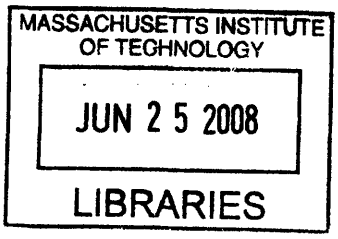
DEVELOPING A GLOBAL STRATEGY FOR A BRAZILIAN ENGINEERING SERVICES PROVIDER

by
ABNER LIMA de OLIVEIRA
B.S. Civil Engineering
University of Brasilia, 1997

Submitted to the MIT Sloan School of Management in
Partial Fulfillment of the Requirements for the Degree of
Master of Science in the Management of Technology



At the
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ABSTRACT

The Delta Model framework is used in this work to assess a engineering services provider's current and desired level of customer bonding and define a Strategic Plan towards a global operation. Several other frameworks serve as support for the setting of the strategic thrusts, helping select which competencies to export, where to operate and what to incorporate in each location. This thesis aimed at leveraging the company's current localized success to achieve a more sustainable position in today's economic world, more and more borderless and yet stage of important sources of geographic arbitrage and competitive advantage.

Thesis Advisor: Arnoldo C. Hax

Alfred P. Sloan Professor of Management

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DEVELOPING A GLOBAL STRATEGY FOR A BRAZILIAN ENGINEERING SERVICES PROVIDER

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Massachusetts Institute of Technology
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1. Introduction

In a networked economy, national boundaries are no longer suited to confine a company's strategy or vision. A strategic positioning that crosses borders, building on location arbitrage, constitutes source of a superior performance to the enterprise.

The present work aims at setting a comprehensive strategy for a leading Brazilian engineering services provider aiming at an expansion to foreign markets. The main motivations for this goal are listed below:

- The home-base market is not negligible but is, by definition, limited. The company has the ambition of capturing a share of the global expenditures in the industry;
- Foreign direct investments are growing steadily (Brazil was just awarded the S&P Investment Grade). This is likely to bring world-class competition to the company's doorstep. Success in an advanced market will help secure long term dominance in the home location;
- The internal market portrays heavily oscillating demand, forcing the company to bear increasing risk. The addition of more stable markets to the company's portfolio is likely to hedge the home demand risk;

This goal is supported by the following existing drives:

- The company's technologic status is au pair with the leading companies in the world;
- The company has in-house, world-class leadership and management to carry out the expansion;

- Currently, the company can self-finance the expansion;
- The current operation can scale to serve new demands, with adjustments;

The thesis is organized in four parts: Chapters 1 and 2 aim at the introduction of the structure of the work and the frameworks used; Chapters 3 and 4 dissect the current operation under the Delta Model's lenses; Chapter 5 discusses the why, what, where and how to expand globally and Chapter 6 presents the proposed detailed strategy for the global expansion.

2. Methodology

In order to achieve sustainable success in its internationalization drive, the company is looking to develop a winning strategy, composed of:

- A careful assessment of the home-base strategy to enable a close alignment with the international growth plans. The Delta Model will be used to assess the current level of customer-orientation, assess hidden opportunities and envision desired competencies guiding the whole organization (and not only a part of it) towards superior customer bonding.
- The analysis will be complemented by the application of the Lessard's RATs framework to define which competencies are applicable in the global marketplace;
- A study of the home-base intrinsic conditions that might hinder the expansion initiative with the goal of defining actions to offset those shortcomings (Porter's diamond). The "virtual diamond" will be used to determine which complementary resources should be sought abroad.
- A careful evaluation of which advanced markets are more prone to an approach, given cultural, administrative, geographic and economic gaps with the home-base market. Ghemawat's CAGE distance framework will guide the assessment;
- The development of a detailed strategic agenda to enable the global expansion.

2.1. INTRODUCTION TO THE FRAMEWORKS

This chapter describes the main characteristics of the frameworks used. Far from constituting an extensive review of the available bibliography on the matter, it will provide the reader with a glimpse of this work's analytic mechanics.

The Delta Model (Hax & Wilde II, 2001) introduced the premise that the only sustainable way to achieve superior market profitability and share is by seeking customer bonding. It expands the common product-centric approach to a customer-centric vision that is free from established perceptions of the customer's needs (notably the competitors') and opens a path for true innovation in the offerings. The Delta Model presents three possible strategic positioning options for the company (see Figure 1).

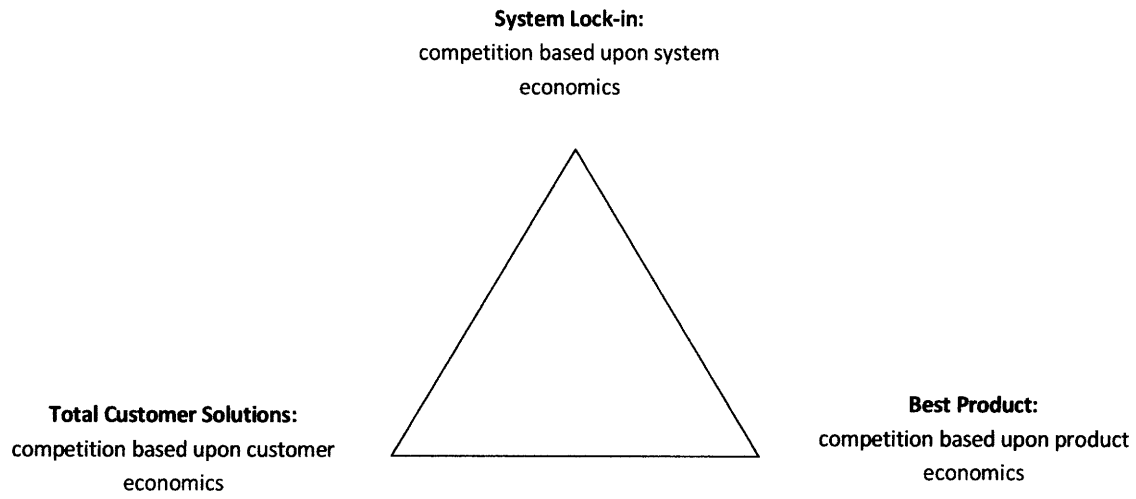

Figure 1 – The Delta Model strategic options (Hax & Wilde II, 2001)

Each position and its dimensions (Figure 2) are described briefly below:

- Best Product: the customer is attracted by intrinsic characteristics of the offering, which usually fall under one these two dimensions:
    - Low cost: providing the lowest cost, without any product differentiation. Usually unsustainable since low cost sources keep moving around from company to company;
    - Differentiation: while securing cost effectiveness, bringing about important differentiation in the offerings in order to enjoy profits that are superior to competitors'. This option is not immune from benchmarking, which results in thin sustainability
- Total Customer Solutions: the opposite approach from Best Product, enables the provider to create individual relationships with the clients and directly influence their economic value generation, requiring a deep understanding of the customer base. The following dimensions are possible:
    - Horizontal Breadth: the company covers entire spectrum of customer needs allowing it to market itself as a "one-stop-shop";

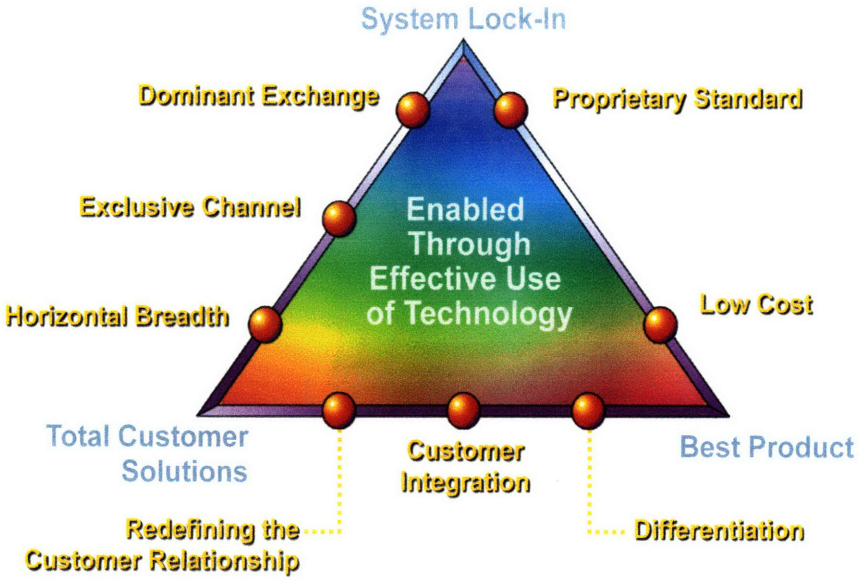

Figure 2 – The dimensions of the Delta Model Triangle (Hax A. C., 2007)

- Customer Integration: extending the offerings to replace or leverage tasks currently under the client's responsibility. Includes outsourcing but goes beyond by adding clear value through the application or transfer of specific knowledge (the company's bundle of competencies).

- Redefining the customer experience: it is enabled by a focus on the "experience of the customer" from the acquisition moment to the entire lifetime of the offering. Requires a complete customer segmentation and the capacity to offer a customized approach to each tier;

- System Lock-In: this position is available to the "extended enterprise" (the company, the suppliers, the customers and the complementors) which must seek at least one of the following dimensions:

    - Exclusive Channel: the company occupies a space where barriers exist in such an extent that they prevent competitors to try and access the customer base. This position is usually constrained by public policies;

    - Dominant Exchange: the company successfully puts in place an exchange interface with its client base that and locks competitors out. Requires the interface to be largely adopted relevant in terms of users;

    - Proprietary Standard: the least accessible of all the positions, is achieved when the company reaches a critical mass of complementors, whose offerings are meant to work together with the companys'.

The highly instrumental setup of the Delta Model Integrated Framework makes it suitable to a practical, hands-on strategy-setting process. The steps are summarized below:

- Customer Segmentation and Customer Value Proposition: identification, description and classification of the different customer tiers served by the company, the value proposition offered to each and untapped opportunities;

- The Bundle of Competencies: analysis of the existing and desired competencies of the firm;

- Mission of the Business: the statement of the existing and desired business dimensions of the firm;

- The Strategic Agenda: the list of the necessary and desired thrusts, based in the Mission, with the definition of components and leaders;

To better support the definition of a Strategic Agenda, the final product of this work, the following frameworks will be applied to Topocart's global expansion project:

- Lessard's RATs framework constitutes a strong complementor for the Delta Model analysis since it provides the grounds for assessing whether the existing and desired competencies are ***R***elevant to the new markets, ***A***ppropriable by the company in these new environments and ***T***ransferrable to the external locations.

- Porter's Diamond (Porter, 1990) acknowledges the importance of location components to the success of an internationalization venture, and puts together an assessment of a business' home-base capability through four dimensions – the "Diamond" – Factor Conditions, Context for Strategy and Rivalry, Demand Conditions, Supporting and Related Industries, and the need for adding competencies to offset potential shortcomings.

- Ghemawat's CAGE framework (Ghemawat, 2007) seeks to determine a weighted "distance" composed of Cultural, Administrative, Geographic and Economic (CAGE) factors in order to anticipate the degree of compatibility between the home-base and the desired new territory and, therefore, the internationalization initiative's chance of success.

3. Overview of Topocart

Topocart is a fast growing professional services company located in Brazil, with its headquarters in Brasilia, the nation's capital. Its business scope encompasses mapping, survey, engineering, urban planning and environmental studies.

Topocart was founded in 1991 by a retired Army colonel, Jorge Arteiro, to provide topographic survey services, in Brasilia, Brazil's capital. A graduate from the Army's academy, specializing in Cartography, he had led some of the most important mapping and infrastructure building efforts in Brazil, once responsibility of the Armed Forces. The company transitioned to its current stage in 2001, when the first photogrammetric job was taken. In 2003, it purchased its first mapping aircraft becoming self-sufficient in terms of cartographic production. Having grown four times since then, Topocart found itself thriving to find a coherent strategy that would leverage on its set of values and investment capacity to achieve a sustainable growth and reach the top of its market.

Currently, the company has 200 employees and offices in Brasilia, Rio de Janeiro, Fortaleza, Natal, Recife and Belo Horizonte. It operates primarily in three Brazilian regions (North, Northeast and Midwest) encompassing 19 of the 26 Brazilian states.

We are the most important player in our region of operation, which has been highly prioritized by government investment. In the Southeast (the richest states) we compete against strong players and a myriad of smaller offices. We have little penetration in the South, also an important pole of investment and development.

The majority of the company's revenues come from Mapping and Survey offerings, which also make the bulk of its competencies. Not coincidently, this is the field by which the company is most recognized.

3.1. MAPPING AND SURVEY

Mapping is one of the most ancient human activities, being tracked back to the Egyptians measuring their culture parcels before every high tide period of the Nile. The calculations helped preserve each owner's land's size and position even after the water had destroyed all material marks. Nowadays, although electronics, optics and computers revolutionized the methods and expanded the possibilities, the science is still based on the geometric principles developed centuries ago.

Customers looking for Mapping and Survey services usually need to recreate their working area in a computational environment, in order to execute decision-making, analysis, designs and plans. The main commonality is the need for very precise 3D representation of the existing features. Applications range from crop management to infrastructure design.

The business knowledge domain can be roughly described as follows:

- Topography: the great-great-grandson of the Egyptian geometry, employs high precision optics and laser beams to calculate angle and distances between significant points in the working area (for example, manholes, trees, buildings' corners) in order to determine their location and size. After some processing, the measurements are converted into absolute

coordinates and the features are graphically represented. It provides the most detailed and reliable results, but it's only feasible when applied to limited areas.

- Photogrammetry: it's based on the fact that the human brain is capable of composing a 3D environment from slightly different images fed to each eye. Special cameras assembled in airplanes cover the area of interest with overlapping pictures which, through complex spatial geometry calculations, "recreate" the reality in a high precision 3D model. This model is converted, through human interaction, into standardized graphics that depict what has been recorded on the photos. Ultimately, the photos themselves are corrected from their central perspective and composed into a seamless background which enriches the map presentation.

- Other remote sensors: Other meaningful geographic data can be obtained through an array of airborne or orbital sensors. The LiDAR emits a laser beam towards the ground and by measuring its travel time determines, with a myriad of high precision points, the shape of the surface, and its coverage. Satellites fly at an altitude of hundreds of miles and can record information in up to 2-feet resolution images, although with little or no 3D capacity.

- Geographic information systems: integrating the geographic data collected or generated into a client's processes and systems is the most promising activity in the business. The domain encompasses theories, practices, software and IT infrastructure. The internet and the client's existing database systems are commonly utilized as platform for the development of spatial applications that will add geographic intelligence to the end-user's business.

4. Strategic Analysis

The goal of the Strategic Analysis is to look at the company's current experience in its home-base market and identify the degree of customer bonding as well as untapped opportunities within its current business model. The conclusions drawn will serve as input to the global strategy setting process.

