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Title: MARKETING AND COMMERCIALIZATION OF  
COMPUTATIONAL RESEARCH SERVICES

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# **Marketing and Commercialization of Research Services**

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**Los Alamos, New Mexico, USA**

**3 June 2001**

## **Abstract**

Physical and computational scientists and mathematicians in Russia's nuclear cities are turning their work toward generating profits from Western markets. Successful ventures require an understanding of the marketing of contract research as well as Western expectations regarding contract execution, quality, and performance. This paper will address fundamentals in business structure, marketing, and contract performance for organizations engaging in the marketing and commercialization of research services. Considerable emphasis will be placed on developing adequate communication within the organization.

## **Introduction and Outline**

This paper will focus on the following topics:

### **Business Structure**

- Costs per person per month or year
- Overheads

### **Organization**

- Contract monitoring and performance
- Team building
- Decision making

### **Marketing**

- Resources
- Categories
- Operations
- Marketeers

The paper is by no means an exhaustive study of this subject—such a study would take volumes, not just a few pages. It is the author's intent to present general concepts, with focus on a few examples, selected on the basis of his observations in working with his colleagues and friends in Sarov.

Two points of primary importance will be emphasized throughout: communication and customer focus.

## **Business Structure**

One of the first questions a potential customer will ask is, "How much will a person cost? If my project requires 10 people for a year, how much will it be?" This number must be determined by any organization that expects to do contract business. The costs per person, sometimes called the full time equivalent, or FTE, depend on all the following factors:

- How many productive employees? What are their salaries?

- Total overhead costs—fixed and per employee
- Depreciation schedule for production equipment—such as computer hardware and software
- Utilities
- Profit
- Business development (marketing) costs
- Salaries for non-productive people (CEO, secretaries, etc.)
- Cash flow, taxes, space costs, etc.

Other than salaries for people actually engaged in work on the contracts, these costs are all part of “overhead”, that is they are overhead costs—they are necessary but do not generate any income for the company. Only the working scientists, mathematicians, and engineers do this. It is therefore very important to minimize the overhead costs, because this will be important in your competition with other Russian companies.

One approach is to outsource as many of the overhead functions as possible to someone with experience in providing the overhead services. For example, we have encouraged the SOCC, now a separate State Unitary Enterprise, to outsource many of their overhead functions to IRSF VNIIEF, who has gained considerable experience over the last several years.

It should be noted that most companies will ask to see a breakdown of the overhead costs. They may note, as Motorola did with the SOCC, that the overhead costs will represent a larger fraction of the total costs per FTE than is typical for a Western company. This is not a problem, because the total costs for overheads per FTE is still lower than in the West. But the fraction is high because some overhead costs—such as replacing computer hardware and software—are the same or even more than costs in the West.

## **Organization**

### Top Level Management and Contract Performance

The three most essential people in a contracts research organization are the chief executive officer (CEO) or director, the person responsible for monitoring contract progress and performance, and the director of marketing. The importance of the CEO is obvious—he determines the vision for the enterprise and provides leadership, and he also establishes the culture.

In a contract research organization, the contract monitor is basically responsible for the organization’s reputation. The reputation depends on completion of contracts on time and within cost, high quality deliverables that provide exactly what the customer needs, and excellent communication and interaction with the customer during execution of the contract. The contract monitor must make sure that all this is accomplished. This requires very good communication within the organization, as well as the development of a strategy for executing each contract project, which itself requires that the statement of work (SOW) is clearly understood by all. When progress has slowed or a problem has developed—as will happen, the contract monitor must know immediately. Only then can everyone work together to resolve the problem and get the work back on track.

Regarding contract performance, the contract monitor must understand what training and certification is required to perform the tasks involved in a contract project. He must

know the relevant industry standards, such as ISO 9000 or other standards that the customer may expect to be employed in performing the work. The deliverables must be “user friendly,” which requires that the workers learn the capabilities and needs of the customer, who is the end user, and that interfaces in software must be tailored to suit those needs. The objective in all this is not to satisfy the customer, but to “delight” the customer—this is what will establish your reputation and bring the customer back for additional contracts.

