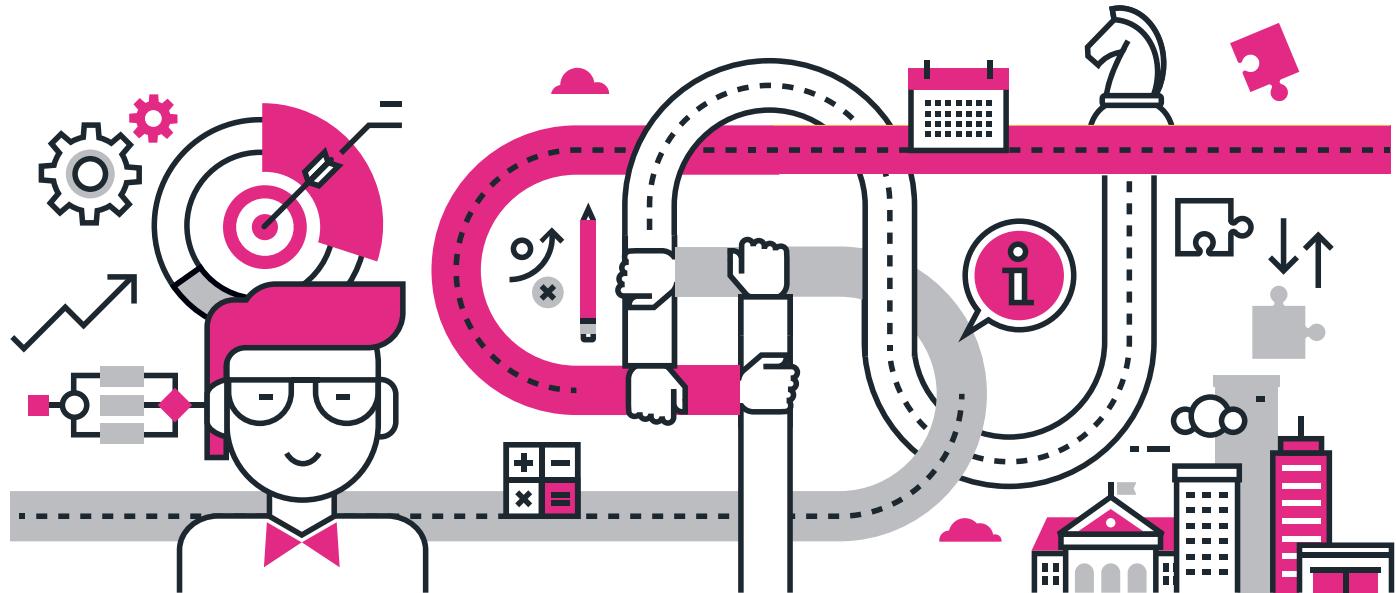


MEMS (AND SENSORS) MARKETING: OXYMORON OR OPPORTUNITY

ROGER H. GRACE, PRESIDENT, ROGER GRACE ASSOCIATES



Introduction

The American Marketing Association defines marketing as “the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.”

In my over 30 years as an independent technology marketing consultant, I have worked with literally scores of clients, the majority of which have been in the MEMS/sensors sector that have engaged my consulting services to assist them to increase their success in the market, either to successfully accelerate their existing products into the market, launch new products or even launch new companies. And to all of them I say ‘thank you’ for being so trusting, generous and enlightened to understand the value

The American Marketing Association defines marketing as “the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.”

of marketing as a means to help them to attain success in the marketplace. However, there are many other organisations who fall into the category of

‘unconscious incompetents’, a phase that my long-time dear friend and colleague Professor Steve Walsh, who also serves on this publication’s editorial advisory board, uses to describe organisations that do not accept the fact that they do not know that they need marketing to help support their business goals. This brief article is an attempt by the author to bring to light some of the basic tools that are available to MEMS (and sensor) suppliers to help the ‘unconscious incompetents’ and more enlightened others to assist them to better market and thus maximise their chances to attain success in the market.