4.1. CUSTOMER SEGMENTATION

The first step was to collect data from the contracts of the past three years and define a segmentation pattern. The commonalities between clients became clear when we separated them by purchasing attitude and potential value-added by the firm. Five tiers were identified and their description is presented below.

4.1.1. Partner seeker

This customer (usually government institutions) is commonly involved in very long term policy implementations and is looking for reliable and flexible suppliers. The bonding with this client is the highest possible because our capabilities complement their lack of resources from the very beginning all the way to the final delivery. Informal consultations are made prior to the formal contract period with the goal of providing technical advice. The execution phase is usually prone to changes in specification and scope to which the company has to respond quickly in order to secure the deadlines and budget allocated, usually highly constrained in amount and time of use.

Although advantageous for both parties, this relationship portrays several hiccups, which restrain its potential:

- The bidding and contracting processes usually take an unpredictable amount of time to complete, during which policies or priorities might change. Cancellations of bids are not uncommon;

- Despite the amount of consultations prior to contracts, the decision-maker has no power to choose the actual provider, so the depth of the bonding is not directly connected to the actual number of awards, although participation in the discussion process gives a deep understanding of the client's needs, which yields better proposals, increasing our chances in the bid.

- The decision-makers' views not always translate into reality due to the large number of bureaucratic levels that the bidding process has to go through. It is not unlikely for a bid's published content to come as a surprise to its own author;

- The tenure of the decision-maker is determined by politics, so how "long-term" the relationship will really be is unpredictable. A constant effort to keep track of the changes and to repair the ties is necessary;

Business Dimensions	*Description*
Products	Mapping products (from photogrammetry) and in a lesser scale engineering designs, urban plans, cadastre databases, reports, and field surveys
Services	Informal technical advice regarding the specification and use of the data provided
Customer	Large organizations (mainly government)
Channels	Direct sale and bidding publishers
End Users	Program/project managers, subordinate institutions' personnel, designers, consultants and specialists
Complementors	None
Unique Competencies	• Breadth of offerings and cost-effective structure. • Widely recognized technical expertise and professionalism • Business orientation towards support functions prior to the execution

Table 1 – Business dimension of Tier 1 – Partner seeker

- There is an important gap between the client's and the company's knowledge, which constitute an opportunity for a long-lasting relationship with the institution, and one not so dependent on the individual views of its head people. However, this is hard to achieve due to the lack of a efficiency-seeking culture and a deep misalignment between the lower echelons (lifetime employees enjoying unrestricted tenure) and top management (politically-appointed managers).

Despite all these shortcomings, this tier lives up to its positioning in the triangle (see **Error! Reference ource not found.**) and is responsible for the largest retention and the majority of the revenues. The company's location, in the country's Capital, contributes to more streamlined consultations. These customers are likely to be locked-in once well-served and, while they cannot hire the company of their

choice directly, they become frequent advice-seekers, fact that translates into solid reputation for the company.

Customer Dimensions	*Description*
Experiences	Assistance in policy setting and the guarantee of delivering high quality, reliable and flexible data sets, in complete alignment with the institution's needs
Value Delivery Systems	A team of senior sales professionals and management working closely with the potential customer from the beginning.
Value appropriation	By the customer: • Smooth integration with a complex, specific body of knowledge; • Knowledge transfer on-the-spot, as needed; By the company: • Customer lock-in; • Higher margins and volume; • Reputation and "resume"

Table 2 – Value proposition for Tier 1 – Partner seeker

4.1.2. Total Solution seeker

Customers in this tier are usually private companies either investing or directly managing projects and programs which span a long-term schedule. Similarly to Tier 1's case, this customer extracts value from developing a lasting relationship with a supplier. But, by being privately-owned, they usually enjoy a greater freedom in choosing the suppliers and are reasonably aligned towards the highest efficiency setting possible. Also, they understand our value proposition enough to be able to demand a chain of services during the whole duration of their specific job (for example, the construction of a dam). Although this is usually a returning customer, what distinguishes them from Tier 3 customers is that

each contract spans a longer time, covering different phases of their project. The contracts in this tier display reasonable margins and highly predictable revenues, being regarded within the company as a "superior" way to serve the customer.

Despite its attractiveness, this tier does not yield a strong revenue stream. The reason is that, although this kind relationship has the potential to return a high value to the customers, still very few figure that out by their own, mainly because of:

- Lack of procurement processes enabling long term relationships with suppliers;
- Lack of field knowledge/experience;
- Lack of trust in the suppliers' capacity of delivering the full potential value (fear of being locked in a bad deal);
- Lack of awareness of the suppliers' capacity of delivering value;
- Dependency on long-established practices;
- Lack of long-term vision or alignment, in the corporate level;

Although many of the reasons are structural and cultural, the company could be proactively educating potential Tier 2 customers amongst its customer-base (mainly Tier 3), which it is not doing currently. Most of the challenges listed above are related to an information gap, which suggests that there are untapped opportunities.

Business Dimensions	*Description*
Products	Mapping products (from photogrammetry), reports, engineering designs and field surveys
Services	Informal technical advice on specification and use of the data provided
Customer	Investors, Contractors, Engineering design companies
Channels	Direct sale
End Users	Program/project managers, designers, consultants and specialists
Complementors	None
Unique Competencies	• Breadth of offerings and cost-effective structure. • Widely recognized technical expertise and professionalism • Strong commercial orientation

Table 3 – Business dimension of Tier 2 – Total Solution seeker

Customer Dimensions	*Description*
Experiences	Readiness and flexibility to serve customer's needs
Value Delivery Systems	On demand team of sales professionals and technical resources.
Value appropriation	By the customer: • Dedicated technical capability • Fast reactions to unscheduled changes in scope, schedule or budget; • Qualified advice to support decision-making By the company: • Customer engagement; • Predictable revenue stream;

Table 4 – Value proposition for Tier 2 – Total Solution seeker

4.1.3. Negotiated solution seeker

This tier encompasses the majority of the private companies we serve. They are new or returning customers that, because of our expertise and reputation, rely on us to define the most efficient data set for their project and deliver it with quality and on time. They are likely to be good candidates for additional consultancy after the final deliverables, but that currently happens in a "ad hoc" manner, and is commonly not charged.

These clients portray a superficial understanding of our field of knowledge, and are likely to have a difficult time extracting value from the huge amount of data we usually generate. They are frequently demanding and fast decision makers. Once they find that our advice is oriented to their best interest (a golden rule for our commercial operation) and that we can deliver what they need, they become returning customers. We have been very successful in building a returning customer-base. Although that relationship is likely to last, sometimes evolving to personal friendship between counterparts, the frequency and amount of contract awarded is highly cyclical, and depends on externalities such as government priorities and economic situation. Very few companies invest on their own and, therefore control the contracting agenda.

These customers are also early adopters of new technologies, but rarely provide a strong enough revenue stream to drive the company's investment in new technologies. The investment agenda is influenced the most by government opportunities, which lag behind the forefront of innovations. The result is a lag between Tier 3 customer's demand and the company's technological status. This gap is being closed by recent and ongoing rounds of investment, but still exists.

Business Dimensions	*Description*
Products	Mapping products (from photogrammetry), reports, engineering designs, urban and environmental studies and field surveys
Services	Informal technical advice on specification and use of the data provided
Customer	Investors, Contractors, Engineering design companies
Channels	Direct sale
End Users	Program/project managers, designers, consultants and specialists
Complementors	None
Unique Competencies	• Breadth of offerings and cost-effective structure. • Widely recognized technical expertise and professionalism • Strong commercial orientation

Table 5 – Business dimension of Tier 3 – Negotiated Solution seeker

The main challenge in this tier is to move customers up (to Tier 2). Tier 3 customers aren't usually upgraded to Tier 2 because the company's involvement level doesn't change on each contract. The challenge remains in convincing these customers that an enhanced relationship is likely to deliver superior value. Given the long-term duration of these customer's projects, opportunities abound.

Customer Dimensions	*Description*
Experiences	Expert advice, turn-key delivery
Value Delivery Systems	Temporarily assigned team of sales professionals and technical resources
Value appropriation	By the customer: • Optimization of cost and high quality offerings in a crucial, foundation phase of the customer's job By the company: • Customer engagement (returning customer);

Table 6 – Value proposition for Tier 3 – Negotiated Solution seeker

4.1.4. Large price seeker

Customers in this tier are currently unserved by us, but bear enough business potential to raise the company's interest. New business development initiatives have also fell in this category in the past. The company carefully chooses which opportunities are worth pursuing, and generally engage in pure price negotiations, usually the customer's preferred procurement process. The main objective is to expand the business beyond the first contract, from a more privileged standpoint. The most successful initiatives yield a Tier 1-3 type relationship. Another goal is to build the company's resume with currently inexistent capabilities.

The company does not pursue a low-price strategy commonly. It, however, is prepared to wage price wars in selected opportunities, which add more value than the pure economic profit and don't jeopardize the company's commercial positioning.

Business Dimensions	*Description*
Products	Mapping products (from photogrammetry), reports, engineering designs, urban and environmental studies, field surveys
Services	Specific consultancy services
Customer	Government, and large private companies
Channels	Lowest price bidding
End Users	Program/project managers, designers, consultants and specialists
Complementors	None
Unique Competencies	• Breadth of offerings and cost-effective structure. • Widely recognized technical expertise and professionalism

Table 7 – Business dimension of Tier 4 – Large price seeker

Customer Dimensions	*Description*
Experiences	High quality service and support
Value Delivery Systems	Temporarily assigned team of sales professionals and technical resources
Value appropriation	By the customer: • Quality offering in a highly optimized cost structure By the company: • Potential conversion of the customer into more attractive tier; • Company's "resume" • Lowest cost sale

Table 8 – Value proposition for Tier 4 – Large price seeker

4.1.5. Small price seeker

The weakest bond with customers is observed in this tier. Their contracts are usually very small, and the company doesn't hold clear advantages against small offices and autonomous professionals. Very little bidding takes place and revenue stream is non-significant. The tier is regarded as important to "keep doors open" and build ties with the immediate community.

Business Dimensions	*Description*
Products	Field surveys and small publishing jobs
Services	None
Customer	"Walk-in" customers, small companies
Channels	Direct sale (responding to consultations)
End Users	Program/project managers, designers, consultants and specialists
Complementors	None
Unique Competencies	• Reputation, technical expertise and professionalism

Table 9 – Business dimension of Tier 5 – Small price seeker

Customer Dimensions	*Description*
Experiences	High quality service and support
Value Delivery Systems	Temporarily assigned team of sales professionals and technical resources
Value appropriation	By the customer: • Quality offering in a highly optimized cost structure By the company: • Connection with the surrounding community

Table 10 – Value proposition for Tier 5 – Small price seeker

4.2. SEGMENTATION ANALYSIS

The segmentation proposed in this section was cross-referenced with the company's customer base in order to provide a reality check and an opportunity to dig deeper in each tier's specific characteristics. A classification of the company's contracts in each tier was undertaken. The classification was narrowed to last year's customers, to reflect the most current situation and support more realistic analysis. Figure 3 shows the tier's positioning in relation to the Delta model Triangle and highlights their main characteristics. Figure 4 shows each Tier's participation in the revenues originated by the Mapping and Survey business.

Tier 1 dominates the revenue generation, which copes with its bonding capabilities. In addition, there is a reinforcing relationship in the way the company approaches this tier that can't be ignored. Because of the amount and frequency of the opportunities in the government (the main infrastructure investor in Brazil), it is regarded as a high potential client base. Each opportunity in this tier also demands more in terms of general commitment because of the requirements and regulations of the public institutions'

procurement process. Therefore, the company's sales operation is heavily oriented towards this tier. This explains not only the dominance of government-related revenues (64% in 2007) but also the relative weakness of Tier 2's and 3's pipelines, based on private companies.

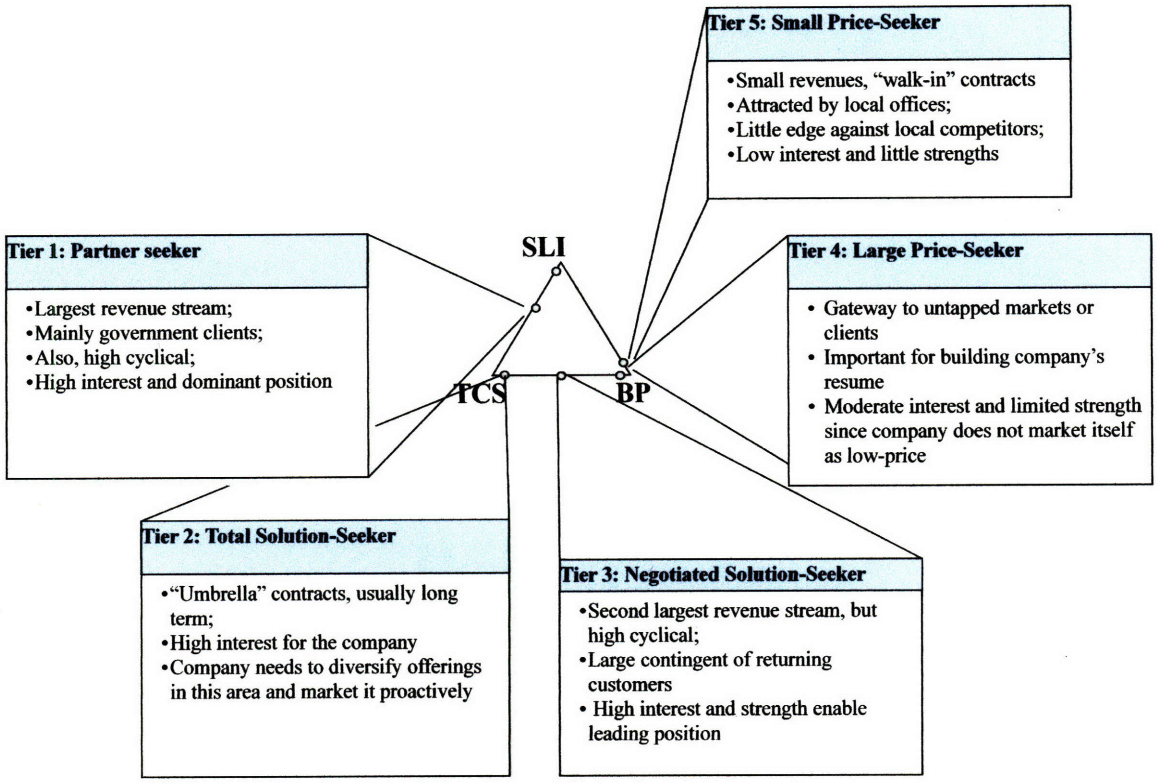

Figure 3 – Competitive position of each customer tier

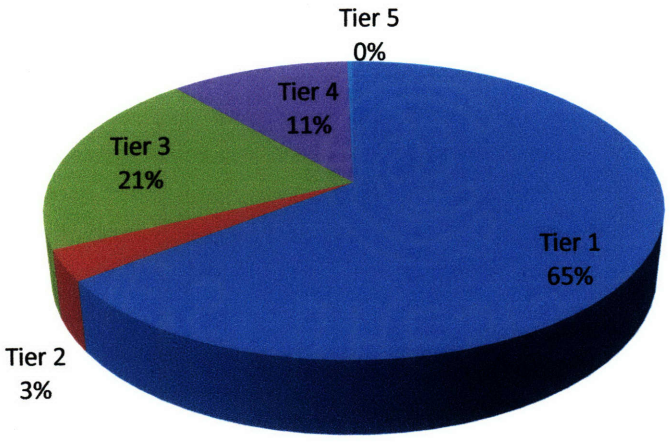

Figure 4 – Mapping and Survey revenues per customer tier

As it became clear by the segment's description, these two tiers hold an important business development potential, which can be tapped through a deep involvement in the client's "job". A measure of the business potential of Tiers 2 and 3 can be expressed by comparing differences current offerings and the customer's tasks (Table 11). Usually, the customer struggles with the complexity and volume of the data we provide while undertaking these tasks. An important cohort is so unprepared to tackle them that their job suffers from bad execution and falls short of the expectations. This could extend the company's involvement from a small period in the beginning to a strong participation (in different levels) in the project's entire lead time.

