ups in the pool of firms, 64% of the respondents rent, as would be expected.

The majority of the firms, regardless of tenure, seem to have procured about the right amount of space: 62% utilize 76-100% of the space they own/lease. Some 77% of all respondents, however, report that they have room for expansion. What is more surprising is that 28% of responding firms use between 1% and 25% of the space they control. That suggests plans for growth, over-optimism, or good deals on space.

In looking to the future, firms were asked if they were likely to need additional “wet-lab” space in the next 12 months. This opens the window for more development. What is good news for the region is that 23% of the respondents indicated that they indeed will need more wet-lab space in the next year.

Firms were additionally asked if they expect to relocate within the next 1 to 3 years. One quarter of the firms indicated that they did plan to relocate. Fortunately, 88% of those firms indicated that they would stay within the Milwaukee 7 region. Thus, those talking of the need for additional space are very likely to stay within the seven counties.

Role of the Region

Positive Impact of the Region on the Firm. Firms were asked a somewhat ambiguous question: What makes your company successful here? The intent was to force the company leaders to assess just what competitive advantages, if any, being located in the Milwaukee 7 region provided. Most interviewees responded.

Table 10: Reasons for Success in Milwaukee 7 Region

<u>Factors Making Company Successful Here</u>	<u>Percent</u>
Workforce characteristics	24
Close ties to colleges/universities	19
Special firm conditions	18
Market conditions	13
Low costs of doing business here	8
Many local sub-contractors	6
Assorted others	<u>12</u>
Total	100

n = 36

Three types of responses dominated (Table 10): workforce characteristics (24%), close ties to local colleges and universities (19%) and special firm conditions (18%). Many firms were also very positive about the influence of the local workforce on their success. There are still some shortcomings, as will be discussed below. But there are many benefits derived from the local workforce. A number of firms talked either about there being a critical mass of medical technology and people who understand that technology in the region or there being skilled, experienced workers with industry knowledge here. Respondents noted such strengths as, “good supply of entry-level scientists (workforce attitudes are great);” “workforce below the PhD level is available and excellent quality;” “entrepreneurial workforce;” and we “can attract the right talent.” Others made such statements as, “Our people: they’re qualified, dependable, and have previous experience,” “Significant software skill set,” and “There is a decent talent pool from which to choose.” Our workers are “creative,” “nimble,” and “hard-working.” These sentiments were not universally shared, but they were often mentioned.

Several of the biomedical firms derived, either directly or by license, their IP from local educational institutions. A handful of firms were started by current faculty at these institutions, and in a few cases the firms are still based on university property. Additional firms cited other types of ties to educational institutions. These include access to individual expertise, access to students and graduates, access to specific research, and access to new ideas. It is clearly important to at least one-fifth of these firms that the Milwaukee 7 region be populated by research-oriented colleges and universities.

Another real plus for the region was the comment by several firms that they experienced a low cost of doing business in the Milwaukee 7 region. Different respondents referred to the low cost of living, low overhead costs, low rent, low land costs, low insurance cost, and the low salaries for biochemists compared to the coasts. Employers also spoke of the Midwest work ethic and how such employees contributed.

About one-fifth of the respondents referred to some firm-specific condition that they thought contributed to their success in the Milwaukee 7. These included such things as their having a barrier to entry in their industry (limiting their competition), a unique leader, a large inventory, their management team, an attractive business model, and a good product that is reasonably priced relative to others in the market. Another stated the advantage was access to expertise in nearby Chicago. And one spoke of the advantage of being near its venture capital financier. Additionally, those involved in manufacturing or biotech research have found area sub-contractors who are of high quality.

The list goes on. One more point should be noted, and that is the role of the state commitment to the development of life sciences/biotech in the state. The firms greatly appreciated this commitment.

Not all firms share the same view of the reasons for their success. But all but one firm could find one positive regional attribute that they thought contributed to their success. And many firms agreed on certain elements that can be used to further build this sector.

Challenges to the Firms in the Region. Having been given the opportunity to assess what has contributed to their company success, firm leaders were asked what they saw as the top three challenges they faced at their current location. The region was implied in the question, but not

all respondents picked up on that. Some of the responses cover elements that are not unique to the region, such as FDA approval. Nevertheless, their many responses are revealed in Table 11.

Table 11: Challenges Facing the Biomedical Companies in the Milwaukee 7 Region

<u>Factors Challenging Company Here</u>	<u>Percent</u>
Workforce with needed skills	39
Company specific challenges	21
Getting capital needed to grow	20
Regional failings	12
Assorted other reasons	9
Total	101*

n = 37

* *Rounding error*

Many different challenges were named. Two types, access to workforce with needed skills and access to capital, were the most commonly cited themes. Others were mentioned much less frequently. To clarify, “Company specific challenges” are challenges mentioned by but one or two firms; to aid in reporting the single responses are aggregated in the table.

The most common challenge was being able to attract a workforce with the skills needed for the positions that the firms would create. The skills needed vary widely. On one end of the spectrum are firms that mentioned the difficulty accessing engineers and marketing talent; two spoke of finding good technical, scientific people, and others mentioned finding good, entry-level scientists (chemists), registered X-ray technicians, and computer programmers. One firm talked about the difficulty finding sales people who have both technical competence and sales/marketing knowledge. The individuals sought are true knowledge workers that several firms had difficulty locating, despite what some firms said in response to the first question.

As respondents listed more workforce challenges, what they mentioned more often were some specific issues with attracting scientists and management with industry experience. Several noted there is a lack of managerial talent in the region for a complex, scientific business. This will be heard in IT as well, but it is more common in biomedical. One firm also mentioned the difficulty of attracting seasoned talent to assist in business start-up.

On the other end of the spectrum, some employers mentioned finding labor or qualified labor or both skilled and unskilled workers, or vague descriptors. A couple mentioned trying to find manufacturing workers is challenging, and that they are working very hard to maintain production in light of worker shortages. The firms feel challenged by workforce issues but were not very specific as to what that really meant.

Those that mentioned access to capital expressed their frustrations in various ways. The basic issue is that they are in an industry that usually requires higher levels of capital, and they struggle in the Milwaukee 7 region to find sources to meet their needs. Many did not give reasons, but a

couple indicated that they thought financiers did not understand bioscience. Another thought it was because the industry was not suited to conventional lending. The argument was made that California has much more experience, and access to capital would be much easier there. In any event, whether it was the first, second, or third response, some biomedical firms are challenged to get the level of financing they think they need.