The marketing director is sometimes called the “rainmaker”, because he brings new business into the enterprise. As such, he is often the first member of the enterprise that the customer meets, and his success or failure will often determine whether the enterprise has any further opportunity with a specific customer. Marketing is such a fundamental part of contract business that a later section is devoted entirely to it.

These three—CEO, contract monitor, and marketing director—must work together very effectively if the enterprise is to be successful. Together they must develop the business forecast, that is, how much business will the enterprise have at any given time, how many salaries can be paid? Contract research enterprises are like a train headed for a cliff at full speed. The train crashes over the cliff when the last invoice on the last contract has been paid. Obviously, continuing to secure contracts is essential; new contracts move the cliff farther ahead in time. The business forecast is a primary indicator of the health of the enterprise.

### Team Building

Building solid teams capable of effective teamwork is central to successful performance on contract projects. Tom Peters<sup>1</sup>, coauthor of “In Search of Excellence”, found that two elements are essential for outstanding personal performance:

- Each person believes they are a valued member of an important team
- Each person has some control of his own (professional) destiny.

The first element refers to confidence that the individual is valuable to the team as well as a shared belief that the work of the team is important. The second element indicates that individual team members should have input to how the work, especially their own work, will be accomplished. Two processes that impact these elements will be described briefly.

First, in building the team it is very important to have a balance of people with not only the necessary technical skills, but also a balanced mix of personalities to enable effective teamwork.

Mankind has been interested in human personality for millennia. Virtually all attempts to classify personality traits have been four dimensional, that is, there have been four “basis vectors”, and each individual personality represents some linear combination of the four. The Greeks spoke of temperaments derived from four gods—Apollo, commissioned to give man a sense of spirit, Dionysus to teach man joy, Prometheus to give man science, and Epimetheus to convey a sense of duty. The four temperaments of Hippocrates included sanguine, phlegmatic, choleric, and melancholic, coming from the four bodily fluids. The phlogiston theory considered all to be composed of admixtures of earth, air, fire, and water. Similar to selecting spherical rather than Cartesian as the basis vectors of

choice for considering the hydrogen atom, we might choose the DiSC<sup>®</sup> system<sup>2</sup> as a useful set for team building. The basis vectors are:

**Driver/directive**

- Keeps whole enterprise focused on the primary goal; tends to be insensitive to others feelings
- Virtually every general, admiral, and CEO have strong “D” components

**Influence/inspiration**

- Convinces others to work shoulder-to-shoulder toward the goal; good initiator but often not a good finisher
- Teachers, charismatic leaders are often strong “I”

**Steadiness**

- Likes to concentrate on a single well-defined problem—his problem; works well in a team
- Most scientists and mathematicians have large “S” coefficients

**Compliance**

- Prefers working to ensure compliance with a set of standards; keeps the rest of the team in line with rules and law but tends toward bureaucracy
- Accountants and economists are strong “C”

All four components represent strengths as well as weaknesses; all four are necessary for successful team execution of a project.