Client's job	*Average Duration (months)*		*Current Offering*	*Unserved Needs*
	Topocart's contract	Client's initiative		
Build power line, gas/oil ducts	< 3	24	A one-time delivery of large amounts of geographic data especially tailored to the client's area of interest and needs	• Basic handling (subsets, conversions, publishing) • Advanced handling (spatial analysis, designs, processes, workflow) • Basic maintenance (storage, versioning, backup); • Advanced maintenance (time series, oversight of related supply chain)
Build highway or railway	3-6	60		
Build dam	3-12	60		
Build water and sewage systems	< 3	24		
Manage mines, farms, land taxes collection	3-12	Not defined		

Table 11 – Business potential on Tiers 2 and 3 (source: company information)

Tier 4 benefits from both the company's alignment with government procurement processes and the effective cost structure, allowing for very low friction. In fact, the customer acquisition processes related to this Tier are the easiest to undertake, since no strong relationship is required and the bidding process displays a fraction of the regular bids' complexity. These are the main reasons for the financial strength of its position (surpassing Tier 3, for example, despite having lesser bonding potential).

Tier 5 shows residual revenues, result of the company's passive approach to it.

4.2.1. Attractiveness and Strengths Analysis

Each tier displays a different attractiveness to the company and is approached by a particular set of strengths. Tiers 1, 2 and 3 are highly attractive but the company is not equally strong in all of them. Tier 4 sits in an intermediate position and tier 5 is in the low-end of the Attractiveness vs. Strength matrix (Figure 5).

The company is well positioned to serve Tier 1 (Partner seeker), a highly attractive cohort. The main competitors are the largest Brazilian firms (Esteio and Engefoto) which possess strong pre-bid consulting capabilities and share a similar general orientation towards serving this customer base.

Tier 2 (Total Solution Seeker) is a highly attractive market, but the company's rather passive approach has resulted a weak positioning. We suffer competition both from the large, structured firms and from smaller, aggressive players (like Aeroimagem, Maplan and Digimapas) and since no differentiation is perceived besides the company's reputation, rivalry is fierce and, not rarely, price-centered.

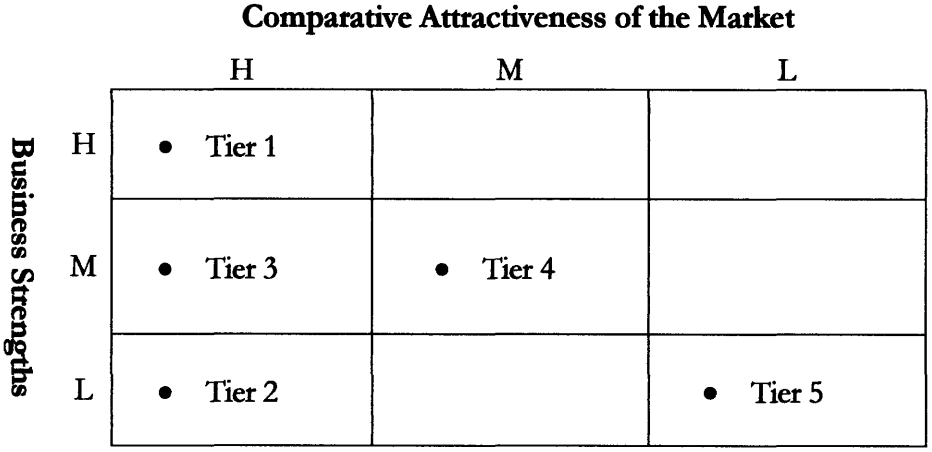

Figure 5 – Comparative Attractiveness versus Business Strengths

Tier 3 (Negotiated Solution Seeker) displays a stronger position than Tier 2 and is as attractive. This is because the customer's regular procurement process already supports the type of contracts usually awarded in this tier, which is not always the case in Tier 2. The company has a significant returning customer base in Tier 3, result of its reasonable business strengths (reputation, excellence and cost-effectiveness). Still, a more active approach is likely to differentiate the company against its current competitors and increase the chances of moving customers to Tier 2.

Tier 4 (Large Price Seeker) in an intermediary position in both dimensions, because it is regarded as a gateway to new accounts. Being a temporary position, it has been regarded a secondary priority in terms of building competencies and market power.

Tier 5 (Small Price Seeker) has no justification to be kept except for its role of integrating the local office with the surrounding community.

4.2.2. A closer look at attractiveness

As discussed earlier in the section, Tiers 2 and 3 are populated with a customer base with important unserved needs. It is crucial to understand the subtleties that differentiate these needs. From the company's past experiences, four dimensions were identified:

- Job Duration: Since the data provided by the company is commonly the foundation for the customer's job and supports its full development from beginning to end, the total job's duration is a good measure of the untapped business potential. Table 11 demonstrates that gap for common jobs.

- Job Complexity: The importance and depth of the geographic domain within the customer's job and the tasks' complexity determine the solution's level of sophistication and drives value addition and rent appropriation.

- Resources Alignment: The customer's level of technological maturity plays an important role in each opportunity's attractiveness. The more IT-oriented is the organizational culture the larger the breadth of offerings possible.

- Capacity Gap: The distance between the customer's and the company's resources, including knowledge, experience, people, systems, is a factor that directly influences attractiveness.

To better illustrate these dimensions, two cases are explored below.

	Customer 1	*Customer 2*
Customer's final job	Dam construction	Railroad construction
Job Duration	Aprox. 5 years	3-5 years
Job Complexity	High	Medium
Resources Alignment	High	Low
Capacity Gap	Small	Large

Table 12 – Two Cases of Differing Customer Attractiveness

To enable comparison, both customers belong to Tier 2 (Negotiated Solution Seeker). The customers' final jobs are both related to infrastructure (construction of a dam – Customer 1 - and a railroad – Customer 2) and the company provided them with a complete set of cartographic data, aimed at the planning and management of the job. Both include changing the occupation of large areas, impacting

the environment and inhabitants and involve legal and social issues. The jobs' complexities are similar, although the dam construction holds primacy and it is also likely to last longer than the railroad's in this particular case (this is related to the size and location of the enterprises, not necessarily to its nature). In terms of Resources Alignment, Customer 1 doesn't possess sophisticated IT resources and trained personnel. It is also very unlikely that those resources will be acquired during the project, due to cultural, organizational and structural factors. Customer 2 is much more IT-oriented and has capable people, enabling the application of advanced solutions and an extended value addition. Finally, Customer 1 has less in-house cartographic capacity than Customer 2. This is driven mainly by the lack of specific knowledge and experience but is also influenced by the customer's IT orientation. Figure 6 makes it clear that although Customer 1's job (the dam) is more attractive in duration, complexity and capacity gap, the lack of resource alignment is likely to hinder the company's efforts to deliver a comprehensive value proposition. This is not the case of Customer 2 (the railroad builder) where integration is easier and the other dimensions contribute to a higher attractiveness. Therefore, despite the apparent superiority of Customer 1's job, the company might extract more value from Customer 2's as Figure 6 makes clear.

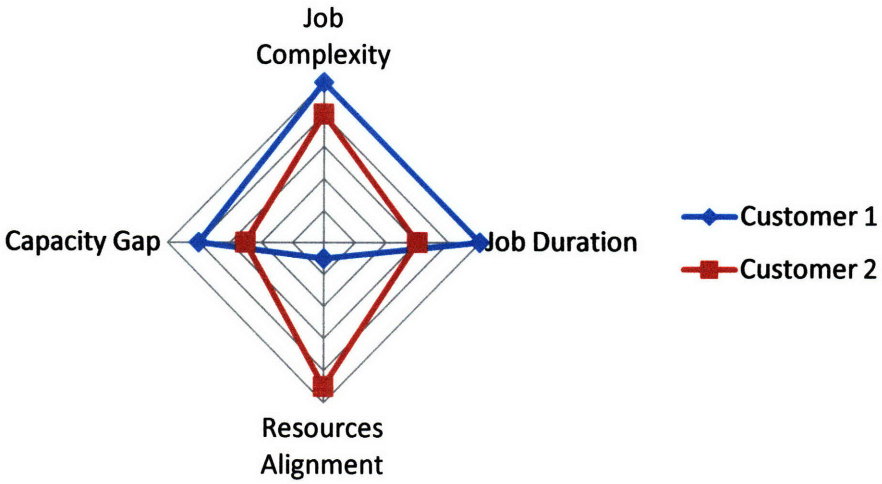

Figure 6 – Mapping of differing customer attractiveness

Similar approach can be used in Tier 1. However, customers in this tier display a smaller range for each dimension therefore the analysis is confined to certain limits as shown in Figure 7.

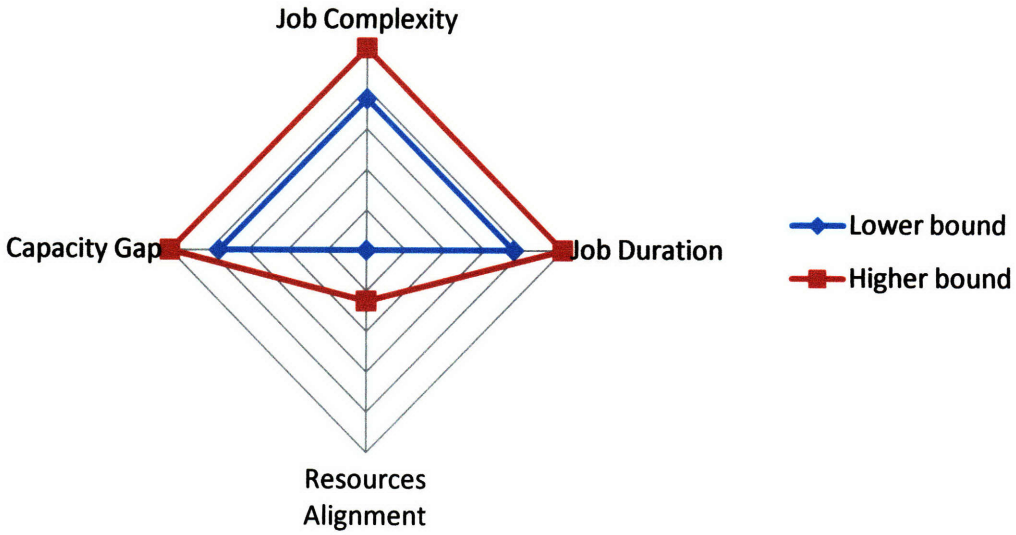

Figure 7 – Customer Attractiveness (Tier 1)

Government customers deal with long-term, complex initiatives and portray large capacity gaps. But, just as the Customer 2 example above, the lack of alignment makes it very hard to deliver improved value propositions. The challenges customers in Tier 1 face were described in 4.1.1.

The opportunities in Tier 4 are usually not prone to a unified analysis and depend on a very particular set of circumstances therefore demanding a case-by-case decision making process.

4.3. BUNDLE OF COMPETENCIES

Along the years Topocart has built a set of abilities that are the basis for its current success. Although the majority of those aimed to improve operational effectiveness, they constitute an important base for the development of a customer-centric strategy. The existing set of competencies is discussed below:

- Best Product:
    - Low cost: The company's operation is dependent on resources that either display high substitution costs (such as the need for skilled technical people, trained for six months before becoming productive) or are subject to an unpredictable work schedule (such as the aircrafts and the high-value sensors they carry, which can only operate under perfect weather, in order to assure high quality outputs) making it very difficult to cope with the widely variable demand and to keep cost under control. To tackle that, the company has built a low-cost supply network based in Asia and Latin America and achieved a superior cost and productivity position in the in-house production phases.

In addition, the company has invested in acquiring technologies that enable higher productivity, reducing the operational risk imposed by the weather. Although the company has no policy in place regarding a low cost market approach, it is able to use its cost advantage in selected opportunities, such as the ones particular to Tier 4 or in accessing new markets;

- Differentiation: With its methods and theories going back to more than a hundred years, cartography production companies try to differentiate themselves by area of expertise, use of the latest technology and reputation. In terms of expertise, the company, instead of focusing on a particular field, has worked with the widest range of applications possible. From plantation management to land taxes collection and environmental applications, the company's knowledge and experience have been successfully applied. Infrastructure works are currently a major source of revenue due to the developmental boom the country is going through and constitute a field where the company is widely recognized. In terms of technology use, Topocart ranked second in new technology acquisitions in the Brazilian market in 2007. Mapping companies all around the world buy technology from suppliers in the market, rather than developing its own, with rare exceptions. Although they are advanced users of this technology, they usually find that the research, development and production of new mapping technology (sensors, measurement equipment, processing software) are better managed by the long-standing, reputable suppliers available. The economics are not encouraging either, since the elevated R&D costs can't be redeemed unless a large scale deployment is put in place, leaving the "retailing" to other similar companies

(and their competitors) as the only feasible business model. Smaller scale development (methodology, technology adaptation) is carried out by most of the companies, usually under the demand for a particular job, later been rolled out to the regular operation, if feasible. Since these two differentiation factors (area of expertise and use of technology) are reasonably available to any competitor to replicate, the company's reputation plays an important role. In its territory, Topocart has been synonymous of trustworthiness and technical excellence. Evidence of this is the fact that the company has been a frequent source of advice to policy makers and has also been called to offer expert advice on disputes on involving competitors' jobs.

- Total Customer Solutions:

    - Horizontal Breadth: Topocart has the capacity of offering a large array of different services to clients. We have the technology and knowledge to deliver precise cartographic information, be it the measurement of a small room or the production of a countrywide map. The company also possesses consulting competencies in engineering design, urban planning and environmental studies, which covers the majority of the client's fields of operation. The principal edge enabled by these capacities is a better understanding of the client's final job and the offering of bundled services;

    - Customer Integration: the company delivers a strong effort when designing the services' deliverables to make sure they not only fully serve the client's needs but also

integrate with the clients' operation. This involves setting the right standards and structure for the data in the needs assessment phase.