A related topic was the challenge of fostering a greater “giveback” mentality among those individuals who have made money in the region. More such individuals need to be persuaded to become business angels and help others with ideas to launch their firms.

The third most common response was company specific challenges. This is a catch-all for a range of individual problems. These include locating a “stinky” chemical plant, finding business service providers who will take equity in lieu of cash, modernizing a facility, determining how to better face global competition, fighting for Medicare reimbursement, overcoming a poor licensing agreement, addressing a declining nursing-home market, contending with international regulations, and reducing the difficulty of selling into local markets. Such are real challenges.

Heard more often than the singular challenges were such challenges as finding their markets, overcoming the image that the region is not a technology “hot spot,” handling high health-care costs, and building a critical mass here of similar companies. Several of these items face most firms, but they were mentioned infrequently in response to this question.

Regional failings were the next most commonly cited challenge. The region was said to lack a critical mass of similar companies and the infrastructure to support them. This also aided the problem of “orphan” technologies existing in the region. These are good ideas that cannot be built upon locally. With growth in the number of biomedical firms in the region, these issues would be reduced.

What was heard infrequently was that there were no challenges associated with being located in the Milwaukee 7 region. That was said, but by very few respondents. Biomedical firms in Milwaukee 7 do face a number of challenges. Given the variety of industries in which the 37 respondents are located, it should not surprise the reader that the challenges noted come in great variety as well.

Business Conditions

There are several elements of business conditions that can be discussed. The most common are changes in employment, sales, profitability, and investment decisions. These are discussed serially, as they were with the biomedical firms. Somewhat similar questions were asked in the Pre-Meeting Questionnaire and during the interview. The reader should be aware that the varying answers to similar questions may be attributable to the different time frames or contexts.

Employment Changes. One issue that must accompany the discussion of business conditions is what is happening in terms of changes in levels of employment. First, employers looked backward and then forward. When asked in the Pre-Meeting Questionnaire what had transpired over the preceding six months, about half the firms indicated that their employment had

increased, including 9% who said employment had significantly increased (Table 12). Only 6% reported a decline in employment. Those statements are quite positive for the industry.

Table 12: Firm Employment Change in Last 6 Months

<u>Employment Pattern</u>	<u>Frequency</u>	<u>Percent</u>
Significantly increased	3	9
Increased	14	41
About the same	15	44
Declined	2	6
Significantly declined	0	0
Total	34	100
Blank	3	

What is even more positive for the firms and region is that four-fifths of the firms indicated that they expected their employment to increase over the next 12 months (Table 13). This includes almost nine percent who expect to experience significant increases in the next year. Both views suggest that these firms are doing pretty well and are relatively optimistic about their futures. Such a view is reinforced by the fact that none of the firms interviewed expects to experience a decline in employment in the next year.

Table 13: Expected Change in Employment, Upcoming 12 Months

<u>Employment Pattern</u>	<u>Frequency</u>	<u>Percent</u>
Significantly increasing	3	9
Increasing	22	71
Staying about the same	7	21
Declining	0	0
Significantly declining	0	0
Total	34	100
Blank	3	

When CEOs were asked face-to-face about what employment change was expected in the next 12 months, some 57% indicated that they expected to experience “significant” growth in employment. No one defined “significant,” but the term implies more than a simple increase. The various responses imply that employment growth among many of these firms should be noticeable.

Sales Dimensions. The dollar volume of sales was discussed earlier. No direct questions were asked about expectations on future sales growth. (A few employers indicated that they would not discuss it anyway.) Employment growth patterns may imply sales growth. But there are

several firms that added wrinkles to the discussion of sales. For example, at least four firms indicated that they do not have any sales as of yet. One expects this to begin next month. A couple of others indicated that they have modest sales, are not yet profitable, and are not yet sure in which direction sales are headed — it depends in part on the success of continuing research and development.

On the other hand, more than 43% of the firms reported international sales, but in total 15% of sales were generated outside the US. One firm claimed that half their sales were international and that they sold to 60 different countries. Others had impressive numbers as well. That is a well developed market for some of these firms. A few other firms indicated they would like to enter this market but are feeling their way in how to enter it. One word of advice offered is to sell differently internationally and locally: be aggressive with businesses elsewhere and approach Wisconsin firms with reserve.

Sales to government entities are quite a different story in terms of participation. Over half of the firms report selling to government entities of one sort or another (government labs, schools, and colleges were mentioned (Table 14)). One firm reported that half of their sales were to government. A couple of other firms talked of possible future sales to various governmental entities.

Table 14: Sell to Government Entities

<u>Response</u>	<u>Frequency</u>	<u>Percent</u>
Yes	18	55
No	15	45
Total	33	100

Another sales theme that was heard a few times is that the Milwaukee 7 biomedical firms' strategic approach is to identify and enter markets that are small, niche markets that large competitors will ignore. The idea is to keep a low profile and hope that competitors do not see that money can be made in these areas. For the firms that discussed this strategy, it seems to be working. That strategy, however, may limit the growth potential of these firms.

Profitability Patterns. Rather than talking about sales, profitability is a topic that can apparently be discussed more openly. Firms were asked a series of questions on the subject. CEOs were quite willing to respond both to trend questions and to questions of the impact of the region on their ability to be profitable.

Before examining the region's impacts, past and future trends in profitability are examined. Firms were asked to compare current profitability with their condition three years ago (Table 15). The good news for the region is that almost two-thirds of the respondents thought that they are more profitable today than they were three years ago. Some 36% are about as profitable as they were (not indicating what that condition is). Only one was less profitable.

Table 15: Current Profitability Compared to 3 Years Ago

<u>Profitability Trend</u>	<u>Frequency</u>	<u>Percent</u>
Significantly more profitable	11	36
More profitable	8	26
About the same	11	36
Less profitable	1	3
Significantly less profitable	<u>0</u>	<u>0</u>
Total	31	101*
Blank	6	

** Rounding error*

Firms were also asked to look to the future and project their profitability three years from now. The outlook is even better than past performance (Table 16). Over 80% think they will be more profitable three years from now than they are today. And more than 40% of the respondents think they will be significantly more profitable. Their future looks very bright. Both types of claims should be good news to the region and help to convince others considering entering the field and those with angel or equity capital that these are viable industries in the Milwaukee 7 region.