The role of marketing in a successful commercialisation process

An article on the MEMS commercialisation process was first published in CMM in 2012 [1], and its process flow is shown in figure 1. In the ‘front end’ of this process, market research is a key factor to help better understand:

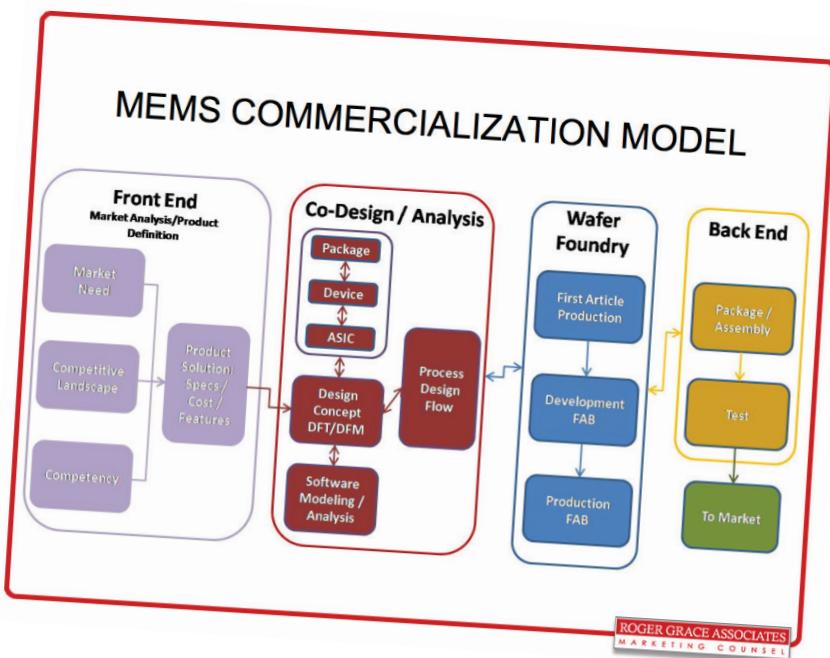
- Unfulfilled market needs
- Define the competitive landscape
- Define the core competencies of the organisation

Without a thorough understanding of these issues, a firm is more likely to be a failure than a success. This is especially true when launching a new company and/or a new product [2]. Please keep in mind that we are assuming that the product is viable, the market exists, the funding adequate and the team qualified. In the ‘back end’ of the process, it is critical to be able to plan and execute a programme of promotion of the product and the development of the proper sales/distribution channels to deliver the product into the hands of the customer. The market research activities conducted in the front end of the process can be quite valuable in developing and sustaining the following marketing principles, which come to play in the ‘back end’ of the process. These include:

‘positioning’ i.e. the place that a product/service/organisation occupies in a consumer’s mind that relates to competing products/services/organisations in the marketplace

‘branding’ i.e. the marketing practice of creating a name, symbol or design that identifies and differentiates a product/service/organisation from other products/services/organisations.

‘promoting’ the product/service to the target audience(s) as well as better understanding the pros and cons of the various sales/distribution channels available.



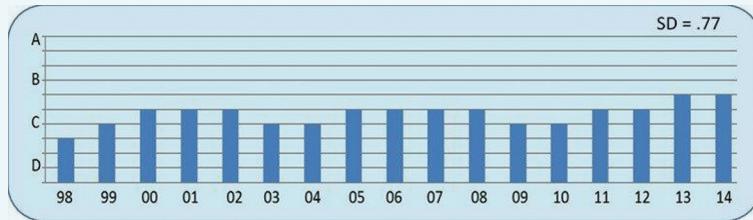
<< Figure 1: The MEMS (as well as sensors) commercialisation process begins and ends with marketing functions, market research on the front end and promotion on the back end. Courtesy: Roger Grace Associates. >>

Experience. Knowledge. Tenacity. Passion.

Ask us what we'll bring to your next project.



MICROFLUIDICS | CUSTOM LABWARE | TITRE PLATES | MICRO MOLDING



In 1998, I created the MEMS Commercialisation Report Card which appeared in this publication for the first time in 2011 [3] and annually since that time. In the 14 critical success factors for commercialisation success, marketing and market research have been two of the factors that have been monitored yearly. Suffice it to say that after reviewing the grades of these two topics given in figure 2 for marketing and figure 3 for market research, the MEMS industry has not been a good student.

Discussion

To better understand and present the problem, I have elected to use the responses from a recent Report Card market study to best demonstrate the issues. As part of my MEMS Commercialisation Report Card, I not only ask respondents to 'grade' the 14 topics but to also provide verbatims for the rational of their grade.