- Redefining the customer experience: Currently, the company provides expert knowledge, usually in the form of information analysis reports or informal advice. The relationship is contained to the period the client's contract in is execution;

- System Lock-In:

  - Exclusive Channel: Topocart is the main provider in its territory. Since the nature of the business is also geographic (expensive production resources must be deployed to each project's area of interest) the further a job location is from a competitor base, the least competitive it is. Topocart has been successful in locking in important customers in its territory. The company also provides pre-sale assistance to potential clients fostering a continued relationship since they turn to Topocart for advice regarding best practices and configurations because they usually lack expertise in the area;

The existing bundle of competencies is summarized in Figure 8.

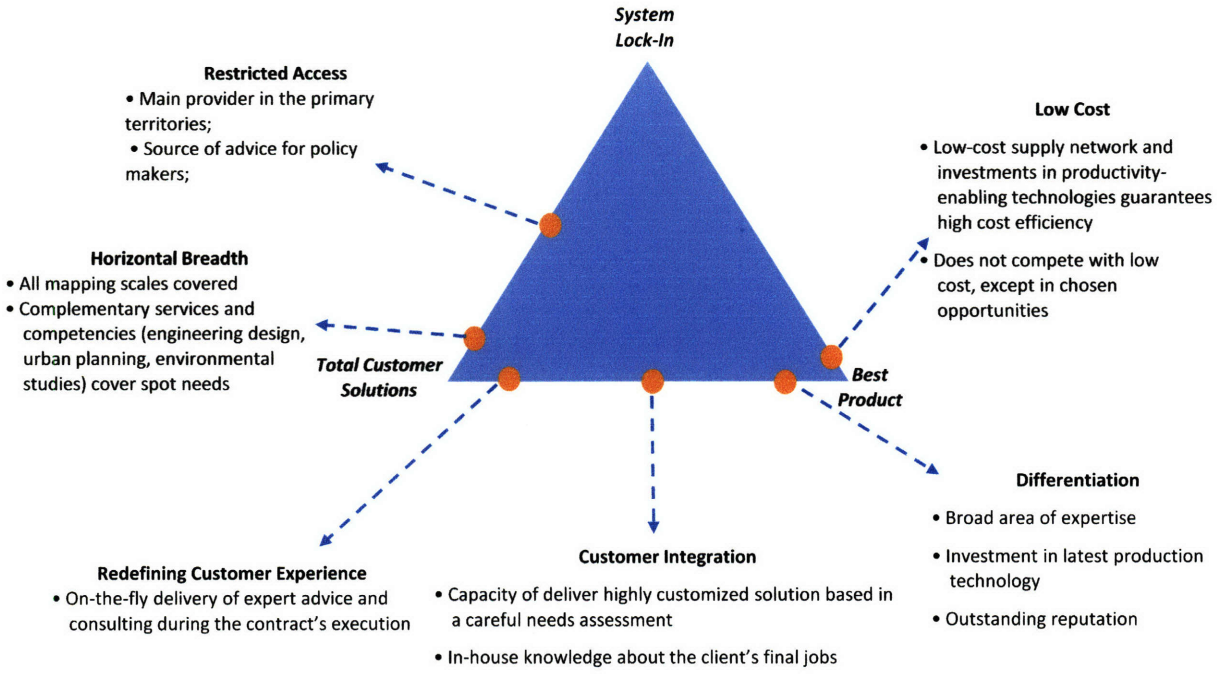

Figure 8 - Topocart's existing bundle of competencies

The desired bundle of competencies is discussed below

- Best Product:
    - Low cost: the company must aim to acquire a superior level of operational effectiveness to the extent to support expansion to highly competitive markets, currently untapped, without compromising margins. This must be achieved by improving the supply chain's coordination, efficiency and alignment to the company's strategy and culture and by the setting of objective, world-class performance goals throughout the production network;

- Differentiation: the company must continue to pursue a differentiated position from its competitors through the introduction of cutting-edge technology and extended technical competencies in order to add more value to the offerings and capture a larger share of the customer's wallet. A geographic expansion is also a desirable path, since most of the competitors operate with a strong local focus and, therefore, are not perceived as a one-stop-shop for customers operating countrywide.

- Total Customer Solutions:

  - Horizontal Breadth: the company's offerings must be expanded to include the latest technologies regarding sensors (digital cameras, LiDAR) and applications (GIS, web-based distribution, data management). A stronger integration with other existing technical competencies such as urban planning, engineering design and environmental studies is also desired and might add new services to the mapping track.

  - Customer Integration: a larger breadth of offerings and technical competencies will support the company's positioning as a complete solution provider. As presented in Table 11, several tasks associated with the company's services are currently under the client's responsibility, with important diseconomies and misalignments:

    - Basic handling (subsets, conversions, publishing)
    - Advanced handling (spatial analysis, designs, processes, workflow)
    - Basic maintenance (storage, versioning, backup);
    - Advanced maintenance (time series, oversight of related supply chain)

The company must acquire the technical and managerial competencies to capture these tasks from the client's hands, offering savings in total ownership/usage costs and guaranteeing excellence.

- Redefining the customer experience: the company must apply its technical and managerial competencies to integrate the outsourcing tasks listed above to the client's final job, therefore extending the relationship with its clients, both in duration and depth. This will require a change in the way the accounts are managed, to enable long-term relationships, one of an in-house supplier.

- System Lock-In:

  - Exclusive Channel: the current relationship model must be maintained and carefully scaled to include a broader geographic area of influence and more potential clients. This must be done by hiring well-connected, seasoned professionals to expand the networking activities. The back-office functions must be accordingly furnished;

  - Dominant Exchange: a position of this kind might emerge from the successful implementation of the Total Customer Solution strategies (as explained above). However, given the highly customized nature of the offerings and client's needs, it is not expected to encompass a massive portion of the customer base;

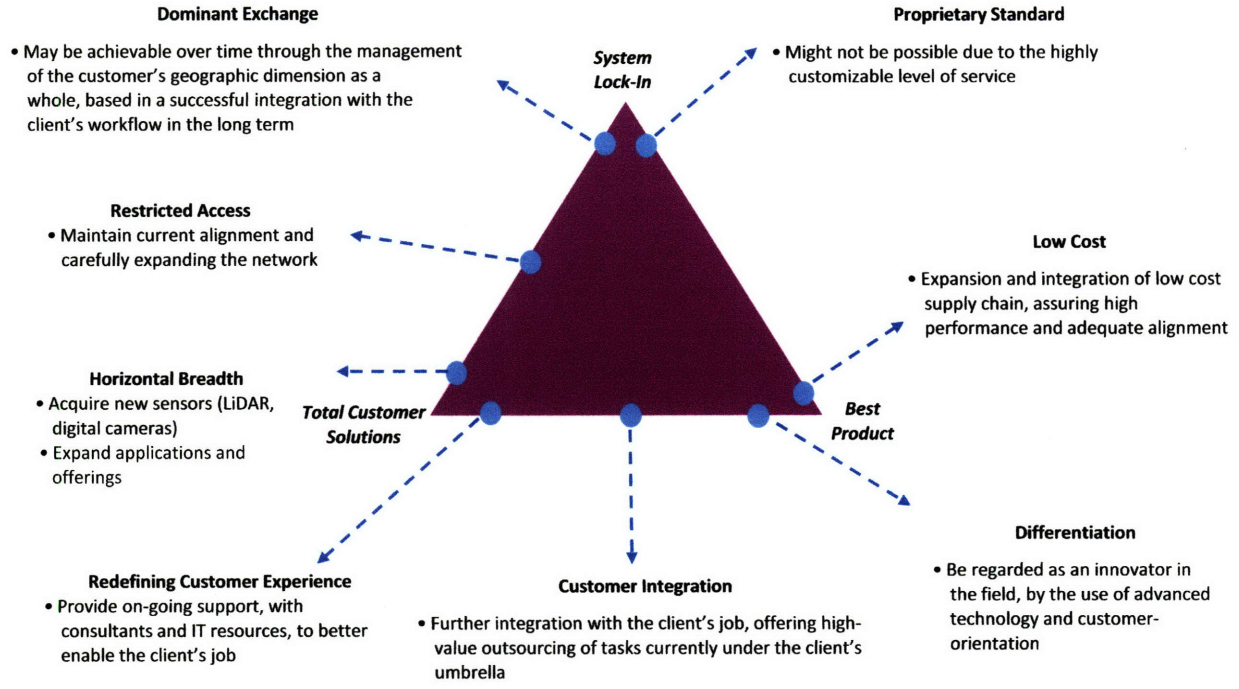

Figure 9 - Topocart's desired bundle of competencies

4.4. MISSION OF THE BUSINESS

Under the Delta Model, a company's mission is an objective assessment of the business' current and future focus, guided by the discussions in the previous sections, which set the guidelines for a superior customer bonding. This comparison is done in eight "scopes":

- Product Scope:
- Service Scope:
- Customer Scope:
- End User Scope:

- Channel Scope:
- Complementors Scope:
- Geographic Scope:
- Unique Competencies:

Ratings will be provided for each scope and its components following the norm presented in Table 13.

Scope	*Priority*	*The Product, Consumer, Channel or Geographical Location...*
Existing	--	... is being divested or exited from
	-	...will be assigned to a low level of importance
	E	...will continue to receive the current level of resources
	+	...is assigned a high level of importance and additional resources to achieve a better competitive position
	++	...is assigned the highest level of importance and the resources needed to achieve as outstanding a competitive position as possible
New	--	...is very tentatively considered for business activity
	-	...is tentatively considered for business activity
	E	...will receive the necessary level of resources
	+	...will be assigned a high a level of importance and the necessary resources to achieve a strong competitive position
	++	... is assigned the highest level of importance and the resources needed to achieve as outstanding a competitive position as possible

Table 13 – Priority Assessment Scale for the Business Scopes

4.4.1. Product Scope

Being primarily a services company, Topocart doesn't market products. Although there seems to be room for the commercialization of off-the-shelf components, the company's perception is that these must be positioned as enhancing a customized service offering, instead of being sold separately.

Although there is no product commercialization currently, a future Product Scope is desirable, bundled with and supporting the enhanced set of services the company will develop. They can be put together in families, broadly described as follows:

- Data Experience: These systems will focus on enhancing the processes supported by our datasets within the client, by providing, for example, powerful 3D visualization, navigation, query, simulation and conversion capabilities tailored to the client's needs. Existing solutions are accessible only to a highly specialized community (such as production departments within mapping companies) and must be customized to the non-technical end-user.
- Data Management: usually delivered in large chunks (amounting to several Terabytes), the datasets provided by the company pose several challenges to the clients, who usually lack resources for its management and manipulation. The deployment of advanced database management, data processing and connectivity solutions tailored to the specifics of the geographic information is likely to add value to the company's current offerings and support the customer-bonding strategy.

New Product Scope	--	-	*E*	+	++
"Data Experience" products			X		
"Data Management" products				X	

Table 14 – Priorities of the New Product Scope

The challenges associated with the development of a new product scope are described in Table 15.

Task	*Challenge*
Select strategic partners	Engage existing players in partnerships able to provide highly customized systems while maintaining the solutions' "ownership" and market power within Topocart.
Set in-house infrastructure	Acquisition of stellar technology and human resources for the implementation and support of the in-house infrastructure
Integrate with the current business model	Although Topocart must position itself as a channel for the new products, it must not deviate from its longstanding business model, i. e., customized service offerings with high value added.

Table 15 – Challenges from the implementation of a Product Scope

4.4.2. Service Scope

Because the customer's needs and requirements vary hugely from job to job, the company's business model is shaped to offer tailored solutions, packaged as services, which support premium pricing. The relatively small number of contracts, especially in Tier 1 - the most profitable and expressive (see Table 16) also suits this approach.

Tier	*% of 2007 Revenue*	*Number of contracts*
Tier 1	69.2%	33
Tier 2	2.8%	3
Tier 3	18.5%	55
Tier 4	9.3%	7
Tier 5	0.3%	19

Table 16 – Number of Contracts and Revenue Percentage per Tier, 2007 (source: company information)

The Existing Service Scope encompasses the customized offerings supported by the breadth of technical competencies within the company in the field of Mapping and Survey. To serve the customers, the company deploys high-end technology to the client's area of interest and performs the sensoring according to the specifications. A dedicated team analyses the raw data and process it to deliver the information as required by the client. Usually, the company's involvement ends when the definitive data sets and reports are delivered to the client. These activities are central to the company's operation and respond for the vast majority of revenues.

Existing Service Scope	–	-	*E*	+	++
Mapping and Survey					X
Technical Consulting			X		

Table 17 – Priorities of the Existing Service Scope

In an extended scope, the company must be able to provide support for the further use and manipulation of the data provided, increasing customer bonding and supporting stronger positions in the triangle. Similarly to the Product Scope discussion, the new services can be arranged in two categories:

- Data Experience: Technical activities (outsourcing) such as subset extraction, data conversion, publishing, spatial analysis, designs, processes, workflow and oversight of related supply chain. The company must specialize in modeling "workbenchs" (including state-of-the-art methodology, software, hardware and technical people) to address clients' post-data delivery demands with outstanding standards and lower costs than possible within their organizations.
- Data Management: Supported by a robust infrastructure solution, the company will offer services such as storage, versioning, backup and time-dynamic data management.

New Service Scope	--	-	*E*	+	++
Mapping and Survey					X
Technical Consulting			X		
"Data Experience" services				X	
"Data Management" services				X	

Table 18 – Priorities of the New Service Scope

The challenges associated with the changes in the service scope are described in Table 19.

Task	*Challenge*
Implement the "Workbench" approach	Creation of a knowledge base, and a collection of resources (people, software and hardware) to function as building blocks for a quick and precise response to the client's demands, maximizing output and reaping economies of scale. A Workbench with the appropriated type and amount of resources must be put together by the "Client Handler" as soon as the order comes in, being "disassembled" and the resources reassigned right after the completion of the task.
Implement enhanced Needs Assessment phase	During pre-sale, a structured Needs Assessment process must be implemented, with interviews to measure in detail the four attractiveness dimensions detailed in 4.2.2 (Job Duration, Job Complexity, Resources Alignment, Capacity Gap) and determine opportunities to offer Workbench services. During the execution, when new situations arise, the opportunity assessment must continue.
Select and train personnel	Two major functions are required: the Client Handler, responsible for centralizing the demands and keeping track of the relationship with the client and the technical crew, who "populate" the "Workbench" providing knowledge and working force.
Assure creative and state-of-the-art solutions	Tracking of the latest developments in methods and software and fostering an environment of innovation within the Workbench. A connection with research institutes over the world, with members

	interested in joining Workbenches remotely is desirable.
Develop an adequate pricing and billing system	A much more efficient, transparent pricing and billing system must be developed to support the Workbenches.