Table 16: Expected Profitability in Three Years v. Today

<u>Expectation</u>	<u>Frequency</u>	<u>Percent</u>
Significantly more profitable	13	42
More profitable	12	39
About the same	6	19
Less profitable	0	0
Significantly less profitable	<u>0</u>	<u>0</u>
Total	31	100
Blank	6	

The Region's Impact on Profitability. Firms were further asked to assess just what impact the region had on their profitability. The purpose was to learn what characteristics of the region help or hurt profitability. The question was asked in the hopes that this knowledge could be used to identify factors that the region might address to help make these firms more successful.

Respondents were first asked how being located in this region positively affects their profitability. The results are summarized in Table 17. Some 39 responses were generated. For better or worse, one-third of the responses indicated that there is basically nothing in the region that positively affects their profitability. Most commented that what they did could be done any

where in the world. A couple conceded that they received modest help with lower costs on rent or employee compensation. But overall the region is not a factor to this set of firms.

Table 17: Region’s Positive Impact on Firm Profitability

<u>Positive Impacts</u>	<u>Percent</u>
None	34
Low cost of doing business	24
Workforce characteristics	18
Assorted reasons	24
Total	100

n = 36

Two-thirds of the responses, however, were that the region does positively affect their profitability. About one-quarter of all responses noted the lower costs of doing business in the region. The vast majority of these responses cited less expensive employee compensation. That statement was often accompanied by praises for the employees’ work ethic and productivity on top of their competitive wages. In fact, 18% of the responses were explicitly on the contributions of a hard working, productive, stable workforce. Inexpensive space was also cited by several as an advantage.

Less common were statements that their customers are largely or exclusively in the region. A couple noted the earlier theme of being located near specific educational institutions. And a few talked of the ease of shipping to the rest of the country from Milwaukee. Good water quality was mentioned by one firm, as were minimal local competition and access to quality professional services.

In short, several qualities of the region were cited as important to firm profitability.

But given the opportunity to look at the other side of the coin, shortfalls of the region that may limit firm profitability, respondents were quite capable of identifying conditions that they thought limited their profitability as well. Some 38 responses from 34 firms are summarized in Table 18.

Table 18: Regional Elements that Limit Biomedical Firm Profitability

<u>Negative Impacts</u>	<u>Percent</u>
None	24
Health care costs	16
Workforce challenges	13
High taxes	13
Costs other than health care	8
Difficult access to capital	8
Local market access	8
Other reasons	11
Total	101*

n = 34

* *Rounding error*

The encouraging news is that the most common response (24%) is that the region does not have a negative impact on firm profitability. Most of these responses were very direct to this point. One respondent stated that the region was good both for his business and from a personal standpoint.

Among the more common responses were themes that have been identified above. These include workforce shortcomings, high taxes, cost of healthcare, difficulty gaining access to capital, and other costs of doing business in the region. Most often heard was the repeat of the complaints that they cannot find the people they need in the local labor market (it was noted that once recruited, employees tend to stay), that taxes are too high, and that health care costs are very high. These three topics were more often noted in responses to this question than they were on any other question. The scale of the response would suggest that these are problems for a few of the firms, but they do not make it to the top of the list of most biomedical firms in the region.

Other complaints were noted by small numbers of firms. Thus, two complained about difficulty developing markets locally, and a third complained that being from the area his firm is overlooked locally as potential clients call in Chicago-area firms instead. Two others complained about the lack of a true technology cluster where firms can share talent and ideas.

There are changes that would help the region. Among the most addressable would be enlarging the trained workforce. Attempts are being made to address tax and health care costs, but those will likely take even more time. Developing credibility as local providers is another challenging assignment. A larger number of biomedical firms in the area would certainly help to address both workforce attraction and marketing challenges.

Summary Assessments of the Future. Firms were also asked about growth expectations over the next 12 months (Table 19). Employment has already been discussed. Almost three-tenths of the firms expect to make significant capital expenditures in the next 12 months. That suggests they have a positive outlook. And more than one-third expect to grow in terms of the space they

need. That is a very significant figure. They are growing sufficiently in employment and capital expenditure such that they also will need more room in which to operate. All are positive signs for the industry and region.

Table 19: Expecting Significant Growth in Regional Operations Next 12 Months

<u>Growth Category</u>	<u>"Yes"</u>	<u>Percent</u>
Employment	22	60
Capital (equipment) expenditure	10	27
Physical space	13	35

n = 35

Capital Seeking. To aid in the understanding of the frustrations of finding capital, the second most-common complaint from biomedical firms, all respondents were asked to rate on a scale of 1 (highly unlikely) to 5 (highly likely) the chances of their business seeking capital for the purpose of funding future business development and growth from each of eight possible sources. Between 22 and 25 firms responded to each question.

Table 20 lists the various potential sources of capital, followed by an average ranking of the likelihood each would be used and the percentage of firms that see each as highly likely. At the top of the list by a healthy measure are retained business earnings (3.78 on a 5.0 scale). This is commonly the prime source of funds for development and growth in most businesses. Biomedical firm managers are in-line with this thinking. Second-most common source is grants (2.84). These grants may well be Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) from the federal government. Those are the most common, but others are likely available as well.

Table 20: Likelihood of Seeking Capital from Alternative Sources

<u>Source of Funds</u>	<u>Ave. rating</u>	<u>% with "5" rating</u>	<u>n</u>
Retained business earnings	3.78	63	27
Grants	2.84	32	25
Conventional debt	2.38	19	26
Personal savings and debt	2.36	24	25
Venture capitalists	2.24	16	25
Angel investors	2.13	16	24
Family and friends	1.5	4	24
Equity markets	1.5	4	26

5 = Highly likely; 1 = Highly unlikely

Conventional debt at 2.38 is third most likely source of capital. This appears a bit low when compared to other industries, where many firms depend heavily on banks for financing of business development. The lower figure for biomedical reflects the previously described problem of biomedical companies not being treated like traditional manufacturing firms and having difficulty gaining access to capital via this route.