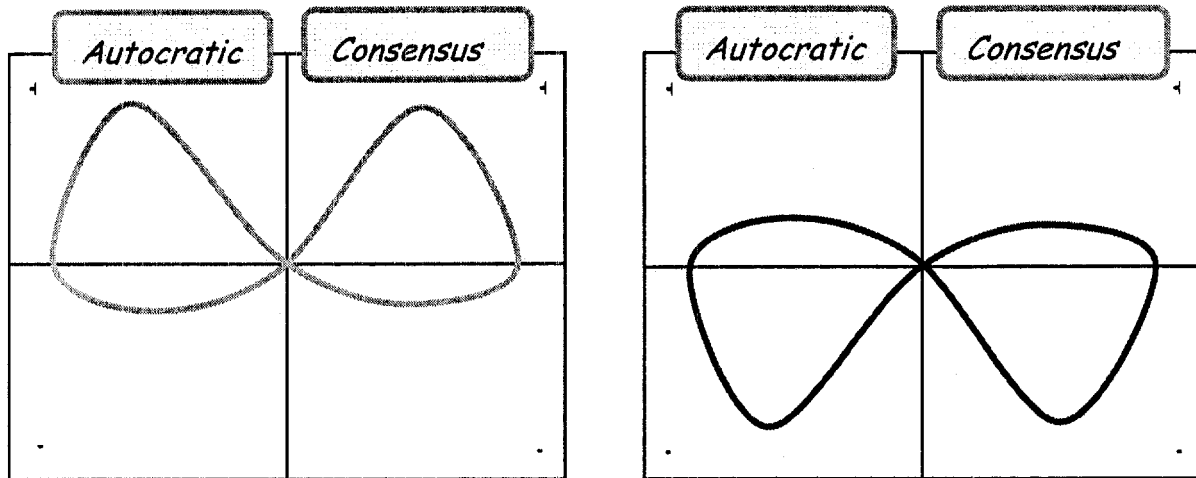
**Decision Making**

This section will describe the difference between problems, which can be resolved, and polarities, which must be managed<sup>3</sup>. An example of a polarity is the choice between autocratic and consensus decision making. This example is selected because consensus decision making allows individual team members to make input into the decision, and therefore gives them influence regarding how the project is performed and how their own work must be accomplished. Autocratic decision making involves decisions made solely by the leader or “boss,” consensus decisions involve input from everyone.

The point of polarity analysis is that both poles of an issue have strengths and weaknesses, and managing a polarity involves maximizing the use of the strengths of each pole while minimizing the weaknesses. For example, one can construct a table of strengths and weaknesses for autocratic versus consensus decision making:

<i>Autocratic</i>	<i>Consensus</i>
<div>+</div> <ul style="list-style-type: none"> <li>• <i>Decisive</i></li> <li>• <i>Efficient</i></li> <li>• <i>Clear responsibilities</i></li> </ul>	<div>+</div> <ul style="list-style-type: none"> <li>• <i>Broad support</i></li> <li>• <i>Group wisdom</i></li> <li>• <i>Synergy</i></li> <li>• <i>Enthusiasm</i></li> </ul>
<ul style="list-style-type: none"> <li>• <i>Lack of support</i></li> <li>• <i>Individuals feel they have no input</i></li> <li>• <i>Lack of enthusiasm</i></li> </ul> <div>-</div>	<ul style="list-style-type: none"> <li>• <i>Indecisive</i></li> <li>• <i>Time consuming—too many meetings</i></li> <li>• <i>Responsibilities uncertain</i></li> </ul> <div>-</div>

Typically, organizations and teams move through a trajectory as indicated as on the following two diagrams:



For example, the team may begin in the upper right quadrant with decision making by consensus. Initially everyone is please and feels that others have listened to their input. They are much more inclined to support decisions positively, even if the ultimate decision does not agree with their original position. However, as time progresses, the inefficiencies in consensus decision making begin to drag down the organization. The trajectory moves to the lower right quadrant. In a healthy organization, this is quickly recognized, and the organization is flexible. It moves quickly toward autocratic decision making, and the trajectory moves to the upper left quadrant, as in the diagram on the left. In a less flexible organization, no one wishes to surrender their input in the decision making process, and the organization becomes stagnated, stuck for a long time in the lower right quadrant. Clearly, organizations should try to follow the left diagram, spending as much time as possible in the upper quadrants when managing polarities.

In reality, this is example of autocratic versus consensus decision making is extreme. Of course, minor day-to-day decisions should be made quickly by the CEO or delegated to another. Consensus decision making will be reserved for major decisions that affect everyone. Furthermore, often a true consensus—agreement by everyone—is impossible to reach. In such a case, the leader must hear all the arguments and positions, reach as close to consensus as possible, then make the decision. Usually, a wrong decision is better than no decision at all because the organization moves forward, and the fact that the decision was wrong becomes obvious, allowing corrective action. But with no decision, the organization is “dead in the water”—no one can move forward.

A few other examples of polarities include individual versus team, planning versus action, critical analysis versus encouragement, centralized responsibility versus decentralized, stability versus change, individual responsibility versus organizational responsibility. Clearly, several are closely related to the decision making polarity.

<sup>1</sup> Thomas J. Peters and Robert H. Waterman, Jr., *In Search of Excellence*, Harper and Row, 1982.