Table 19 – Challenges from the change in the Service Scope

4.4.3. Customer Scope

The company currently has two approaches to the client base, depending on whether they are government institutions or private companies. Although offerings are basically the same, the pre-sale procedures vary immensely between these two segments. Therefore, it is accurate to say that this segmentation was based in a functional rationale, rather than a market-oriented analysis.

Existing Customer Scope	--	-	*E*	+	++
Government					X
Private				X	

Table 20 – Priorities of the Existing Customer Scope

As discussed in section 4.1, a new segmentation is necessary to support the company's efforts to consolidate a dominant position in its home market. The priorities are assigned below. Tier 1 will continue to lead the resource allocation, because of its dominance both in terms of total revenue and contract's volume. Tier 2 and 3 were deemed to bear important untapped potential accordingly being defined as target of increased resources. Tiers 4 and 5 will continue to be addressed as usual, strategy that copes with the tiers' potential and importance for the overall positioning of the company.

New Customer Scope	--	-	*E*	+	++
Tier 1					X
Tier 2				X	
Tier 3				X	
Tier 4			X		
Tier 5			X		

Table 21 – Priorities of the New Customer Scope

The challenges associated with the changes in the customer scope are described in Table 22.

Task	*Challenge*
Segment sales resources accordingly	The sales and marketing department must define specific procedures to serve each Tier. Processes and BI in the pre-sale and post-sale phases must be "segmented" with the use of a customizable CRM solution to allow a resource allocation that is fully aligned with the company's strategy.
Educate operation's officers in the new offering strategy	The segmentation must percolate to the operation, guiding the approach to each client.
Selection and Training of personnel	The new segmentation must be well known by the employees, who must be trained in the characteristics of their jobs that are impacted by it.

Table 22 – Challenges from the change in the Customer Scope

4.4.4. End user Scope

Currently, the company assesses the end-user needs indirectly during pre-sale. Since this phase is usually carried on with a procurement officer, there is a misalignment between what is specified and what's ideal for the end-user. The company considers the adherence to the specifications as the main indicator of success in a project. There is very little engagement after the final product delivery. Therefore, the procurement or receiving officer is commonly the "end-user", in the company's perspective.

Existing End-user Scope	–	-	*E*	+	++
Procurement officer			X		

Table 23 – Priorities of the Existing End-user Scope

In the new scope, three layers of end-users must be identified and contacted in each contract. These end-users hold needs and expectations that might constitute opportunities suitable to be served by the new service and product scopes (see 4.4.1 and 4.4.2). The technical end-user (for example, the infrastructure design engineer) must be the primary focus, since making his job easier is the shortest path to adding value to the client. But, his manager might be interested in outsourcing complex or labor-intensive tasks and the policy-maker might take advantage of the company's supply-chain management capacities.

New End-user Scope	--	-	*E*	+	++
Receiving officer			X		
Technical end-user					X
Managerial end-user				X	
Policy making end-user				X	

Table 24 – Priorities of the New End-user Scope

The challenges associated with the changes in the end-user scope are contained in the previous sections.

4.4.5. Channel Scope

Currently the company relies in its network of contacts to market its services. Each person in the sales front is charged with maintaining a set of "relationships" with purchasing officers and decision-makers. Direct sales through these networks is the only channel to the market.

Existing Channel Scope	--	-	*E*	+	++
Direct sales					X

Table 25 – Priorities of the Existing Customer Scope

A new channel scope must encompass the revenue stream generated by an expanded relationship with the client. The "Client Handler", although also selling directly, has the mission to keep a specific client locked-in by serving his needs as they appear, acting as an account manager.

New Channel Scope	–	-	*E*	+	++
Direct sales					X
Client Handler				X	

Table 26 – Priorities of the Existing Customer Scope

The challenges associated with the changes in the channel scope are contained in the previous sections.

4.4.6. Complementors Scope

The company does not enjoy a complementors' network. There are two main reasons for that:

- Geographic data providers, like Topocart, excel by operating with the broadest range of standards possible, which are much more commonly set by software and equipment suppliers (which provide the tools) and less by clients and the providers themselves. Therefore, in a certain sense, the data providers are complementors to the software and equipment suppliers, which leaves little room for them to consolidate such a network of their own.
- The largest data providers in the world sometimes develop their own standards within the scope of a "branded" offering. For example, Pictometry, a U.S. based company, bundled a well-known but underutilized type of aerial photography with innovative software and branded it "Pictometry", delivering its own standard. In that case, a complementor "drive" was created within clients and suppliers to integrate to the new standard and reap the benefits of the offering. To enjoy that, Topocart would have to achieve a position of similar importance.

4.4.7. Geographic Scope

Topocart is based in Brazil's capital, Brasilia, and operates in the whole country, maintaining a strong position in the Midwest region. The company also possesses an increasingly dominant position in the Northeast and North regions (for a map of Brazil's regions, see Figure 10). These regions are the least developed in the country and, therefore, have the most need for infrastructure construction, one of the most important business drives for the company.

The company recently entered the Southeast region, the richest in the country and rather underserved by mapping companies. The South, also very developed, remains out of the company's priorities due to concentration of mapping companies, including the two major competitors, which, enjoying local advantages make it unattractive for a new entrant.

Figure 10 – Brazil's regions

Outside the country, Topocart operates in Angola (Africa), a Portuguese-speaking nation which had its infrastructure destroyed by a long civil war (1975-2002) and enjoys large reserves of oil and diamonds. Although still not well organized, the country is viewed as having a huge business potential for Topocart.

As listed in Table 27, currently, the highest priority is assigned to the headquarters location (the Midwest region of Brazil) and Angola. Other Brazilian regions are perceived as in need of further investment to secure a dominant position.

Existing Geographic Scope	--	-	*E*	+	++
Brazil – Midwest					X
Brazil – North and Northeast				X	
Brazil – Southeast				X	
Angola					X

Table 27 – Priorities of the Existing Geographic Scope

In the envisioned Geographic Scope, the current priorities would remain the same and new locations would start to be tapped. The company sees potential for expansion to Latin America, United States and Canada, other countries in Africa and the Middle East. A more detailed discussion of the New Geographic Scope (including the many challenges involved) is presented in Chapter 5.

New Geographic Scope	--	-	*E*	+	++
Brazil – Midwest					X
Brazil – North, Northeast and Southeast				X	
South and Central America		X			
United States and Canada			X		
Angola					X
Africa and Middle East		X			
Europe		X			

Table 28 – Priorities of the New Geographic Scope

4.4.8. Unique Competencies

The company counts among its current competencies the focus on presale activities, in which it provides support for the client's decision process, as described previously. This approach creates a strong network with clients allowing for swift communication channels, which help anticipate needs and outperform competitors. The company is very aggressive in keeping and expanding this network (specially the one in the government), as well as protecting it from the competition. In its primary area, Topocart has been extremely successful in these tasks.

Lately, Topocart has developed a broad global supply chain involving outsourcing providers in China and India and equipment suppliers in Europe and North America. Although probably accessible to its competitors sometime in the future, this global reach has given Topocart a privileged position in cost control, production scalability (very hard to achieve in a country lacking qualified man-of-work like Brazil) and keeping its resources state-of-the-art. Currently, the development of the global network does not receive the same investment as the presale and networking drives.

Existing Unique Competencies	--	-	*E*	+	++
Presale activities					X
Government networking					X
Global supply chain				X	

Table 29 – Priorities of the Existing Unique Competencies

In the future scope, two other competencies will be added: the "Workbench", i.e. the alignment of the company's competencies to the client's needs in order to create a sustainable, long-term relationship and the Innovation Drive, the initiatives towards creating an environment that foster continuous innovation at Topocart. While the "Workbench" was previously discussed, the Innovation Drive will be presented later.

Table 30 shows the priorities for the new scope.

New Unique Competencies	--	-	*E*	+	++
Presale activities					X
Government networking					X
Global supply chain					X
The "Workbench"					X
Innovation Drive				X	

Table 30 – Priorities of the New Unique Competencies

5. Global Strategy

The present section will explore the particularities of a global expansion strategy for Topocart, based on four analyses:

- Industry Outlook: the assessment of the level of globalization in the industry as supporting argument for the expansion plan itself;

- The Home Base: the evaluation of the advantages and shortcomings associated with the current home location;

- The Target Locations: a discussion of the accessibility of the available locations to center the the company's expansion and the approaches best suited to each;

- Exporting the Bundle of Competencies: a discussion and which competencies must be exported (and where).

5.1. INDUSTRY OUTLOOK

The level of globalization of the industry and the assessment of whether going global is a reasonable move under the constraints and specificities of industry are a mandatory starting point for the setting of a global strategy.

Currently, several mapping companies operate worldwide with different degrees of globalization. Amongst them are:

- Hansa Luftbild: Founded in Germany in the 1920's, the company became the first major global player, due to the German's heavy investment in the industry (much of the early technology was developed there). Still today, the country has the most respected research institutes. Hansa was dismantled by the Allies in the end of World War II but following a reconstruction effort it grew to become a strong global operator once again. The company's strength relies not on an innovative market approach but in its sound reputation and professionalism. Today, Hansa holds permanent offices in Germany, Russia, Netherlands, Italy, Morocco, Saudi Arabia, India and China.

- Pictometry: A US-based company, founded in 1993, it developed an innovative approach to aerial photography by creating realistic 3D models of cities (examples can be viewed on Microsoft's Virtual Earth, a major Pictometry client). Pictometry focuses in partnering with companies around the world to provide the basic imagery for their products.

- Blom: Based in Norway, where it began its activities in 1954, Blom started a series of acquisitions to establish itself as global player in 2003. Today, they are located in Norway, Denmark, Germany, Italy, Spain, UK, Finland, Sweden, Indonesia and Romania. Blom differentiates itself by its reputation and by being the sole licensed Pictometry provider in Europe.

- Pasco: Created in 1953, in Japan, it is the major Japanese provider of geographic information and started its global expansion in 2003 with a joint-venture with a Chinese company. Notwithstanding its focus in Asia, Pasco has also been present in every continent (its first international project took place in Saudi Arabia, in 1963) and keeps permanent positions in

Japan, China, Philipinnes, Thailand, Indonesia, India and Finland. Pasco's competitive advantages lie with its extensive set of capabilities (the world's largest) and aggressive sales strategy.

The cases presented above and market research provide subsidies for the four-pronged approach proposed by Yip (Yip, 1995). Its dimensions are explored below.

5.1.1. Market similarities

Due to the high maturity of the techniques and applications of the industry's outputs, market similarities abound. European countries (notably Germany, Austria, Switzerland and Holland) first started exporting the technology, supported by their equipment suppliers and research centers. This contributed to a relatively small set of industry standards till today. Also, due to the high-value, technical nature of the service, sales activities are always based on direct sales, irrespective of the location. The major variations between different geographies are the applications. Developing countries, which need infrastructure, usually contract mapping for building highways, railroads, oil ducts and urban expansion. Developed countries, where much of the basic investment in infrastructure has already been done, map for planning or monitoring purposes. Although determinant for the nature and amount of technical resources to be dedicated, these variations are addressable with virtually the same set of competencies, therefore making a company's adaptation to a specific set of requirements a much simpler task than in other industries, such as consumer goods, for example.

5.1.2. Scale and scope economies

The supply-chain of the aerial mapping business involves two distinct phases: the data production and the processing of the data collected. The first demands the deployment of an expensive production resource to every job's location (usually a special airplane equipped with high-precision sensors). The second takes the first phase's output and performs a series of transformations and analyses in order to deliver information that makes sense to the final client. Although the data production phase involves high-valued resources and a high operational risk, the bulk of the operation is done afterwards, with the employment of tens (or even hundreds) of skilled technicians and special computing resources. This phase can be concentrated in one or several locations, and Topocart's case is not different, with its processing done in India and China, mainly. Also, because a fixed set of competencies is enough to serve different demands, the broader the scope of application, the more the company will appropriate rent. Therefore, both economies of scale and scope exist. In order to minimize the high fixed cost of the sensor deployment, partnerships with local companies can be established.

5.1.3. Comparative/Competitive advantages of locations

Several locations are important in the industry for they provide advantages to the companies they host or are connected to. The main are:

- West Europe: the birthplace of the technology, still hosts the majority of the equipment suppliers and the research institutes. Companies connected to this network of innovation secure a privileged position in the industry by either acquiring technology developed there and by gaining access to the highly skilled professionals;

- United States: an advanced market, where demand is complex and requires providers to make use of the best techniques, people and equipment, fostering constant innovation. Commonly, the US market sets the pace for developments in Europe.
- Asia: Cheap labor and skilled man-of-work constitute the main advantage of the Asian locations. Although important to maintain competitiveness, it is of reduced comparative benefit since more and more companies are transferring production jobs to these places;
- Developing countries: companies located in developing countries experiencing strong growth cycles such as Brazil, Argentina, Venezuela, Panama, Angola, Botswana, among others have access to a booming demand that, although unstable and subject to economic, political and social complexities, provide enough self financing capacity to explore other locations;

The question of which locations to attack will be more thoroughly discussed in 5.3.

5.1.4. Regulation

Country regulations represent the most important barriers to global expansion. The mapping business is regarded as a national security activity and companies have their aerial operations strictly monitored by the government. In some countries, only national companies can operate. But since the restrictions apply mainly to the aerial phase, they could be circumvented by local partnerships, which is a common practice in the industry. In addition, this phase, though crucial, is not the highest value-added activity as previously discussed.

The discussion is summarized in Figure 11, which shows the Yip's radar for the mapping industry.