What is also clear is that few (4%) of these firms expect to get capital from equity markets. In other words, they are usually not seeking to become public companies. For many it is premature; for others, it may be an informed decision, given the additional costs associated with public companies today.

There appears to be some interest in seeking venture capital. The relatively low average (2.24) would suggest that few of the firms see this as a promising route to capital at this point, but a few do. Such funds are difficult to find in Wisconsin (last year Wisconsin received about 1% of all VC money invested in the US), but the odds may increase in the near future.

Dimensions of Workforce Challenges

Before identifying the deficits in the regional workforce, firms were asked to identify positive attributes of the regional workforce. The question was asked to solicit both sides of the issue and to see if there are other characteristics of the workforce that had not been mentioned in earlier questions. It was wise to ask about attributes because 95% of the respondents could identify at least one positive attribute of the local workforce, and over 80% could identify at least two positive attributes. That puts the region in a very good position at the outset.

Table 21 shows the distribution of answers. The responses are separated into eight categories. By far the most common characteristic identified was the strong work ethic, a term that covers such characteristics as hard working, productive, loyal, honest, flexible, and punctual. In the previous round of CEO calls, manufacturing employers in the region also identified work ethic as the most common, positive attribute of the workforce. With two-fifths of the biomedical employers noting this characteristic, it is clearly important to employers and to the region's economy.

Table 21: Positive Attributes of the Region's Workforce

<u>Positive attributes</u>	<u>Percent</u>
Strong work ethic	40
Literate/well educated	15
Well trained/skilled	14
Other reasons	10
Available	8
Great attitude	6
Diverse	5
None	2
Total	100

n = 36

Common to one-quarter of the firms was their assessment of workforce as being either well trained and highly skilled or literate and well educated, the latter applying more to the many scientists and IT workers the firms employ. Graduates of area colleges and universities were specifically cited for particular positions. But more often broad statements about the quality of the workers are what appeared. Interestingly, less than one-tenth of the firms noted that there were workers available, echoing one of the challenges noted. One respondent, however, stated that the talent pool of biologists is extraordinarily large with grads of UW and others waiting around to go to medical school. He went on to say this allows his firm to pay half as much for such people as they would have to pay on the coasts.

A few firms noted the diversity of the workforce, worker commitment to stay in the region, and a characteristic they did not find in many other labor markets, a willingness to learn more. Also noted, but not nearly enough, was the workforce’s concern with quality, a critical issue in these industries.

Shortcomings of the Region’s Workforce. Despite the many compliments paid to the regional workforce, 32 of 34 respondents were also able to note at least one shortcoming. What makes this more challenging for the region is that the shortcomings are far more varied than are the positive attributes. But by far the most common shortcoming are shortages of workers with specific skill sets. Some respondents were more specific than others, but several different combinations of skills were thought by at least one person to be in short supply in the region.

Table 22 shows much of the range of shortcomings that were identified. The largest problem with the region’s workforce is the shortage of specific types of workers. A number of different problems were cited, and the responses never overlapped. Each firm had a different type of worker that they found in short supply. That is quite remarkable. A few comments did overlap when they mentioned shortages of “technical workers. But once the specific technical skill was mentioned, it was not duplicated.

Table 22: Shortcomings of Milwaukee 7 Region’s Workforce

<u>Shortcomings noted</u>	<u>Percent</u>
Shortages of workers	51
Specific problems with workers	24
Intermediary problems	15
Other issues	10
Total	100

n = 34 firms; n = 57 issues

Here are a number of the positions thought to be in short supply locally:

- Biologists*
- Biomedical engineers*

CAD workers
Glassblowers
Higher level technical chemists
High-end technical people with management skills
IT people with medical imaging experience
Managers with Life Science experience
Protein chemists
Others talked of a shortage of semi-skilled workers, entry-level workers with skills, and concurrently, those with advanced degrees.

Respondents also mentioned several other problems with the regional workforce. One set complained about the intermediaries and what quality they produced. MPS was cited twice, and area colleges and universities were criticized for the paltry number of cooperative/intern experiences available.

Also named were a number of unrelated issues that employers identified. These included workers without skills, poor work ethic in entry-level workers, lack of ethics among workers, too much cell phone use, workers inconsiderate of company time, and workers with unrealistic compensation expectations. A few employers thought the workforce was “provincial,” homogeneous, and overly risk adverse (not wanting to come to work for start-ups). Several complained about management deficiencies, for example, not enough strategic thinkers, not enough mid-level managers, and management that was too mobile. Somewhat surprisingly, these comments were never made more than twice, and most often were made just once.

The overwhelming challenge is the shortages of workers with specific skills. If those problems can be addressed, it is likely that several of the other problems cited would also be reduced.

Current Workforce Challenges. Employers were asked what difficulties they were facing at this point in their development with regard to each of several different job classifications. The question sought to learn just how challenged they currently are in meeting their workforce needs. Table 23 gives the results.

Table 23: Difficulty Recruiting and Retaining Workers by Occupation

<u>Occupation</u>	<u>Recruit</u> <u>ave. rating</u>	<u>Retain</u> <u>ave. rating</u>	<u>n, n</u>
Professional	4.46	4.62	13, 13
Clerical and administrative support	4.17	4.65	18, 17
Skilled workers	3.80	4.21	15, 14
Managerial and supervisory	3.71	4.13	17, 16
Marketing/sales	3.71	3.92	14, 13
Unskilled workers	3.71	4.27	12, 11
Technical	3.37	3.91	27, 23

5 = Not at all difficult; 1 = Very difficult

In terms of hiring, it appears that biomedical firms are not having much difficulty filling the jobs they have, in spite of what was reported above. With the average score of 3.85, it would appear that finding workers they need is somewhat easy. The one exception, and not a very large one at that, is “technical” workers, which earned a 3.35, a bit above the mid-range of easiness. The firms talked of problems with workforce, but when it comes down to rating problems on a scale, the criticisms appear considerably milder than the discussion would suggest, at least up to this point in time.

Retaining workers is even easier: the average score is 4.24. The lowest score is 3.86, and five scores are well over 4. Very good wages may play a role. But the assessments are even higher than those for hiring. Once these individuals get in place, the firms prove to have strong glue. Retention is not an issue.