<sup>2</sup> Inscape Publishing

<sup>3</sup> Barry Johnson, Ph. D., *Polarity Management*, HRD Press, 1992.

## Marketing

Marketing capability for VNIIEF, Avangard, and the emerging enterprises in Sarov is essential to the success of business ventures. This is why marketing planning is part of the business development task for the Sarov Open Computing Center. With the development of the Sarov Technopark and the desire to find Western investors, customers, and business partners for ventures in the Technopark and elsewhere in Sarov, it is timely to consider how to approach the development of a broadly based marketing capability in Sarov.

Marketing is difficult. Because Sarov is a closed city marketing will be even more difficult than usual. Therefore the following elementary notes are presented as a short introduction.

## Marketing Resources

- Marketing resources for the enterprises in Sarov comes from profit of the enterprises, whatever US provides through NCI or other programs, and whatever funds that VNIIEF, Avangard, or other organizations in Sarov (Duma, VNIIEF Conversia, etc.) can set aside. For a US company marketing the US government, marketing resources are determined by bid and proposal funds, which are determined by government regulations. However, virtually no work in Sarov (or other nuclear cities) will be performed for the US government in the same manner as US companies.
- Marketing resources are needed for:
  - Training—in marketing and to develop English skills. (English is the global business language. With English skills, one can market anywhere in the world.)
  - Proposal writing
  - Creation of marketing materials—brochures, presentations, CD ROMs, etc.
  - Advertising—creation of website, booths at trade shows, etc.
  - Travel—a great deal is required, and most will be to the West, which is very expensive
  - Salaries for marketeers

## Marketing Categories

Marketing separates into four categories—old/old, old/new, new/old, new/new

- Old/old: Old business, old customer
- New/old: New business, old customer
- Old/new: Old business, new customer
- New/new: New business, new customer

The following table indicates the fraction of marketing resources devoted to each type and the resulting business generated. The data are generally typical for US companies. Interpretation is provided below the table.

Business Type	Fraction of Marketing Resources Devoted	Fraction of Business Generated
Old/Old	10%	40%
New/Old	20%	25%
Old/New	20%	25%
New/New	50%	10%

- Old/old: In this case the customer is well-known, and also knows very well the product or services being marketed, so the marketing procedure is straightforward and relatively easy. Most of the marketing effort can be performed during the normal course of interactions with the customer to fulfill existing contracts, and is therefore very inexpensive.
- New/old: Once again, the customer is well-known to the marketer, and, if the business relationship has been successful, will be receptive to the new business concepts being presented.
- Old/new: In this case the customers are new, but the business is old and familiar to the marketer. Further, the marketer's company has an established reputation in this business area.
- New/new: In this case, the customer being marketed knows neither the business nor the company doing the marketing. Furthermore, the marketer has little knowledge concerning the customer and little experience marketing the business. This, clearly, is the most difficult marketing situation. Unfortunately, this type will represent nearly 100% of the marketing for Sarov for the near future.

#### Marketing Organization

- Whatever organization is chosen for marketing, it should not be called a Marketing Center—this will imply to those in Sarov that this is where they go to get marketing done. It does not work that way. Marketing is not performed in Sarov—it is only accomplished when marketers from Sarov are with the customer, wherever the customer may be. The most important marketing interaction is the initial interaction with the potential customer, because if this marketing attempt fails, no opportunity for investment or sales will follow with that customer—there will not be a second chance. Except for very unusual situations, the first marketing interaction will never take place in Sarov. It would be much better to call the marketing organization a Marketing Office, Marketing Support Office, or other name.
- The marketing office can supply staff support—a place for proposal writing, preparation of multicolor pamphlets and brochures, CD ROMs, etc. But the office we are describing here should not recreate capabilities already available in Sarov—this is one major reason that the people in Sarov have given for not wanting an IDC. Sarov has a print shop, VNIIEF International Division, VNIIEF

Conversia, FICCA, IRSF VNIIEF, and the coming international center at Avangard that Y. K. Zavalishin will head. These can supply most of the business equipment functions required for marketing.