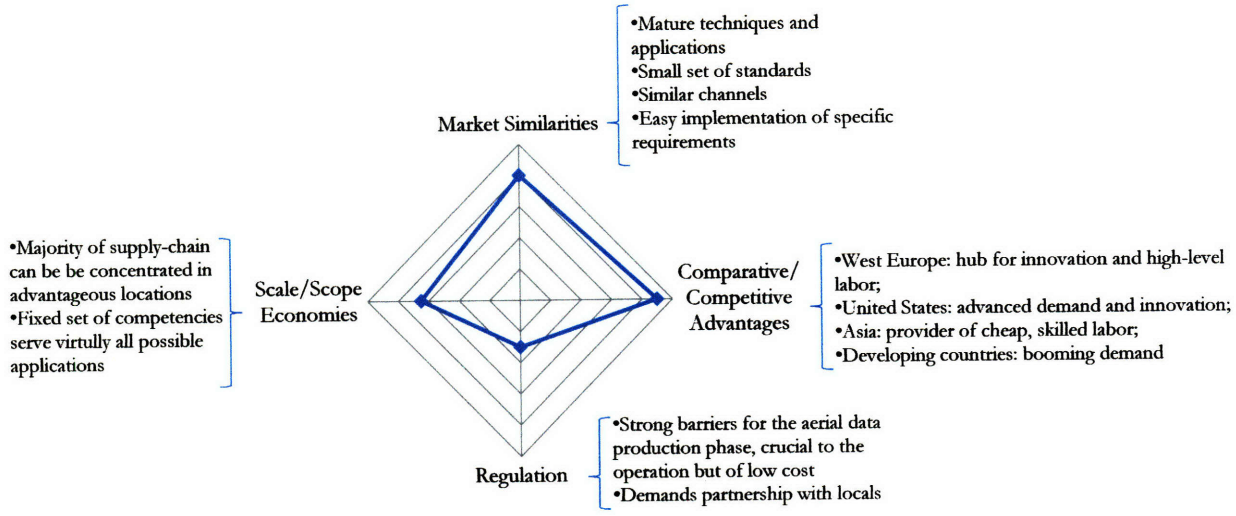

Figure 11 – Level of globalization for the mapping industry (Yip, 1995)

5.1.5. Conclusions

The level of globalization in the mapping industry is reasonable, with several success cases worldwide. This is explained by Yip's radar which shows important globalization drives in three of the four dimensions. The analysis identified that the current global setting of the industry supports economies of scale and scope and offers opportunities to exploit location-based comparative and competitive advantages. Also it was made clear that there are important similarities between dispersed markets. Government regulation imposes barriers, which can be overcame with the localization of the regulated portion of the business (the aerial phase) by either incorporation or partnership with local companies. These conclusions support the global expansion aspired by Topocart.

5.2. THE HOME BASE

According to Porter (Porter, 1990), location plays a crucial role in achieving and maintaining competitive advantages:

- Despite the increased "leveling" of the world's economy, differences in the economies of countries and cities still exist and are far from negligible;
- Concentration of several industries' world's leaders in few countries establish the basis for a geographic concentration of competitive advantage;
- Companies can extend their reach but still keep important components of their global strategy and source of competitive advantage located in "home bases" (not always the original location, or located in just one country)

Four aspects are presented by Porter as explaining how the home market shapes the company's ability to compete (and succeed) globally. These aspects are discussed below, for the case of Topocart and in comparison with major global players in the industry.

5.2.1. Factor (Input) Conditions

To secure sources of innovation, scientific base and skilled labor, Pasco joined with Nanjing University and Berkeley Center of University of California and Hansa has a long lasting connection with University of Stuttgart, the most renowned in the field. A close, self-reinforcing relationship with local research and training institutions contribute to the formation of specific labor, the development of new technologies and the amplification of the company's reputation (a key success factor in this business). Brazil possesses few universities (even fewer in Topocart's geographic area of priority)

dedicated to the mapping field. Because of this, the majority of the innovations are imported from foreign companies and/or research institutes. This is an important shortcoming of the home-base location and must be complemented by a strong connection with a research hub in an advanced market (desirably Germany or the United States).

Global leaders in the industry underwent at least one major restructuring effort due to economic downturn or to a major change in demand or base technology, leading to crucial innovation cycles within the company (Blom was restructured in 2003 and started a frantic M&A initiative the following year and Hansa had to be rebuilt after WWII). Topocart was built in the digital era and in the wake of Brazil's post-stabilization growth period. Although lacking the strong corporate culture of these experienced organizations, Topocart has no ties with traditional, outdated practices and technologies, which shaped their early days and still influence their ways of doing business.

High-cost labor and resources in the developed countries where they are based (land, buildings, equipments, airplanes) put enormous pressure on productivity innovations, which led to continuous process and technology development. Only after decades of concentrating operations within the home base countries the companies started dispersing the production facilities to low-cost locations (Hansa started its facilities in India and China in the 1990's, Blom established production bases in Romania and Indonesia in 2004, and Pasco moved the bulk of its processing operations to Thailand in 2003, China in 2005 and India in 2006). Brazil enjoys relatively cheaper labor and infrastructure than developed countries. If this, in one hand, hindered productivity development, in the other hand enabled a cost advantage related to the company's overhead, which can't be matched by European and American companies.

5.2.2. Context for Strategy and Rivalry

Brazil, as many other countries, regulates strictly the aerial mapping activity, making sure licenses are given only to nationally-owned companies, which display financial health and adequate technical resources to operate. Despite this restriction, local companies such as Engefoto, Esteio and Base compete against each other, measuring forces in sales activities and sourcing innovations in the developed world. Brazil currently enjoys political and economical stability to sustain a suitable environment for rivalry, although the major players (Topocart included) tend to focus on regional silos.

Major global players enjoy similar situation in their home locations. European companies face fierce rivalry from neighboring countries which they try to protect themselves from with government regulations. The United States has a much more open market and has seen hundreds of small and medium size competitors thrive with very few large players but, oddly, with little global presence.

Topocart faces a reasonable amount of rivalry in its home location, which is an incentive for the whole local industry to progress more rapidly than elsewhere but, still, in a slower pace than in the developed countries. It seems that the conquest of a prime market is key for Topocart to become a global player.

5.2.3. Demand Conditions

Major global players serve a demanding, forward-looking customer base setting high standards, anticipating global trends and demanding special services that might be offered elsewhere. The tradition of investing heavily in planning and monitoring programs is strong in the US, Europe and Japan and enabled a reasonably steady demand, guaranteeing solid revenue streams.

The Brazilian market behaves as a "push" market, where the companies' offering shape the nature of demand, in opposition of a "pull" market, where customers set the pace of innovation. Topocart has sought higher, ever evolving standards as a form of differentiating itself from competitors not as an answer to increasing customer demand. Therefore, the local demand does not influence or anticipate the needs of global markets, an important shortcoming that hinders the ability of creating and maintaining competitiveness.

5.2.4. Related and Supporting Industries.

The industry is highly dependent on innovations generated by equipment suppliers. These suppliers, mainly concentrated in Europe but also present in the US and Canada, have been successful in commercializing and supporting their products worldwide and bear power in shaping the industry's operational standards.

Although it is not clear that companies closer to the European innovation hub enjoy technological advantage, every major player has at least one base in Europe (and particularly in Germany) to better integrate with suppliers.

In the last few years, a new sort of low-cost, specialized labor supplier has been developing. China and India are major sources and all the dominant players have traveled great distances to fully integrate with the motivated, well-trained (yet sometimes inexperienced) workforce in these locations.

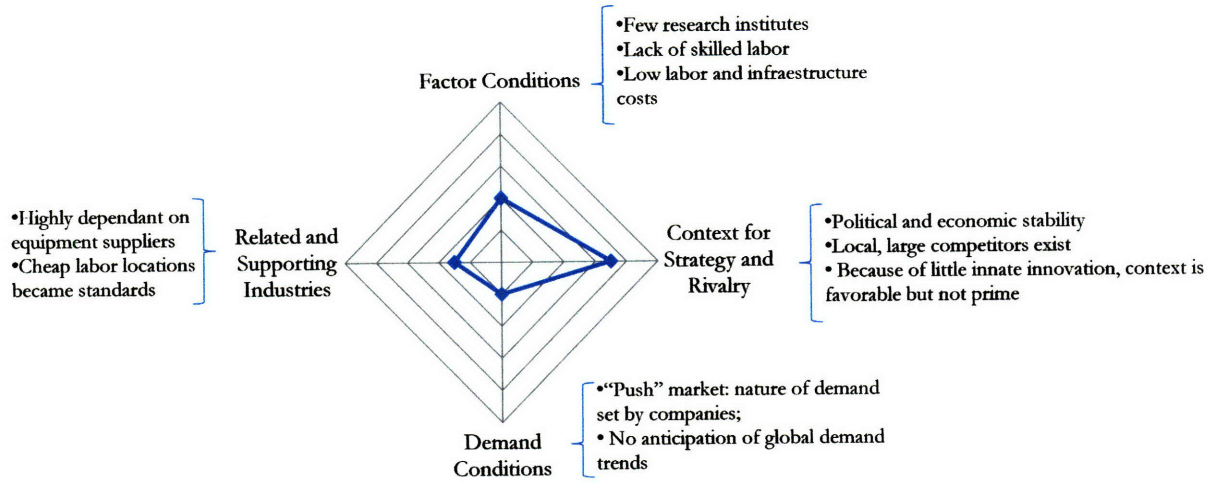

Figure 12 – Porter's diamond for Topocart's home location, Brazil

As Figure 12 clearly shows there are important weaknesses in Topocart's home location, which limit the capacity of the industry to produce global players and might hinder the company's expansion plan since, as Porter explains, real, sustainable arbitrage rises from local, systemic factors (knowledge relationships, motivation), inaccessible to foreign players.

Such an incomplete diamond is common in developing countries. According to Porter, exporters in developing countries have focused in advanced markets and not in their neighboring countries because of large similarities in the comparative advantages (such as low cost) and protectionist policies, making them competitors towards the same markets.

For Topocart to succeed internationally it must seek, over time, its own service, production methods or reputation, creating enough innovative capacity to expand, based in dispersed "home locations" that complement each other. In conclusion, the company must then seek a strategy that enables it to land in an advanced market in which its comparative advantages are powerful enough to grant it access while executing an energetic approach to building competitiveness. The main outcome of this study,

the company's orientation towards superior customer bonding, under the guidance of Delta Model, is key for achieving that.

5.3. THE TARGET LOCATIONS

According to Porter, not all multinational companies need a unified global strategy. Multidomestic companies (in which the success in each location is not interconnected with any other) must be approached with a set of domestic strategies, conferring a high degree of autonomy and power to the local operation. Truly global enterprises (which rely on the success of foreign locations to be successful globally), in the other hand, must define their strategy globally. In light of the degree of globalization in the industry and the weakness of the home base diamond, Topocart won't be successful unless it draws on the advantages each remote location can bring to the enterprise. Therefore, the target locations must be defined in order to enable collaboration between them, supporting a unified global strategy.

5.3.1. Current Global Configuration

Topocart can be classified as a "Home-based MNC" under Bartlett and Ghoshal's framework (Figure 13). There is currently no dispersion of the highest value added activities to abroad locations, and all directors work in the home base, Brazil. The company's culture is "broadcasted" from Brazil demanding the executives to travel to the abroad locations in order to carry out acquisitions, sales and other negotiations.

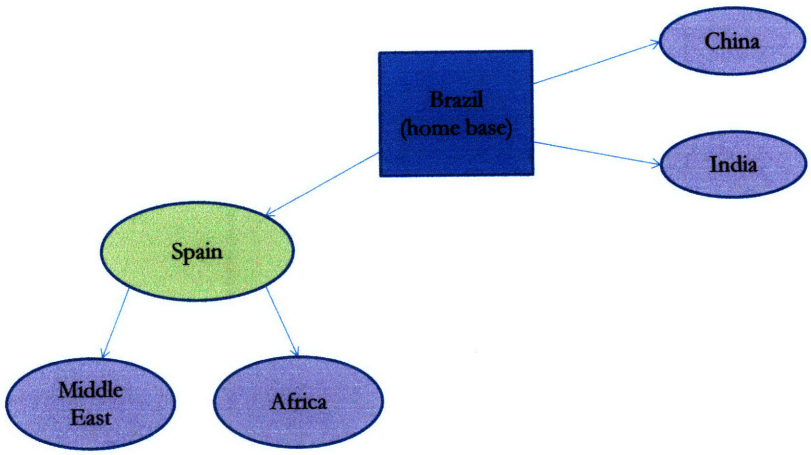

Figure 13 – Bartlett and Ghoshal's configuration for Topocart (Home-based multinational)

Production is mainly off-shored to China and India, where suppliers manage dedicated teams, trained and supervised by PM's and QA analysts in Brazil. This setting was created to realize economies of scale and face the highly-cyclical demand, a characteristic of the industry. The abundance of qualified man-of-work in China and India, and its low cost, make up for the difficulty of recruiting and training professionals in Brazil (where because of the scarcity of cartography schools, companies are usually charged with heavy training and complementary formation, resulting in high costs of substitution).

The Spain subsidiary manages the servicing of Africa and the Middle East customers and provides a connection to the equipment supply network, highly concentrated in Europe (Germany, Austria, Switzerland and Holland). These suppliers concentrate the majority of the R&D of sensor equipments (crucial to the development of the work) and serve the cartography industry worldwide. The Spain "hub" is a key subsidiary but doesn't develop business locally, rather coordinating the access to the Middle-eastern and African markets.

The Ferdows' strategic roles' framework was applied to each of these locations. The strategic roles for each location are detailed below (Figure 14):

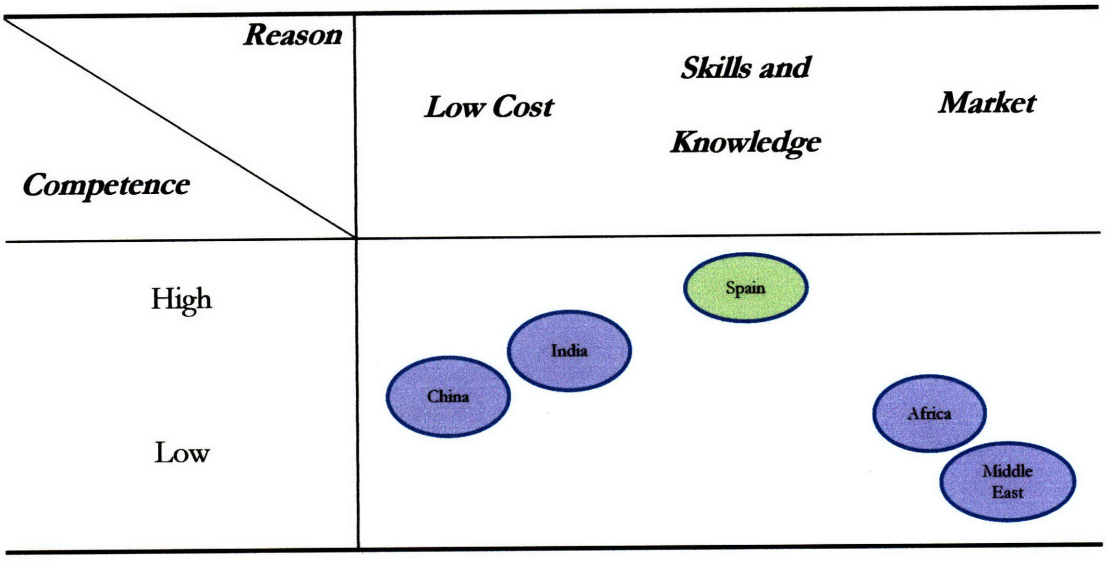

Figure 14 – Ferdows' strategic roles for Topocart's current locations

China and India operate as low cost and intermediate competence locations. As the integration with the home-base increases, with the addition of collaboration interfaces, enhanced technical capabilities and production capacity, it is likely that these locations will consolidate their positions as "sources" of knowledge and skill, rather than their current "offshore" status.

Spain was chosen for the access to skills and knowledge concentrated in Europe. Competence is regarded as high, making it a "lead" location.

Africa and the Middle East are locations that provide to markets with low competence, being "servers".