Training the Workforce. Perhaps the training given to workers is part of the reason that retention of workers is seldom a problem among these biomedical firms. To help determine this, we examine several questions asked employers regarding training. The basic approach was to ask respondents about the utilization of several different forms of training. The results appear in Table 24.

Table 24: Types and Utilization of Training Among Biomedical Firms

<u>Type of Training</u>	<u>% of firms</u>	<i>Percent of Workforce Participating</i>		
		<u>1-25%</u>	<u>26-75%</u>	<u>76-100%</u>
Structured classroom training	38	42	8	50
On-the-job training	63	5	26	68
Tuition reimbursement	45	86	15	0

Structured classroom training is not used by many (38%) of firms. Those that use it include a limited number of employees or close to all employees in their training sessions. It is a bimodal distribution. Tuition reimbursement is used by a few more employers (45%). It is largely utilized by 25% or fewer of their employees. On-the-job training is much more commonly utilized (63%). Most firms utilize this form of training for the bulk of their employees. Over two-thirds of the respondents offer it to 75% or more of their employees.

These numbers are not overwhelming, but they do suggest that continual training is employed by firms in this industry and that it is likely important to both the firms and their employees.

Future Workforce Challenges. To gain an even better sense of what workforce issues need to be confronted for these firms and others like them to thrive, firms were asked to look ahead three years and reveal what they saw as the most critical workforce challenges. Thirty of the firms were able to state which workforce challenges they see as most critical to their futures.

The most common workforce challenge, faced by almost 30% of the firms, is recruiting experienced, talented workers to support their growth (Table 25). Often mentioned were

workers with science and industry backgrounds. One did mention IT work as well. Obviously, many see this as a problem today as well. They also see it in their futures.

A part of the challenge to growth for some firms is hanging onto their existing workers. One firm mentioned that it was losing its talent to raids by larger firms. Another talked of the training they must do and the frustration of losing that investment. Another mentioned the challenge of finding young talent that is interested in growing with the business. Such challenges are not unique to biomedical; they challenge many start-ups in all industries.

Table 25: Critical Workforce Challenges over the Next Three Years

<u>Challenges</u>	<u>Percent</u>
Recruiting experienced, talented people	29
Maintaining their current workforce	15
Getting sufficient money to pay new workers	12
Aging workforce	6
Finding young, flexible workers	6
Assorted issues	15
None	18
Total	101*

n = 30; responses = 34

* *Rounding error*

Several respondents commented on the challenge of generating enough money to pay for the talent they hope to recruit. Several have plans for growth, as was noted above. That requires financial resources. It is natural that this is seen as a challenge.

The next most common responses are at two ends of the age spectrum. Two employers worry about replacing their aging workforce while two others are concerned about finding young workers who are flexible enough to work on the ever-changing needs of small companies. For some individuals being this flexible is very difficult.

The last set of worries is cited because they do give insight into what conditions face these biomedical firms. One is locating employees who want to train. Apparently, this is not as common as we'd like to believe. Another firm worries about paying for health insurance for his employees. A third is concerned about finding workers who can overcome the risk aversion of working for a small firm. And a fourth is challenged by finding the talent needed to build the management team.

The general tenor of these concerns is that their worlds will not change much in three years. The challenges they see today will still be here in three years, or at least that is what they indicated. The region needs to address these workforce issues, if these and other biomedical businesses are

going to have confidence that they can indeed find the workers they need in the Milwaukee 7 region.

Business Climate and Impact on the Firms

The assessment of the region’s business climate is an important question for those seeking to expand the biomedical sector in the Milwaukee 7. As has been seen, there are many pluses and minuses to being located in this region. What the pre-meeting survey tried to do was distill some of these many reactions into several common measurable items to see what could be learned from the exercise.

One series of questions gave respondents a list of 13 common topics related to business climate. Employers were asked to give these topics two different ratings on scales of one to five. One rating was the importance of the topic to them; the second was an actual rating of the region’s standing on that item. On the importance, a five means that it is very important. On the rating of the region, a five means that the region is excellent. The results appear in Table 26.

Table 26: Rating of Business Climate and Its Importance to the Region’s Firms

<u>Element</u>	<u>Importance ave. rating</u>	<u>Quality ave. rating</u>	<u>n</u>
Availability of skilled technical workers	4.47	3.50	30
Availability of managerial talent	3.95	3.18	31
University/college education	3.90	3.65	30
Health care expenses	3.83	2.17	29
Access to capital	3.71	2.54	28
Access to university resources	3.69	3.43	29
Availability of appropriate office/lab space	3.68	3.58	26
Supportive environment for entrepreneurs	3.59	2.69	29
State taxes	3.57	2.13	30
Image as a "tech-friendly" region	3.48	2.48	29
Business and professional networks	3.41	3.14	29
Local taxes	3.33	2.50	30
Regulatory climate	3.33	3.05	30
Average	3.69	2.93	

Importance: 5 = Very important, 1 = Not important Climate Rating: 5 = Excellent, 1 = Poor

At the top of the list in terms of importance to the firms, reinforcing the commonly reported theme, is the availability of skilled technical workers (4.47). That is a very high average score, and it serves to underline just how important skilled workers are to the success of the biomedical sector. Fortunately, the assessment of the availability of such workers is decent (3.5). But it will need to be higher for the sector to grow as quickly as many want.

The second-most important theme is the availability of managerial talent (3.95). As was reported above, this is thought by many to be a key ingredient to success. Many comments were made of the difficulty of finding experienced managers in the industry. This thought is reflected in the rating of 3.18 on the availability of managerial talent. That is not too low a score – it is in the middle – but it does show that a portion of the firms are being negatively affected by this issue.

Other topics high on the list of importance are university/college education (3.9), health care expenses (3.83), and access to capital (3.71). All three topics were reported above in the open-ended questions. The access to college graduates with appropriate educations is obviously rather important to a knowledge industry. Health care costs loom large for any employer in the region. And access to capital was very often mentioned as a concern. Unfortunately for the region and its biomedical employers, only access to graduates of colleges and universities was somewhat highly ranked (3.65). Access to capital was rated 2.54, reflecting the many complaints that employers expressed. And health care costs were rated even worse (2.17), reflecting the state of those costs in the region.