- One question that must be addressed is whether a single office can cover all of Sarov, or whether separate offices are required for the SOCC, other VNIIEF activities, Avangard, etc. Help has been requested from the NCI program for a marketing office for Avangard as well as for VNIIEF Conversia. There could be a single office in Sarov—or, if there are separate offices, one might be located with VNIIEF Conversia and one with the new Avangard International Center.
- This office does not need a board of directors, and should not have one. As the next paragraph points out, it is not a board of directors that must control the marketing resources. Further, having US representatives meeting in Sarov as members of such a board of directors is a waste of time and money. As mentioned before, little if any marketing will take place in Sarov. As will be described below, US participants are essential as mentors, “coaches”, and helpers for the marketing of Sarov in the US and other Western countries. But this help should be provided not in Sarov but in the US, with US participants taking Russian marketeers to visit potential customers in the US. For US personnel to visit Sarov only to participate in marketing discussions truly would be nuclear tourism. If money must be spent for travel for discussions, use it to bring marketeers to the US from Sarov, so that they may market potential customers on the same trip.
- Whether Sarov has a single marketing office or two or more offices, a principle marketeer is required for each relevant concern. In Sarov, this means at least one for VNIIEF and one for Avangard and perhaps a separate one for SOCC; however, the author will suggest otherwise. It might be different for other nuclear cities.
- In a Western business, the Vice President of Marketing always sits close to the President or CEO, because it is the President or CEO that has the responsibility for the success of the company, and must therefore control the (always limited) marketing resources, as marketing is vital to the enduring success of the business. Similarly, in Sarov it is Directors Il’kaev and Orlov who have the responsibility, bestowed upon them by Minatom, for conversion of their organizations. They are the relevant CEOs, and they must have the primary authority regarding the use of their marketing resources. They must choose which business ventures are the most deserving of marketing attention and resources. For these reasons, the principle marketeers must be tied very closely to Directors Il’kaev and Orlov—that is, they should have ready access, perhaps through the deputies for investment or deputies for international relations. The other marketing staff will not require direct access to Il’kaev or Orlov.
- The reason for separate marketeers for the organizations is fundamental to marketing—one must market from the standpoint of market pull, not technology push. This means that the marketeers must understand the needs of the particular customer being marketed, and let that “pull” the discussion, rather than “pushing”

the discussion with the favorite technology of the marketer's organization. The marketers will have to know extremely well the capabilities of the organizations they represent. They must be empathetic listeners and good English speakers, for they will have to elicit from potential customers the market pull—that is, the customer's needs—and find a match with the capabilities of the marketer's organization to provide a service or a product.

- Very few of our laboratory experts, either US or Russian, understand this concept. It has been the strong tendency of Los Alamos scientists to want to find support for their own favorite technology, rather than learning what the market might need. Similarly, when the Los Alamos—Savannah River team visited Sarov in December, 1998, at the beginning of the NCI program, they were presented with 56 proposals of VNIIEF ideas for funding under NCI. Some 50 of the 56 were technology push, which would have been unsuccessful in the market.

#### Selection of Marketing Personnel

- The marketers must be technically adept and well informed concerning the company or parent organization's capabilities.
- They also must have English fluency, as English is the global language for business.
- The marketing personnel should be capable of building their own communication networks within the markets of interest.
- They must also be willing and able to travel frequently and for extended periods, since seeing many different customers on a trip is a more efficient use of precious marketing funds.
- Furthermore, it will be essential to obtain the assistance of marketing experts from US industry to help mentor the marketers from Sarov. For the SOCC, we held the marketing workshop in Austin one year ago, and initiated discussions with David Gibson of IC<sup>2</sup>. With FY01 money we hope to enlist Gibson's help with marketing the SOCC in the US.

#### **Concluding Comments**

As mentioned in the introduction, the purpose of this paper is to present a broad brush with emphasis on essential points as well as on presentation of several comments intended to stimulate thinking and discussion in Sarov. Two of the most critical elements are communication and customer focus.

An additional approach is to strive to provide open communication throughout the organization. The CEO and other leaders can make information about business developments available to everyone. Regular seminars on technical process also serve to keep everyone informed, as well as to gain broader input regarding particular problems.

Customer focus requires the marketer's attention to customer needs—market pull rather than technology push. It also requires understanding of particular customer needs in the final product—part of contract performance.