5.3.2. A New Global Base

According to Porter, global companies generally source the best "basket of inputs" but extract competitive advantage from its "home base", where functions like R&D, strategy development and core product development reside. As Porter says, the home-base is "the integration site for inputs and information sourced from global activities, and the most productive jobs are located there".

As noted in 5.2, Topocart's current home base suffers from weaknesses originated by the lack of intrinsic support conditions (such as research and education), related industries (software, equipment and service suppliers) and the "push"-nature of demand (clients are "told" what to expect). These characteristics will most probably hinder a globalization strategy centered in the current home-base. While it is unthinkable to exclude the Brazilian headquarters from the strategy, setting a different base specifically for the global expansion strategy seems to be imperative.

Figure 15 shows a broad assessment of the extent each world region could contribute to a successful global base. The size of the circles depicts the "quality" of the local market, which joins two Diamond dimensions: Demand Conditions and Context for Rivalry and Strategy.

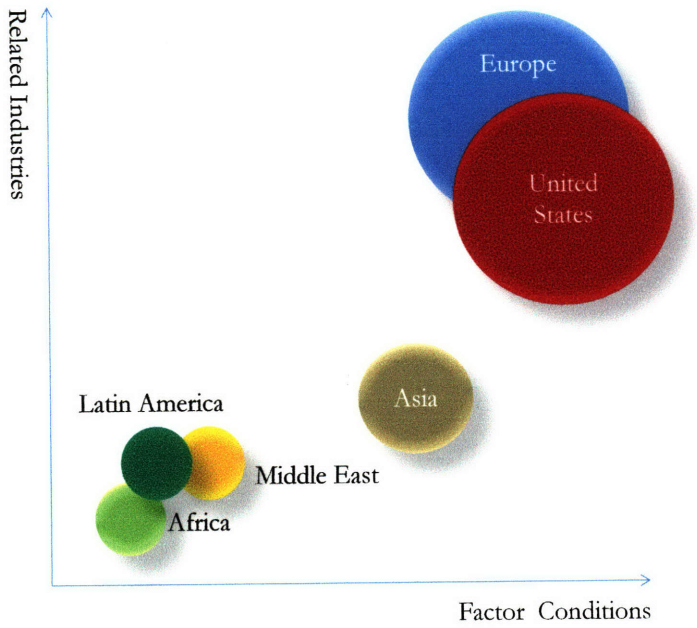

Figure 15 – "Home-base" capacity assessment

Latin America, Africa and Middle East share a small related-supplier network and sheer factor conditions which, in conjunction with a poor "quality" market (although far from negligible in volume), make these places unsuited for an global home-base.

Asia has grown to have stronger factor conditions (particularly infrastructure and education) and an increasing supplier network (focused on service and software), but still doesn't enjoy a prime market status, except for Japan.

Europe, as a region, has outstanding factor conditions, the most important concentration of related industries in the world and high-quality demand and market conditions. The US has a similar setting, except for the supplier network, which is inferior compared to Europe. These two regions clearly host the best conditions for Topocart's global base.

United States vs. Europe as Topocart's Global Home-base

The potential for integration with the home base is a crucial criterion to define the global base, in our view. That is because the home base hosts critical, non-replicable resources (such as the high administration) whose integration with the global strategy is highly desirable. In other words, a global base must be "close" enough to home that it can build on the home base existing competencies but far enough so that it doesn't get influenced by its environmental conditions (or the Diamond). Ghemawat's CAGE "distance" provides an adequate measure of the potential integration one can expect between two separate corporate locations. For the analysis, Spain was selected as the position in Europe, because it already hosts an office and has strong connections with Topocart's owner (a descendant of Spaniards), and Florida was pre-selected as the position in the US because of its strategic location, within a growing region in the US and its global connections. Table 31 summarizes the application of the CAGE framework, which is detailed below.

	Cultural Attractions	*Administrative Attractions*	*Geographic Attractions*	*Economic Attractions*
United States (Florida)	• American culture is pervasive to Brazil • Cons: Language	• "Laissez-faire" • Least regulated market • More accessible to foreign investment, incorporation and management	• Closer to home base • Well connected airport • Small time difference • Similar weather	• Larger direct-access market • Stronger "country" brand
Spain	• Similar ethnicity and religion • Language more accessible • Cons: Spaniards are not perceived as honest	• Cons: Bureaucracy and excess of regulations	• Closer to Africa, Middle East and the supplier network	• IVA return on UE purchases • Stronger currency

Table 31 – CAGE analysis comparing Spain vs Florida, from the Brazilian headquarters perspective

- **Cultural attractions:** The fact that Brazil is inserted into Latin America doesn't make it closer to its Spanish-colonized neighbors. Although Portuguese and Spanish share a common origin, the cultures are very different. That translates into divergent business-making styles and integration barriers. However, although American culture is familiar to the average Brazilian, the cultural connections between Brazil and Spain are still more relevant than with the US. English is still not a common second language in Brazil, while most Brazilians can understand and be understood in Spanish.
- **Administrative Attractions:** America is far more accessible to foreign business than any other country in the World. Requirements and procedures to invest, incorporate companies and manage them are much simpler than in Spain. There, the simple act of starting a venture can take months and thousands of Euros to complete and no foreigner is allowed to manage a Spain-based company. The US is also the least regulated market regarding the mapping and survey industry, being remarkably open to foreign companies. The entrepreneurial scene in the US, and particularly in Florida where several incentives are in place, is much more attractive the in Spain. Here, the cultures clash, with Catholic-based Spain being much more bureaucratic (much like Brazil) and less business-friendly than the "laissez-faire", pro-profit US environment.
- **Geographic Attractions:** Florida is much closer to Topocart's home base than Spain which, in the other hand, is better located in regard to the client-base in Africa and the Middle East and the supplier network (concentrated in Europe, China and India). Although Spain offers a good coordination location for the supply chain and neighboring markets, its distance (and time difference – 5 to 6 hours) from Brazil doesn't facilitate the connection with the home-base. Florida is extremely well connected to the world through Miami Airport, making it easier

to reach Europe, Africa and the Middle East than from Brazil. It also provides a privileged point-of-access to northern Latin America and North America.

- **Economic Attractions:** the US provides access to a larger, more stable, more homogeneous market than Spain, because the States, although independent, are far more integrated than the countries in the UE, Africa and Middle East. While in such countries, building a sales network requires several country-specific people and resources, the US is much more accessible with a single approach. Regarding intangibles, an US-based company is often rendered more recognition than a Spain-based one. Spain offers several economic incentives, such as the IVA return for UE-based purchases (which can significantly lower the investment) and a stronger currency.

5.3.3. Conclusions

The US (and the pre-selected location, Florida) offers important advantages over Spain for hosting the global base, notably the geographic distance from the home base, the fairly unregulated access to the market, the market size and the business-friendly environment. On the other hand, it's crucial to acknowledge the Spanish subsidiary's key role in integrating the supply chain and serving the relevant client-base in Europe, Africa and the Middle East.

5.4. EXPORTING THE BUNDLE OF COMPETENCIES

Topocart's bundle of competencies, as mapped in 4.3, can be summarized in two major groups:

- **Pre-sale competencies:** The ability to restrict access to competitors by locking customers in through a strong support network, from the policy inception. This ability is crucial in developing countries, where the demand for Topocart's services is usually hindered by the buyers' lack of knowledge or experience in the field. In these countries, the government is the main contractor of large scale projects and has great need of support during the needs assessment phase. Being at arm's length provides Topocart with an anticipation of the demand and an opportunity to develop a strong reputation, which will count in the company's favor in the tender process.
- **Post-sale competencies:** Topocart possesses several technical competencies related to the client's final job (infrastructure engineering design, urban planning and environmental studies) which allows for a level of integration that is impossible for the regular mapping company. These competencies, however, currently lie latent and must be marketed more efficiently to the client. The analysis in 4.3 yielded a new concept dubbed "Workbench" that will support an enhanced bonding with, particularly, clients in Tiers 2 and 3.

These competencies form the bulk of Topocart's market power within the home market and, as such, will also be central to its strategy in the new market, at least initially. Therefore a discussion of whether or not these competencies are exportable, and to which locations, is desirable. The following sections apply Lessard's RATs test to each group of competencies to the new locations assessed in 4.4.7 to be the desired international geographic scope.

5.4.1. Pre-sale Competencies

New Geographic Scope	*Are the **pre-sale** competencies...*		
	***Relevant?** (Similar customers, needs, appeal, channels?)*	***Appropriable?** (Access to/power with channels, advisors?)*	***Transferable?** (Have we done it before? Does organization support?)*
South America	Yes	Since these are proposed new locations, the company must develop access and power with channels	The company has extensive experience in applying these competencies but, for the same reasons, not in these locations
Central America	Yes		
United States and Canada	No		
Southern Africa	Yes		
Northern Africa and Middle East	Yes		
Europe	No		
Angola	Yes	Yes	Yes

Table 32 – RATs test applied on the "pre-sale" set of competencies

- **Relevant:** developing countries share the central role the government plays in contracting large scale projects and also the lack of technical specialization of government officers. The ability to serve these officials is relevant in such places. In developed countries, however, it is more likely that the government sections dealing with professional services are much more equipped to set the strategy and apply it, due to the longer history of technology use and the access to better education networks.
- **Appropriable:** depending on the local culture, government officers are more or less accessible to pre-sale support. In places where discussion is not open, the misalignment between the bid

requirements and best practices makes it difficult to deliver the best solution, and usually the company's efforts are focused in bridging that gap. The company currently has limited access to channels in the new markets but it has employed successful strategies to gain access. In Angola, for example, it has teamed up with Brazilian engineering companies operating there, for the first projects and then established stronger channel access. This is a replicable strategy since the Topocart is a strong partner of the major Brazilian engineering firms, which are connected in the majority of the locations listed above.

- **Transferable:** These competencies are immediately transferable since the company has been proficient in applying them. A vast number of developing countries share Brazil's needs and shortcomings in the infrastructure realm. The challenges are how to scale the support, since it depends on a number of key people in the company and how to overcome cultural differences such as language and local customs, without reducing the effectiveness achieved so far.

Table 32, above, summarizes the discussion.

5.4.2. Post-sale Competencies

New Geographic Scope	*Are the* ***post-sale*** *competencies...*		
	Relevant? *(Similar customers, needs, appeal, channels?)*	***Appropriable?*** *(Access to/power with channels, advisors?)*	***Transferable?*** *(Have we done it before? Does organization support?)*
South America	Limited relevance	Since these are proposed new locations, the company must develop access and power with channels	The company has experience in applying these competencies but not in a customer-oriented bundle
Central America	Limited relevance		
United States and Canada	Yes		
Southern Africa	Limited relevance		
Northern Africa and Middle East	Limited relevance		
Europe	Yes		
Angola	Limited relevance	Yes	Yes

Table 33 – RATs test applied on the "post-sale" set of competencies

- **Relevant:** The pre-sale competencies already place institutional clients in developing countries in the highest possible competitive position in the Delta Triangle reducing the "Workbench" approach's relevance. The reason is that, for these cases, the "Workbench" is not the mandatory path to achieving customer lock-in. Because of the lack of internal resources these client portray, lock-in can be achieved without the necessary offer of Total Customer Solutions. In more competitive and developed markets, however, the regular Delta Model flow (from Bet Product to Total Customer Solutions to Customer Lock-in) is observed, hence, the higher relevance of the post-sales competencies.

- **Appropriable:** As discussed above, the company must replicate and complement its market forming strategies to the new markets.
- **Transferable:** The company has extensive experience in working with the client's body of knowledge but never bundled these offering in a structured setting in order to bond with them. The "Workbench" approach, introduced in this work, is a new concept that, although drawing from existing capabilities must be given form and expand, serving the client's specific needs

Table 33, above, summarizes the discussion.

5.4.3. Conclusions

The RATs test was applied to both the pre-sale and post-sale competencies of the firm resulting in the following recommendations:

- Focus on pre-sales capabilities when approaching developing countries' markets. Brazil is an appropriate home-base for this thrust, because it concentrates the related resources and knowledge base, as well as the coordination actions;

- Apply and develop post-sales competencies (the "Workbench") when advancing on developed countries' markets. That might require local resources to support the adaptation to the new market which are not present in the home base. The proposed global base (the US) should head this thrust with close coordination with the Spain office;

- Proven strategies, such as leveraging the engineering firms' networks must be used when entering new markets, in both developed and developing countries.

6. Strategic Agenda

The discussions in the previous sections pointed out several conclusions and recommendations that must be considered when setting a strategic agenda for Topocart:

- The company has already achieved superior customer bonding with its most significant customer tier, the government client, and must use that expertise (pre-sale competencies) in expanding to market in developing countries, which share structural similarities and which are accessible to Topocart via a global network of Engineering Services companies;
- The private client, a fast-growing segment in the Brazilian operation, portrays an untapped business potential, related to the end use of the services Topocart provides (post-sale competencies). Topocart possesses the competencies (unique amongst its competitors) to capture the additional share of the customer's wallet but, currently, they are neither bundled as an offering nor aligned towards enhancing customer bonding. The study has identified advantages in developing a new line of service (dubbed the "Workbench") not only for the home market but also to support expansion to developed countries, where it is imperative for the company to market its own, distinctive offerings. In addition to the specific technical resources associated with the Workbench, the company must implement systems such as customer relationship management, geographic data management, knowledge and resource management, pricing and billing to better realign the company's competencies. Last, but not least, there will be the need to train and hire personnel to sell, deliver and support the new offerings;

- Topocart must continue its global market expansion drive, initiated by the setting of the Spain office and the works in Africa. To support it, Topocart must set a base for the global operations in the United States, to offset the Brazilian market's shortcomings (in terms of related industries, factor and demand conditions) which, if not mitigated, will most likely hinder the expansion plans and to build on the important business opportunities in the region. The global base must be closely integrated with the Brazilian headquarters, exchanging knowledge, resources and support and hosting R&D, strategy development and product development. The Spain subsidiary must emerge as a coordination office, linking the supplier network and accessing the neighboring markets, Europe, Africa and Middle East. Standardization, information exchange and worldwide responsibility allocation, supported by IT resources must be developed to support the integration efforts. Sales and marketing plans must be implemented to access channels in the new locations, with focus in the US, Africa and Middle East. The plans must consider the adequate offerings and approaches to each market, as discussed in this work. Partnering must be considered but the firm should not rely on a partner to secure a competitive advantage. As Porter indicates, the best alliances are situational, temporary and must dissolve after the goals were achieved.
- Human resources policies towards the global integration must be developed, following Porter's suggested guidelines: a) provide a clear understanding of the global strategy, b) enable local managers to acknowledge the impossibility to achieve global strategy goals from their single locations therefore setting activities to reinforce it and not undermine it, c) information systems have to be made consistent worldwide, d) personal ties amongst regional managers must be cultivated in order to foster cooperation and learning, e) incentives must acknowledge overall contribution as well as branch success.