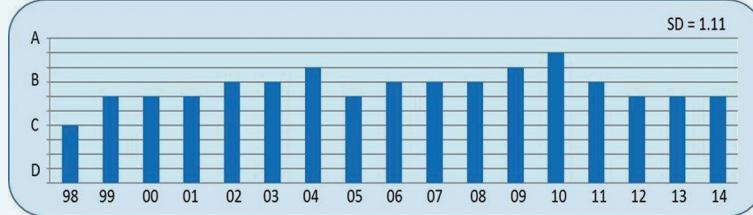
The following are a selection of recent Report Card verbatim responses to better provide you with an industry voice, not just the author's perspectives and opinions on these topics:

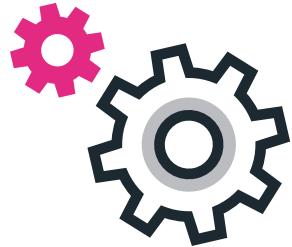
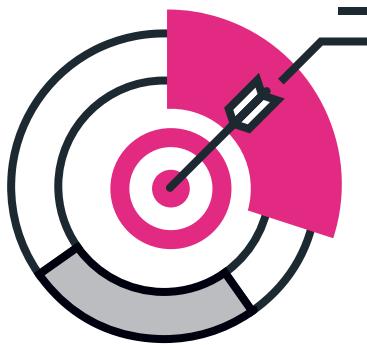
<< Figure 2: MEMS marketing continues to receive less than favorable grades; the good news is that it has improved slowly from a C to a B- over the past four years. The standard deviation is noted for all grades from 1998 to 2014 and shows a minor variance over the reporting period.

Courtesy: Roger Grace Associates. >>

- Thanks to smart phones, users are aware of MEMS
- MEMS is not marketed, but rather individual products now, as the markets have matured beyond a technology sell.
- MIG has done a noteworthy job and deserves a higher grade. Companies like Invensense are aggressively marketing.
- Many companies lack visionary marketing, and as a result follow en masse the latest trends. As a result, there are a lot of similar products.
- Marketing will always be difficult since the application of the technology spans so many traditional markets.
- Still too much 'herd mentality', especially in the consumer segment
- MEMS seems to self-market, little to no involvement in 2012
- Marketing resources are available in the industry. Not sure that companies developing unique solutions know how to approach unique marketing requirements.
- Marketing? I don't see any MEMS marketing (author's note: this truly summarizes my opinions on the subject)

<< Figure 3: MEMS marketing research heretofore has primarily focused on the mobile phone sector and published reports has been specific to addressing market size and growth. Lackluster grades have been dominated this subject historically. >>





Marketing

Based on my long-time and extensive experience in the international MEMS/sensors community and my stint as an adjunct faculty member at the University of California Berkeley School of Engineering teaching a course on business plan development, I believe that marketing efforts by organisations to support the sales of sensors/MEMS devices and services has been hampered by a 'technology push' versus that of an 'applications/market' pull strategy. I also believe that this is due to the management of MEMS/sensors companies coming from a research and engineering background where management's opinion includes: 'technology is king', 'technology trumps marketing' and 'anybody can do marketing.' My opinions are highly correlated with the results of the Report Card verbatims. MEMS/sensors marketing has typically received mediocre grades with the lowest being C- and hovering in the C level. I believe that 'MEMS / sensors marketing is considered to be an oxymoron primarily influenced by management's :

Lack of knowledge and familiarity of basic marketing principles

Lack of adequate market research on unfulfilled customer needs

Limited and inadequate budget allocations

The adoption of and adherence to the philosophies: 'we have a better mousetrap' / 'build it and they shall come mentality'

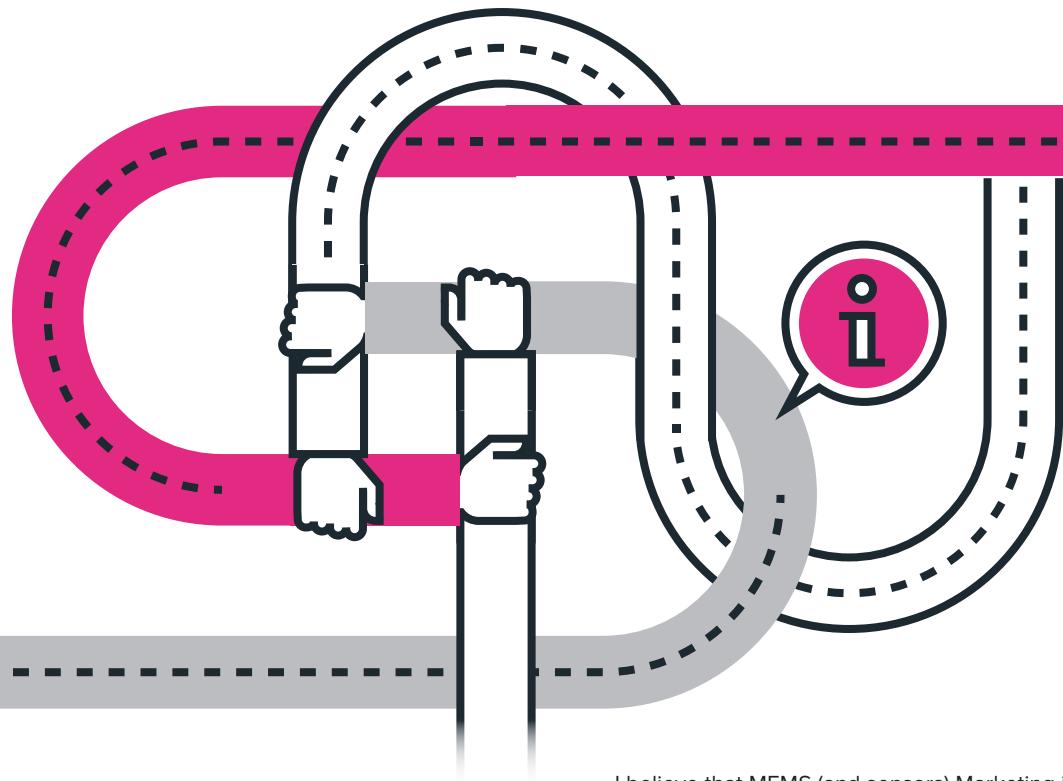
Basic indifference to the value of marketing to the ultimate success of the organisation