# **Marketing and Commercialization of Computational Research Services**

*Presentation for*

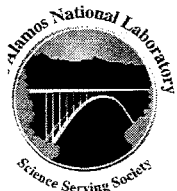
**Symposium in Honor of  
Andrei Sakharov**

***Sarov, Russia***

**14 – 16 June 2001**

**James W. Toevs**

***Los Alamos National Laboratory***



# Topics

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## -Business Structure

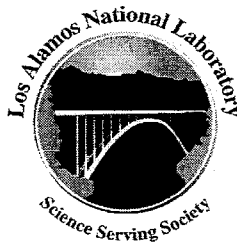
- Costs per person per month or year
- Overheads

## -Organization

- Contract monitoring and performance
- Team building
- Decision making

## -Marketing

- Resources
- Categories
- Operations
- Marketeers



# Business Structure

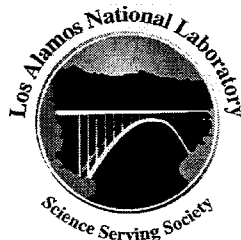
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Costs per person (Full Time Equivalent, or FTE) are calculated from:

- How many productive employees? What are their salaries?
- Total overhead costs—fixed and per employee
- Depreciation schedule for production equipment
- Utilities
- Profit
- Business development (marketing) costs
- Salaries for non-productive people
- Cash flow, taxes, space costs, etc.

Minimize your overheads

- Outsource to specialists (IRSF - VNIIEF? VNIIEF Conversia?)
- Your overhead costs as a fraction of FTE costs will be higher than for Western companies—this is not a problem



# Organization

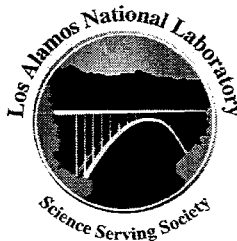
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## Key Personnel—essential for success

- Executive Director—determines the vision and provides leadership
- Marketing Director—the “rainmaker”, he brings in business
- Contract Monitor—performance determines reputation

## The Business Forecast

- A contract research business is like a train rushing toward a cliff
- The train crashes over the cliff when the final invoice on the last contract has been paid
- The key personnel must work together to secure contracts, moving the cliff farther out in time
- The location of the cliff always must be known



# Contract Monitoring and Performance

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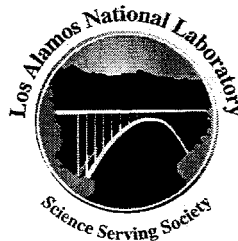
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## Monitoring

- The Statement of Work must be clearly understood by all
- Tasks must be completed on time and within budget
- A strategy must be developed for each project to accomplish this
- Problems will arise and communication is essential—leaders cannot help resolve problems if they do not know they exist!

## Performance

- Training and certification—what is required to perform the tasks?
- What are relevant industry standards? Does your customer expect ISO 9000 or other standards to be employed in your work?
- “User-friendly”—know the capabilities and desires of the end user - your customer - and tailor user interfaces to fit his needs



# Team Building

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In "In Search of Excellence," Tom Peters pointed out that two elements are essential for outstanding personal performance:

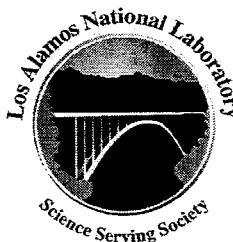
- Each person believes they are a valued member of an important team
- Each person has some control of his own (professional) destiny

Two elements that help create such an environment are

- Building a successful team
- The decision making process

Building the team: a balance of personality types is essential

- Virtually all approaches to personality analysis are four dimensional, that is, have four "basis vectors"—Greek, Classical, Phlogiston, modern
- We are all linear combinations of the four
- The following four, called the "DiSC<sup>®</sup>" system, are useful for team building in a business situation



# Basis Vectors for Team Building— the DiSC® System

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## Driver/directive

- Keeps whole enterprise focused on the primary goal
- Virtually every general, admiral, and CEO have strong “D” components