In terms of importance all 13 factors were rated as being at least somewhat important, as all scores were above a mid-point score of three. The combined average was 3.69. On rating conditions in the region, however, six of the thirteen scores were below three, and the average was 2.93. The worst were state taxes (2.13) and health care (2.17), followed by image as a tech-friendly region (2.48), local taxes (2.5), and access to capital (2.54). There obviously are several elements of the region’s business climate that need attention, as far as the biomedical employers are concerned.

A critical piece of news is that the overall assessment of the business climate (2.93) is somewhat lower than that given the region by manufacturers (3.02) in our earlier study. That score suggests that if the region wants to grow biomedical, it must address the many problems identified by respondents to the survey.

Changes in the Business Climate. To get a sense of whether these firms thought that the business climate has been improving, those interviewed were asked the degree to which the region’s business climate was different from that of three years ago. About 42% thought that the region had made progress in the last three years: the climate was better or much better today (Table 27).

Table 27: Regional Business Climate Today v. Three Years Ago

<u>Status</u>	<u>Frequency</u>	<u>Percent</u>
Much better today	3	9
Better today	11	33
No change	16	49
Worse today	3	9
Much worse today	<u>0</u>	<u>0</u>
Total	33	100
Blank	4	

When asked if they thought the business climate would change over the next three years, the biomedical industry leaders were even more optimistic (Table 28). About three-fifths of them thought that the region’s business climate would improve over the next three years. That is quite a vote of confidence. Unfortunately, there are a few that see the climate going in the other direction. The challenge will be proving that the larger group is correct.

Table 28: Forecast of Regional Business Climate in Three Years

<u>Forecast</u>	<u>Frequency</u>	<u>Percent</u>
Much better than today	3	9
Better than today	16	46
No change	13	37
Worse than today	2	6
Much worse than today	<u>1</u>	<u>3</u>
Total	35	100
Blank	2	

Additional Climate Insights. A number of these business leaders went far beyond the numerical assessment of the business climate. It is a topic they give thought to and on which they wanted to express a variety of opinions. One common theme was that the entrepreneurship/venture capital climate in the Milwaukee 7 region is too conservative. The Milwaukee 7 is permeated by a risk-averse culture that dampens the entrepreneurial spirit and limits personal and corporate commitment to those with new ideas. The respondents talked of the of climate of firms in the region that do not take risks, leaders who do not devote their lives to an idea or business passion, or lenders who provide insufficient risk capital. They think that the community must develop a new culture that encourages start-ups and that generates angel money for entrepreneurs. A frequently heard comment was that the community, including various levels of government, does not support entrepreneurial ventures.

A second common theme was that of education and its critical role. There were compliments for a highly educated workforce at the same time there was strong criticism of the current rigor of K-12 education (the pipeline for the future pool of technical talent). Some, but not all of that criticism, was aimed explicitly at MPS. There was also some criticism of the underwhelming linkages between universities and businesses and the need to have these elements partner regularly.

A third theme was the futility of Madison/Milwaukee competition. These two communities should be working together. The sentiment expressed was that Madison was a much larger beneficiary of state government dollars and that this pattern should be changed to better balance Milwaukee. Interestingly, one comment was that Milwaukee may struggle to catch up with Madison in biotech but that Milwaukee already has a much stronger IT base.

The usual business climate criticisms were also prevalent, especially health care costs and taxes. But there were also a few individuals who were very positive about the region’s business climate. Many commented on the improvements made over that last several years.

In short, business climate is important to the biomedical community. More extended comments were made on this topic than any other in the interview. Not all agree on the current conditions, but many share similar assessments. It is a topic that warrants further consideration and certainly some attention if the industry’s needs are to be met.

Desire for Use of Service Programs. Respondents were asked a series of questions on their likelihood of using any of several different service programs. The six services are listed below in Table 29. Most of the firms responded.

On each subject the firms were asked to rate their level of interest on a scale of one (no interest) to five (a great deal of interest) in utilizing the service listed. The general assessment is that there is interest in only two of the topics. Those two are in gaining better access to capital and in becoming involved with business networking organizations. Each scored an average in the 3.26-3.27 range. This does not represent a crying need, just one that suggests it is of interest to several of these firms.

What is clear is that there is little interest in business planning assistance programs (1.89), shared labs, computer platforms, or manufacturing facilities (2.04), incubator space (2.21), or advisory boards for biomedical companies (2.4). These firms are doing pretty well with the resources they have. Yes, they can learn more about accessing the capital that many strongly desire, and yes, several are interested in business networking. Both are topics that can and should be pursued. But the others are not priorities, except for a few firms.

Table 29: Relative Desire to Access Service Programs

<u>Program Type</u>	<u>Ave. rating</u>	<u>n</u>
Access to capital programs	3.27	30
Business networking organizations	3.26	31
Advisory boards for biomedical companies	2.40	30
Incubator space for new tech start-ups	2.21	29
Shared labs, computer platforms, or mfg. facilities	2.04	28
Business planning assistance programs	1.89	28

Firms were also asked a series of five other questions on assistance that they might want to receive. Each respondent was asked a simple yes/no with regard to being the recipient of help on each of the topics. As it turns out, there is some demand for help (Table 30). In the neighborhood of one-third of the firms want help on four topics; closer to one-fifth want help on the fifth topic (IP).

Table 30: Interest in Specific Forms of Assistance

<u>Issues for Assistance</u>	Percent <u>“Yes”</u>
Physical expansion	37
Forming relationships with other firms	30
Receive information on training and programs	29
How to sell to government entities	29
Local resources for IP	19

To help the biomedical sector flourish, some efforts should be made to provide the services and insights requested. There is ample demand for help.

Conclusion

One clear point from these surveys is that there are several reasons why biomedical firms are located in the Milwaukee 7 region. The reasons – the presence of GE Healthcare, the presence and accessibility of area colleges and universities, lower costs of doing business than on the coasts, availability of skilled workers, increasing statewide interest in promoting biotechnology, and desirable quality of life – suggest that there are likely to be more such firms in the future. Today’s modest employment levels might scare some readers. But several of the biomedical firm leaders think that there is potential in the region for some real successes.