MEMS/sensors marketing certainly plays a critical role in the initial and final phases of the MEMS/sensors commercialisation process as noted in figure 1 of Reference 1.

Market research

MEMS Market Research had received average grades and in 2010 received its highest of A-. The bad news is that it has dropped to a grade level of B- for the last two years. I believe that the major problem with MEMS market research is that the firms that follow the MEMS market have tended in the past couple of years to primarily address the highest volume market, i.e. mobile phone and with little to no focus on other market sectors including automotive, industrial, medical and military aerospace. The sad thing is that there are only a handful of companies addressing the high volume mobile phone market; what are all the other MEMS suppliers to do when they require accessible published reports for their market? The answer appears to be: purchase custom market research reports. Until 2009, the automotive market sector was the largest MEMS application. Several companies have done a good job in addressing this sector and especially Strategy Analytics, IHS and Gartner Research. With the rise in the wearables and IoT markets, several new research firms are becoming involved in tracking the MEMS/sensors markets including IDTechEx, Lux Research and Markets and Markets

However, I believe that there is a major problem with the MEMS/sensors industry and that MEMS (and sensors) marketing is an oxymoron; several of my market research clients requested that I undertake market research after they have launched the product, rather than before where the inputs could have been judiciously used for product definition, pricing and competitive positioning activities. The good news is that not all of my clients have taken this 'reverse marketing' approach. Rather they adhere to the commercialisation process (figure 1) and had me conduct extensive, person to person/ interview-based market research with many potential buyer influencers as the first step in the product commercialisation process. The results of this approach has been quite successful. My enlightened clients adopted a different approach to product definition from the typical MEMS/sensor suppliers. But why is this so unusual? I believe that the reason for this is simple: most MEMS companies are run by 'techies' and 'techies' believe that they know what the market needs without asking the market and that formal market research is a waste of time and money and this is a big mistake. The axiom 'build it and they shall come' is truly erroneous. Let's hope that time will change this and that MEMS/sensors market research will become omni -present, omni-powerful and at will be at the foundation of the product development process.



Conclusions/Summary

MEMS marketing (as well as I believe sensor marketing in general) is plagued by a technology push versus applications pull mentality primarily driven by technology engineering management. I believe the poor grades in 2009 and 2010 were greatly influenced from significantly reduced promotion and marketing budgets as a result of the depressed global financial situation during that time. The good news is that the grade has steadily increased from C to B- over the past four years. Based on my 30 plus years of experience consulting for sensor and MEMS companies including NovaSensor, Measurement Specialties (now TE Connectivity) and SiTime, it has been demonstrated by measureable/quantifiable criteria that a marketing programme including integrated marketing communications (iMARCOM) that has been well-planned and properly resourced from a people and finance perspective can return large ROI's on management's investments. (Case studies to be found at www.rgrace.com). Specific elements a.k.a. 'tactics' in iMARCOM in these marketing include social media, webinars, white papers, trade show participation, public relations, media advertising and a myriad of other marketing communications tools. The strategy for the iMARCOM programme must be driven from the results of the front-end market research.