## Influence/inspiration

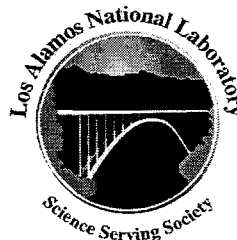
- Convinces others to work shoulder-to-shoulder toward the goal
- Teachers, charismatic leaders are strong “i”

## Steady

- Likes to concentrate on a single well-defined problem—his problem; works well in a team
- Most scientists and mathematicians have large “S” coefficients

## Compliance

- Prefers working to ensure compliance with a set of standards
- Accountants and economists are strong “C”



# Polarities vs. Problems—Decision Making

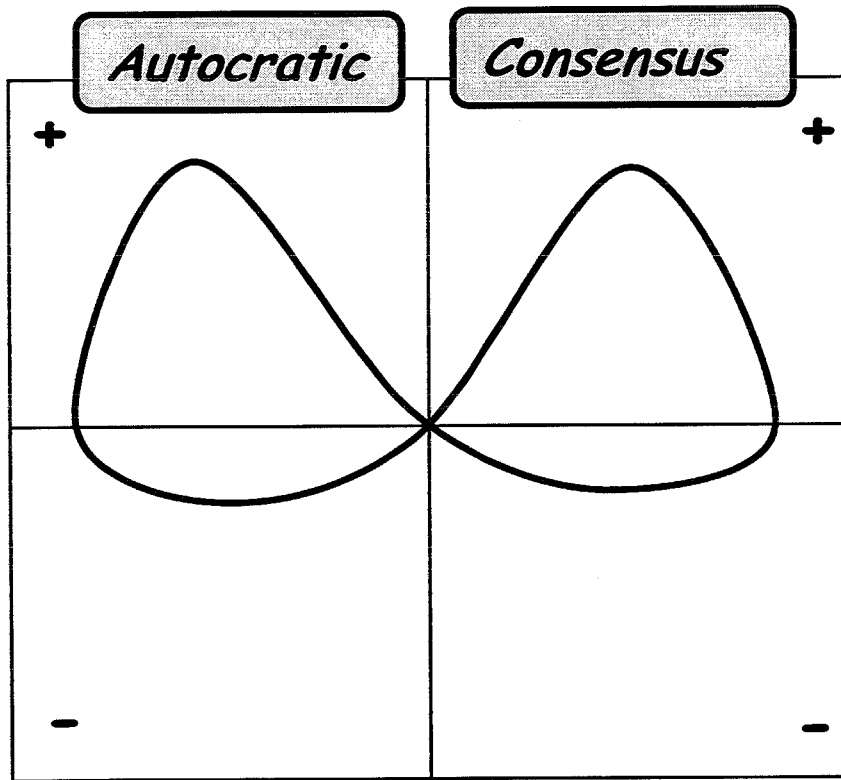
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- Problems can be resolved
- Polarities must be managed—each pole offers benefits and disadvantages
- An example: Decision Making—autocratic or consensus?