Biomedical seems to be a reasonable field to try to expand in Milwaukee. The industry has a good start (12th ranked city in medical device and equipment employment), some promising and already successful companies, and the beginnings of a core of workers and management that understand the science and how to get to market. That said it is wise to mention one comment made by a firm founder: This is a risky business. “If R&D fails, if the product is not approved by the FDA, if the company is not funded further, the firm’s future is at risk.”

That is the nature of this business for several firms involved in the development of new products and processes. Individuals may give up a great deal to find solutions to human health problems. It is exciting. But it is also chancy. Furthermore, the risk is contrary to several decades of reliance on manufacturing in the region. But it is precisely this type of informed risk that likely needs to be taken, if the Milwaukee 7 region is to help develop replacements for the tens of thousands of manufacturing jobs lost in the region. Biomedical is not the sole answer to the region’s economic challenges, but it surely has the potential to be a part of the solution.

From the biomedical firm perspective there are a number of steps that the region should take. Several of these steps are listed below. It is up to the region and its leadership to decide how much effort should be made to meet the needs of this emerging industry that wants to see a critical mass of biomedical firms grown here. Among the points made by the leaders of Milwaukee 7 biomedical firms are the following:

- Invest in workforce development and in K-12 programs that interest and prepare more students for the biomedical world of work.

- Build capacity at area colleges and universities for greater preparation of scientific and technical workers.
- Build much larger cooperative and internship programs at area colleges and universities to build interest and experience in fields that contribute to biomedical.
- Build capacity at area colleges and universities for IP development and transfer.
- Expand the financial capital available at the many stages of firm development, starting with business angels and proceeding through conventional debt to venture capital.
- Become more entrepreneurial as a region, so that risk is better understood and supported.
- Address the oft-criticized elements of the regional business climate, such as health care costs, access to capital, access to university resources, and improving the image of the region as tech friendly. All are thought to be important.
- Accept the smaller scale of the biomedical industry and its actors and continue to put into place those elements that will help build the biomedical industry. The industry may have payoffs for the region down the line.

These steps would benefit not only biomedical but many other industries as well. The biomedical respondents have put these recommendations on the table and made the case for their wisdom.

PRE-MEETING QUESTIONNAIRE

Version 1.3 (BIOMEDICAL)



Company name: _____
Survey completed by: _____

Date: _____

Instructions: Thank you for agreeing to meet with a representative of the Milwaukee7 to help us learn more about the challenges you face running a company in southeastern Wisconsin. The information you provide will remain confidential.

Please complete this questionnaire prior to the in-person interview and return it to our representative at the time of the interview.

Note: The term "region" is defined as the seven counties that comprise the Milwaukee7: Kenosha, Milwaukee, Ozaukee, Racine, Waukesha, Washington and Walworth.

1. Does this site serve as the company's headquarters?

Yes No

If "no," what is the name of the parent company and where is it located?

City: _____ State: _____

2. What year was your company founded? _____

3. Is your company a spinoff from a college or university?

Yes No

If "yes," which institution? _____

4. Where are your company's operations located (choose one)?

- All company operations are housed at this site
- The company has additional operations located inside the 7-county region
- The company has additional operations located outside the region
- The company has additional operations located inside **AND** outside the region

5. What is total employment (full-time equivalent) for your company?

This site: _____
Region (7-county): _____
Wisconsin: _____
U.S.: _____
Worldwide: _____

6. Please indicate the portion of your workforce at this site in each of the following job classifications **AND** the average hourly wage (minus benefits) for employees in each classification:

	<u>% of workforce</u>	<u>Avg. hourly wage</u>
Technical (scientists, engineers, IT, etc.)	%	\$
Professional (lawyers, accountants, analysts, specialists, etc.)	%	\$
Managerial and supervisory	%	\$
Marketing/sales	%	\$
Clerical and administrative support	%	\$
Skilled workers (trades)	%	\$
Unskilled workers	%	\$
	100 %	

7. Please characterize the change in employment at this site in the last 12 months:

- Significantly increased
- Increased
- About the same
- Declined
- Significantly declined

8. Please characterize the expected change in employment at this site for the upcoming 12 months:

- Significantly increasing
- Increasing
- Staying about the same
- Declining
- Significantly declining

9. What percent of this site's workforce do you expect to lose to retirement in the next 3 years (check one)?

- 1 – 9%
- 10 – 25%
- 26 – 50%
- 51 – 75%
- 76 – 100%

10. Please indicate the difficulty your company has experienced in the previous 12 months hiring **AND** retaining qualified employees at this site in the following job classifications:

**HIRING
DIFFICULTY**

5 = Not at all difficult,
1 = Very difficult

**RETAINING
DIFFICULTY**

5 = Not at all difficult,
1 = Very difficult

Technical (scientists, engineers, IT, etc.)		
Professional (lawyers, accountants, analysts, specialists, etc.)		
Managerial and supervisory		
Marketing/sales		
Clerical and administrative support		
Skilled workers (trades)		
Unskilled workers		

11. Please list annual sales for your company. What has been the sales trend over the past three years?

	<u>Annual Sales</u>	<u>Growing/Declining/Stable</u>
Companywide	\$ _____	_____
This site	\$ _____	_____

12. What percent of sales from operations at this site is generated by your top three customers?

- 1 – 9%
 10 – 25%
 26 – 50%
 51 – 75%
 76 – 100%

13. What percent of your sales is generated from customers located:

Outside the region (including international) _____ %
 Outside the U.S. (internationally only) _____ %

14. If this site has international sales, please list the three countries that generate the highest amount of sales (list highest to lowest):

- a. _____
 b. _____
 c. _____

15. Please indicate the likelihood of your business seeking capital from **EACH** of the following sources for the purpose of funding future business development and growth:

LIKELIHOOD
 5 = Highly likely,
 1 = Highly unlikely

Retained business earnings	
Personal savings and debt	
Family and friends	
Angel investors	
Venture capitalists	
Conventional debt	
Equity markets	
Grants (SBIR, etc.)	