I believe that MEMS (and sensors) Marketing is an oxymoron and that much of valuable market research is being done by the equipment suppliers and many of the established MEMS market research and in the words of my colleague Dr. Janusz Bryzek in his Trillion Sensors Initiative [4] 'market research organisations tend not have the vision to look into the future for new and emerging applications and are just projecting data on current applications, and that is why we are developing the Trillion Sensors Roadmap to help alleviate this problem'.

Most importantly, I believe that MEMS/sensor companies do not have to have incredibly complex and expensive marketing programmes; they just need to better than the 'next guy' and the 'next guy' is not doing such a great job. This translates to making judicious investments in marketing programmes, especially iMARCOM, targeted to the right audience(s) which will be highly leveraged and able to create competitive advantage, and as such, a great opportunity for those that embrace it.

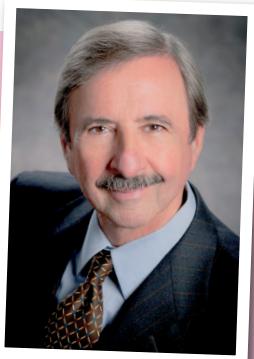
References:

- [¹] R. Grace, MEMS Commercialization: From the Lab to the Fab, *MEMS Technology Review*, Issue 2, No. 1, March 2012.
- [²] R. Cooper, *Winning with New Products/Accelerating the Process from Idea to Launch*, Perseus Publishing, 2001, 425 pp.
- [³] R. Grace, Barriers to the Successful Commercialization of MEMS: The 2011 MEMS Industry Commercialization Report Card, *Commercial Micro Manufacturing International*, Vol. 5, No. 4, September 2012.
- [⁴] J. Bryzek, R. Grace; The Trillion Sensors Initiative; *Commercial Micro Manufacturing International*; Vol. 7, No. 1; July 2014.



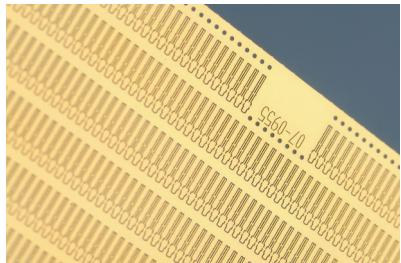
**Most importantly,
I believe that
MEMS/sensor
companies do
not have to have
incredibly complex
and expensive
marketing
programmes; they
just need to better
than the 'next guy'
and the 'next guy'
is not doing such a
great job.**

Roger Grace is President of Roger Grace Associates of Naples Florida, a marketing consulting firm that he founded in 1982, specialising in the commercialisation of MEMS. His firm provides business development, custom market research, market strategy and integrated marketing communications services to high tech clients worldwide. He has published over 20 articles in industry publications, organised and chaired over 50 MEMS technical sessions and conferences and is frequently quoted in the technical and business press as a MEMS industry guru. He was a visiting lecturer in the School of Engineering at the University of California Berkeley from 1990 to 2003. He holds BSEE and MSEE (as a Raytheon Company Fellow) degrees from Northeastern University where he was awarded the 'Engineering Alumni Engineer of the Year Award' in 2004.



www.rgrace.com

The Electroforming/Industry matchmaker



Every industry is different. Companies therefore face very specific, unique challenges which result in needs that cannot be compared to other companies or industries. Electroforming is a method to produce metal parts by precise deposition of metals onto patterned substrates. Its uniqueness is that you can grow metal parts atom by atom, providing absolute accuracy and high aspect ratios. For which specific challenges of the industry, electroforming can be a highly suitable solution?

Once you've discovered the benefits of electroforming, a whole new world of opportunities opens up. What if you could produce, atom by atom, stress- and burr-free precision metal parts with micron scale accuracy? It would give you the opportunity to raise the bar on precision, tolerance, cost-effectiveness and the capability to withstand higher temperatures.

Semiconductor and electronic components

Industries that are in need for very small and precise electronic components, such as the semiconductor industry find a great match in electroforming. For example the use of electroformed electronic components during printed circuit board assembly and of high quality electroformed test contactors during the electrical device validation.

Test contactors are used to determine the performance of electrical devices like microelectromechanical systems (MEMS), sensors, microcontrollers and integrated circuits. The probes are used in for instance the semiconductor and automotive markets for pre-launch validation and production tests. With dimensions as small as a few micrometers, they can be cost-efficiently mass produced by electroforming.

Electroforming is also highly suitable for:

- Automotive
- Aerospace
- Medical
- Optical Applications
- Defence
- And many others! Do not hesitate to contact us in order to discuss your industry challenges with us. Simply request a custom sample or send us your drawing.
www.vecoprecision.com