<i>Autocratic</i>	<i>Consensus</i>
<div><div>+</div><ul style="list-style-type: none"><li>• <i>Decisive</i></li><li>• <i>Efficient</i></li><li>• <i>Clear responsibilities</i></li></ul></div>	<div><div>+</div><ul style="list-style-type: none"><li>• <i>Broad support</i></li><li>• <i>Group wisdom</i></li><li>• <i>Synergy</i></li><li>• <i>Enthusiasm</i></li></ul></div>
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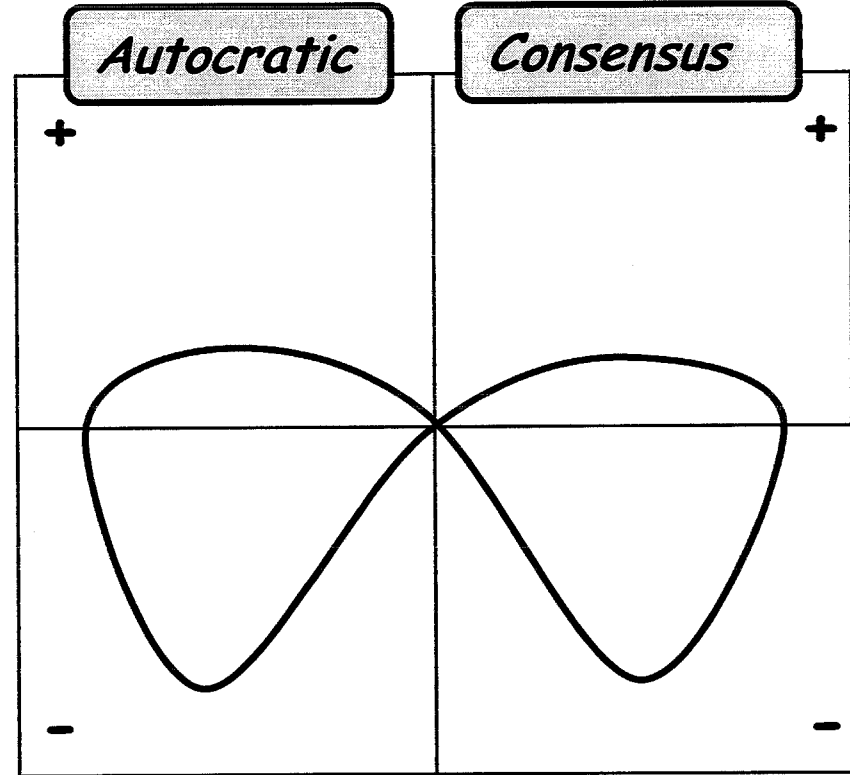
# Managing Polarities

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## Well-Managed Polarity

- Organization is flexible, can accept change, switch polarity quickly
- Maximum time spent in positive regions



## Poorly-Managed Polarity

- Organization is rigid, resists change
- Gets stuck in negative regions

# Marketing in Sarov

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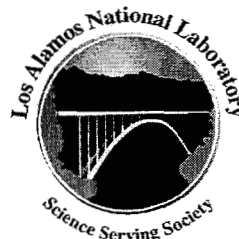
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## Sources of Marketing Resources for Contract Research Organizations

- Marketing is an overhead cost
- Funds come from cash flow, unlike US companies
- Marketing involves travel, so costs will be a larger fraction than for Western companies

## Marketing resources are required for

- Training—in marketing and to develop English skills
- Proposal writing
- Creation of marketing materials—brochures, presentations, CD ROMs, etc.
- Advertising—creation of website, booths at trade shows, etc.
- Travel—a great deal is required, and most will be to the West, which is very expensive
- Salaries for marketers



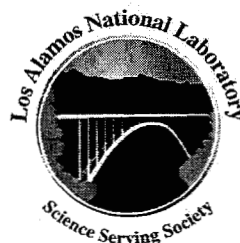
# Marketing Categories

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- Old/old: Old business, old customer
- New/old: New business, old customer
- Old/new: Old business, new customer
- New/new: New business, new customer

Business Type	Fraction of Marketing Resources Devoted	Fraction of Business Generated
Old/Old	10%	40%
New/Old	20%	25%
Old/New	20%	25%
New/New	50%	10%

*Typical data for US companies*



# Marketing Operation

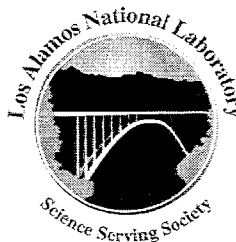
JWT 5/31/01

Once again, customer focus is essential

- One cannot market in Sarov—marketeers must travel to the customer—and one cannot market every customer
- Marketeer must learn the customer's needs
- Marketeer must present examples that show his company's qualifications and capabilities that can address customer needs
- Marketeer must avoid presenting technology concepts hoping the customer will buy—marketing is not a research proposal!

Marketing is Market Pull, not Technology Push

Communication and Customer focus are keys to success



# Marketing Organization

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JWT 5/31/01

## Marketing Office

- Provides office space for marketers (when at home) and support staff, not a Center where people come for marketing
- Use International Divisions, VNIIEF Conversia support where possible

## Organization within VNIIEF, Avangard, etc.

- Marketeers must represent parent organization
- They are the first people most customers will meet
- Therefore they must be close to Directors

## Marketeers

- Must be technically broad to represent organization, and able to form information networks within markets
- Must be fluent in English, the global business language
- Must expect to travel frequently, for long times