16. With regard to your company’s supplier base for this site, please indicate the portion of total supplier expenditure directed to firms in the following locales:

Region (7-county)	_____ %
Wisconsin (excluding region)	_____ %
U.S. (excluding all of Wisconsin)	_____ %
International (excluding U.S.)	_____ %
Total	100 %

17. Please rate the following aspects of the regional business climate **AND** rate the importance of each factor:

RATING **IMPORTANCE**
 (5 = Excellent, 5 = Very important,
 1 = Poor) 1 = Not important)

Availability of skilled technical workers		
Availability of managerial talent		
Local taxes		
State taxes		
Regulatory climate		
Access to capital		
Health care expenses		
Supportive environment for entrepreneurs		
Image as a “tech-friendly” region		
University/college education		
Access to university resources (research, testing, evaluation and training)		
Availability of appropriate office/lab space		
Business and professional networks that support technology companies		

18. What is the status of physical facility located at this site?

Owned Leased

19. If facility is leased, what is the lease expiration date: ____/____/____ (mm/dd/yyyy)

20. How much of this facility's space are you currently using? _____%

21. Is there room for physical expansion of your business at this site?

Yes No

22. Will you require new and/or additional wet lab space in the next 12 months?

Yes No

If "yes," how much? _____ sq. ft.

23. Are you aware of the following organizations (check if "yes")?

Wisconsin Biomedical & Medical Device Association
 Biomedical Technology Alliance

24. Please indicate how likely your company would be to use the following services if provided through a public and/or private business partnership:

LIKELIHOOD
5 = Highly likely
1 = Highly unlikely

Access to capital programs	
Incubator space for new technology start-up operations	
Business planning assistance programs	
Shared labs, computing platforms or mfg. facilities for biomedical companies	
Advisory boards for biomedical companies	
Business networking organizations	

MANDATORY QUESTIONS

Version 2.3 (BIOMEDICAL)



Company name: _____
Interviewer: _____

Date: _____

Instructions for interviewers: Please ask the following questions during the in-person interview with the top executive.

COMPANY INFORMATION

1. What makes your company successful here (i.e., what are your competitive advantages)?

2. What are the top three challenges facing your company at this location?

a. _____

b. _____

c. _____

3. Are you expecting significant growth in regional operations in any of the following areas during the next 12 months (check all that apply)?

- Employment
- Capital (equipment) expenditure
- Physical space

4. Do you expect to relocate your operations in the next 1 to 3 years?

- Yes No

If "yes," do you expect to stay in the Milwaukee 7 region?

- Yes No

5. If "yes" for any of the above (Question #3 and/or #4), would you like assistance from local officials in planning/executing the expansion (e.g., financing, real estate, hiring)?

- Yes No

6. What factors, if any, are currently inhibiting your company's growth? _____

7. Has your company established formal relationships with other firms in the region for the purposes of developing and sharing intellectual property, introducing new products/services, streamlining processes (e.g., customer/supplier partnerships), or marketing your products/services?

Yes No

If "yes," please describe: _____

If "no," would you be interested in learning more about forming such relationships?

Yes No

8. Company information notes: _____

LOCAL WORKFORCE

9. Please describe the three most positive attributes of the local workforce:

- a. _____

- b. _____

- c. _____

10. Please describe the three most critical shortcomings of the local workforce:

- a. _____

- b. _____

- c. _____

11. What are the most critical workforce challenges your company will face in the next three years? _____

12. Has your company provided structured classroom training to employees either in-house or through an outside vendor in the past 12 months?

Yes No

If "yes," what portion of your workforce has participated in these efforts?

- 1 – 9%
- 10 – 25%
- 26 – 50%
- 51 – 75%
- 76 – 100%

13. Has your company provided on-the-job training to employees either in-house or through an outside source in the past 12 months?

Yes No

If "yes," what portion of your workforce has participated in these efforts?

- 1 – 9%
- 10 – 25%
- 26 – 50%
- 51 – 75%
- 76 – 100%

14. Has your company provided tuition assistance or tuition reimbursement to employees that pursued education and training in the past 12 months?

Yes No

If "yes," what portion of your workforce has participated in these efforts?

- 1 – 9%
- 10 – 25%
- 26 – 50%
- 51 – 75%
- 76 – 100%

15. Please describe any major workforce training initiatives not listed above: _____

16. Would you like to receive information on workforce training options and government-sponsored programs that can offset the cost of training?

Yes No

17. Workforce notes: _____

SALES

18. Compared to three years ago, please describe the current profitability of your company:

- Significantly more profitable
- More profitable
- About the same
- Less profitable
- Significantly less profitable

19. Compared to today, please project the future profitability of your company:

- Significantly more profitable
- More profitable
- About the same
- Less profitable
- Significantly less profitable

20. How does being located in this region positively impact your profitability? _____

21. How does being located in this region negatively impact your profitability? _____

22. Does your company sell to governmental entities?

- Yes No

23. Would you like to learn more about selling to governmental entities?

- Yes No

24. Would you like to learn more about international exporting opportunities?

- Yes No

25. Sales notes: _____

TECHNOLOGY AND INNOVATION

26. What are your company's immediate technology needs? _____

27. Would you like to be connected with local resources for meeting those needs?

Yes No

28. How important is it to your company's future to continually develop intellectual property (5 = Very important, 1 = Not at all important)? _____

29. Describe the character of your company's intellectual property (e.g., processes, functions, devices, etc.): _____

30. Would you like to learn more about local resources for developing, deploying, accessing or protecting intellectual property?

Yes No

31. Technology notes: _____

BUSINESS CLIMATE

32. Please rate the overall regional business climate (5 = Excellent, 1 = Poor): _____

33. Please compare the regional business climate today versus three years ago:

- Much better today
- Better today
- No change
- Worse today
- Much worse today

34. Please forecast the condition of the regional business climate three years from today:

- Much better than today
- Better than today
- No change
- Worse than today
- Much worse than today

35. Are you aware of companies based outside the U.S. interested in establishing branch locations here?

Yes No

36. If "yes," may we contact? _____

37. Business climate notes: _____

ASSESSMENT (to be completed by the interviewer)

38. Please rate local management's affinity to the community (1 = Excellent, 5 = Poor): _____

39. Please rate the risk of this site closing in the next 3 years (1 = Very high, 5 = Very low): _____

40. Please rate the risk of this site downsizing in the next 3 years (1 = Very high, 5 = Very low):

41. Please rate the physical condition of the facility (1 = Excellent, 5 = Poor): _____

42. With regard to physical space, please rate the usability and efficiency of the facility (1 = Excellent, 5 = Poor): _____

43. Assessment climate notes: _____