- The supply chain based in India and China is key to the development of the new markets, supporting the appropriation of economies of scale and scope and offering cost advantages. These suppliers, which today operate rather independently from Topocart's strategy, must be further integrated with the company. Resource and knowledge management systems must be improved to support high responsiveness and an appropriate connection with the company's innovations. Intellectual capital protection measures must be implemented.

The Strategic Thrusts are presented in the next few pages.

Corporate Strategic Thrusts	*Organizational Units*						*Business Processes*	*Performance Measurements*
	Supply Chain	*Administrative*	*Sales and Marketing*	*Business Devmt.*	*Presidency*	*Strategic Partners*		
Align and complement competencies								
Define the "Workbench" main offerings	2	3	2	1	3	3	B/CT/I	New service, resource and business model definition
Acquire resources to support the offerings	1	3	2	1	3	3	OE/I	Revenue associated with deployed Workbench solutions
Innovation Committee	2	3	2	1	3	3	CT/I	Innovation time-to-market and Workbench-related revenue growth and retention
Build internal infrastructure								
Implement technical resources	1	2		2	3		OE	Support applications availability and capacity
Implement administrative resources	2	2	2	1	3		OE	Migration of management tasks to the new systems
Incorporate the US office	3	2	2	1	2		OE/CT/ I/B	Revenue generated and connections with innovation resources
Upgrade the Spain office	2	2	3	2	1		OE/I	Production management responsibilities over the Asian network transferred from Brazil
Improve Off-shore Supply Chain	1	2		2			OE	Shorter time-to-production after order and total lead-time, higher final product quality
Capture Market Share								
Angola		2	1	1	2	3	CT/B	Dedicated sales resources to serve the Angolan market
Africa and Middle East		2	1	1	2	3	CT/B	Regions covered by strategic partnerships

Brazil		2	1	1	2	3	CT/B	Post-sale revenues associated with Workbench offerings
United States		2	1	1	2	3	CT/B	US-based revenue generation

Table Legend:

1 - Identifies the "Champion," who takes leadership for the strategic thrust execution

2 - Key role in formulation and implementation

3 - Important role of support and concurrence

B - Business Model

OE - Operational effectiveness

CT - Customer Targeting

I - Innovation

6.1. ALIGN AND COMPLEMENT COMPETENCIES

The basis for the proposed global strategy is a successful alignment of the company's competencies with an innovative offering approach, the Workbench. This section describes strategic thrusts necessary to align, prepare and acquire competencies to support the implementation of the concept as well as to assure that the further developments continue to serve the original proposition, yielding superior customer bonding capabilities to the organization.

6.1.1. Define the Workbench main offerings

The Workbench concept must be solidified through market research and internal discussions cycles, where each client's specific needs will be assessed and modeled using the company's current and acquired competencies as building blocks. Each client's needs assessment phase, although unique, must contribute to a whole body of offerings and, step by step, build the company's ability to deeply engage in each client's final job. The business model must also be defined in this phase.

Name:	Define the "Workbench" main offerings
Description:	Describe how and which offerings will be marketed to each client in order to secure a continued involvement and a superior bonding throughout the execution of the client's final job.
Responsible Manager:	Business Development Director
Other Key Participants:	Sales and Marketing and Supply Chain Directors
Other Important Contributors:	CEO and Administrative Director
Key Indicators for Management Control and Targets:	New service, resource and business model definition
First Milestone Description:	First "Workbench" Needs Assessment Phase
First Milestone Date:	2 Months after start of Strategy
Resources Required:	Sales and technical resources to assess and model customer needs
Statement of Benefits:	Definition of the internal resources needed, the benefits for the client and the business model for the Workbench offerings.
Vulnerabilities:	Time spent on defining the appropriate new resources required to define the offerings

6.1.2. Acquire resources to support the offerings

The new resources defined in the previous phase must be acquired and integrated by the company in order to deploy the Workbench offerings to the clients. This must involve the hiring and training of technical and sales people, the definition of standardized procedures, the selection and acquisition of technology and equipment. Similarly to the previous phase, it will be focused on each client specific needs and demands but must contribute to creating a consistent, replicable set of competencies.

Name:	Acquire resources to support the offerings
Description:	Hiring and training of technical and sales people, definition of processes and selection and acquisition of technology to enable Workbench offerings
Responsible Manager:	Supply Chain Director and Business Development Director
Other Key Participants:	Sales and Marketing
Other Important Contributors:	CEO and Administrative Director
Key Indicators for Management Control and Targets:	Revenue associated with deployed Workbench solutions
First Milestone Description:	Deployment of first set of solutions to customer
First Milestone Date:	5 Months after start of Strategy
Resources Required:	Human, technical and financial resources to assess and acquire the capabilities needed
Statement of Benefits:	Make available the capabilities to deploy the first Workbench solution
Vulnerabilities:	Time and financial resources spent on acquiring the capabilities. Technical problems related to "version 1.0" deployments.

6.1.3. Innovation Committee

The committee will evaluate and steer the Workbench program to make sure it is serving the general goal of supporting the company's continuous alignment with the client's final job and enhancing customer bonding. It will also evaluate the latest innovations available and ensure that the new developments fit into the broader scope. The committee might also get involved in a particular client demand that exceeds the Workbench team's powers or competencies.

Name:	Innovation Committee
Description:	Steer and evaluate the Workbench Program ensuring the achievement of superior customer bonding and that the latest developments reach the client
Responsible Manager:	Business Development Director
Other Key Participants:	Sales and Marketing and Supply Chain Director
Other Important Contributors:	CEO and Administrative Director
Key Indicators for Management Control and Targets:	Innovation time-to-market and Workbench-related revenue growth and retention
First Milestone Description:	Members' election, first meeting and mission statement
First Milestone Date:	1 Month after start of Strategy
Resources Required:	Key personnel from the organizational units and financial resources for trips and pilot projects.
Statement of Benefits:	Maintenance of the program main goal and its continuous innovation drive
Vulnerabilities:	Members' schedule unavailability and lack of financial resources might hinder the committee's goals.

6.2. BUILD INTERNAL INFRASTRUCTURE

The previous thrusts will demand the organization in support areas, such as customer management and IT. The thrusts in this section intend to provide the organization with the necessary infrastructure to support not only the development and deployment of the offerings but also the perpetuation of the knowledge generated.

The new infrastructure's success is also related to thrusts carried on by the US and European offices and the offshore supply-chain, which are also discussed in this section.

6.2.1. Implement technical resources

The technical resources not directly related but supporting the Workbench offerings encompass IT infrastructure (storage, data warehousing and network solutions) and personnel. The infrastructure will support applications such as the "Knowledge Base" (a structured repository of cases and expertise guides) and the "Client Locker" (a secure geographic database realm where the client data resides throughout the job's execution).

Name:	Implement technical resources
Description:	Acquire and implement IT resources and hire/train personnel to support the Workbench program.
Responsible Manager:	Supply Chain Director
Other Key Participants:	Administrative and Business Development Directors
Other Important Contributors:	CEO
Key Indicators for Management Control and Targets:	Support applications availability and capacity
First Milestone Description:	"Knowledge Base" and "Client Locker" applications successfully implemented
First Milestone Date:	4 Months after start of Strategy
Resources Required:	IT resources and personnel and financial resources
Statement of Benefits:	Support for the Workbench execution teams and innovation process.
Vulnerabilities:	Failure to allocate adequate resources or select incomplete or inadequate technology and solutions.

6.2.2. Implement administrative resources

To cope with the increasing complexity of the offerings and the customer relationship, the organization must implement enterprise management systems (BI, CRM, ERP – with Billing).The systems must be integrated throughout the global organization and fully scalable and customizable, preferably distributed over the internet.

Name:	Implement administrative resources
Description:	Procure and implement BI, CRM, ERP and Billing systems
Responsible Manager:	Business Development Director
Other Key Participants:	Administrative, Sales and Marketing and Supply Chain Directors
Other Important Contributors:	CEO
Key Indicators for Management Control and Targets:	Migration of management tasks to the new systems
First Milestone Description:	CRM implementation
First Milestone Date:	4 Months after start of Strategy
Resources Required:	IT resources and personnel and financial resources
Statement of Benefits:	Improvement of management efficiency in a complex business environment.
Vulnerabilities:	Failure to allocate adequate resources or select incomplete or inadequate technology and solutions.

6.2.3. Incorporate the US office

The goals for the US office are to serve both as point of access for Topocart's competencies to the American market and as a connection to a stronger diamond, supporting the company's global strategy. The office must be incorporated in Miami, Florida, acquire minimal internal resources and support a marketing and sales strategy focused in the local engineering companies and government projects. The office's initial goal is to acquire market share in the Southeast market with mapping offerings with the full support of Topocart's existing supply chain. The Workbench approach must be tested in the market and shaped accordingly. To serve the first-priority goal, the office must be furnished with IT systems integrating it to the Brazilian headquarters and the Spain office and personnel to cover sales operation, project management and a Country Manager (preference must be given to Portuguese/Spanish speakers). As a second-priority goal, the office must acquire and/or partners with resources that support marketing strategy, R&D and product development. It must also concentrate the Business Intelligence related to the global strategy setting. The innovations generated by the US office must be evaluated by the Innovation Committee for application in the home-base on other markets. The office might also be called in to solve specific client problems that require innovative application of technology and, therefore, must develop connections with research and training centers, as well as with the supplier network in the US.

Name:	Incorporate the US office
Description:	Incorporate the company's representation in the US (Miami, FL).
Responsible Manager:	Business Development Director
Other Key Participants:	CEO and Administrative Director
Other Important Contributors:	Sales and Marketing and Supply Chain Directors
Key Indicators for Management Control and Targets:	Revenue generated and connections with innovation resources
First Milestone Description:	First US-based contract
First Milestone Date:	2 Months after start of Strategy
Resources Required:	Country Manager, Sales and Project Management personnel, IT integration and financial start-up resources
Statement of Benefits:	Generate revenue, connect the home base with superior support resources and foster innovation for the global operation.
Vulnerabilities:	Barriers of entry, regional economic slowdown, shortage of certified professionals

6.2.4. Upgrade the Spain office

The Spain office must coordinate with the European technology supplier network and the China-India supply-chain. An office manager with connections in the European industry and research institutions must be brought in, along with production managers. IT resources must be implemented to integrate the office with the global enterprise. The office might also support the Workbench offerings worldwide by sourcing innovation and specialized man-of-work locally. The operations in Africa, Europe and the Middle East will also be supported by this office, however, in order to realize economies of scale and favor the standardization and integration of the enterprise, project management will be carried on by the Brazilian and American offices.

Name:	Upgrade the Spain office
Description:	Install coordination capabilities (with technology supplier network and Asia-based supply-chain)
Responsible Manager:	CEO
Other Key Participants:	Administrative and Business Development and Supply Chain Directors
Other Important Contributors:	Sales and Marketing Director
Key Indicators for Management Control and Targets:	Production management responsibilities over the Asian network transferred from Brazil
First Milestone Description:	Country manager and production managers hired.
First Milestone Date:	2 Months after start of Strategy
Resources Required:	Country Manager and production management personnel, IT integration and financial start-up resources
Statement of Benefits:	Manage European and Asian-based operational resources for the global operation, and connect the home base with superior support resources.
Vulnerabilities:	Barriers for foreign incorporation and control, lack of qualified, well connected personnel

6.2.5. Improve Off-shore Supply Chain

The Asian-based supply-chain must be further integrated with the enterprise through the implementation of information systems to enable collaboration and manage, minimally, the resource allocation, production goals and reports worldwide. Technical procedures and data formats must be standardized through training and collaboration tools. The management of the Asia-based supply-chain must also include expand the sourcing not in scale, but also in scope, to include other areas such as design, publishing and GIS and better support the Workbench approach.

Name:	Improve Off-Shore Supply-Chain
Description:	Expand and integrate the Asian-based supply-chain, and improve its management
Responsible Manager:	Supply Chain Director
Other Key Participants:	Administrative and Business Development Directors
Other Important Contributors:	
Key Indicators for Management Control and Targets:	Shorter time-to-production after order and total lead-time, higher final product quality
First Milestone Description:	IT management and collaboration platform installed in main suppliers.
First Milestone Date:	2 Months after start of Strategy
Resources Required:	IT integration platform and financial resources
Statement of Benefits:	Final quality improvement, enhanced scope and scale, better dependability and full realization of economies of scale.
Vulnerabilities:	Language and cultural barriers

6.3. CAPTURE MARKET SHARE

In this section, marketing and sales thrusts regarding the priority markets the company is accessing now or is planning to access in the near future are defined. The thrusts draw on the customer segmentation developed previously and the Workbench approach to set different strategies to each market. These thrusts must be further developed by the responsible managers to generate detailed Sales and Sales Management plans.

6.3.1.Angola

Topocart already enjoys a strong competitive position in Angola, whose client base resembles the Brazilian Tier 1 customer, the highest bonding level. A strategic partnership with a local engineering company allowed for channel access in a very short time. The sales operation is shared between the local company and the Brazilian headquarters. There is no reason to change this approach since the Brazilian sales organization is highly skilled in dealing with potential Tier 1 customers. Foreign investment institutions also are customers interested in the country and can be classified in Tiers 2 and 3, being better served by the Workbench sales team, based in the US office.

Name:	Angola
Description:	Define and implement a sales and marketing plan for the Angolan market.
Responsible Manager:	Business Development and Sales and Marketing Directors
Other Key Participants:	CEO and Administrative Director
Other Important Contributors:	
Key Indicators for Management Control and Targets:	Dedicated sales resources to serve the Angolan market
First Milestone Description:	Strategy is already in place, having started with the partnership between Topocart and the local company
First Milestone Date:	
Resources Required:	Sales resources to assess customer needs, place bids and follow-up
Statement of Benefits:	Lock-in of the main customers in the country, securing market share
Vulnerabilities:	Cultural differences, bureaucracy, social, political and economic instability

6.3.2. Africa and Middle East

From its positions in Angola and Spain, Topocart must act to tap the business potential in the remainder of the African continent and the Middle East. The strategy to enter these markets will be based in Topocart's connections with the Brazilian engineering companies' working on the area, which serve Tier 1-type customers and need technically sound partners to support them. Similarly to the Angolan strategy, FDI-based opportunities (potentially Tier 2 and 3 customers) will be served by the Workbench sales team.

Name:	Africa and Middle East
Description:	Define and implement a sales and marketing plan for the remainder of the African continent.
Responsible Manager:	Business Development and Sales and Marketing Directors
Other Key Participants:	CEO and Administrative Director
Other Important Contributors:	
Key Indicators for Management Control and Targets:	Regions covered by strategic partnerships
First Milestone Description:	First partnership outside Angola
First Milestone Date:	4 Months after start of Strategy
Resources Required:	Sales resources to assess customer needs, place bids and follow-up
Statement of Benefits:	Servicing of the main customers in the country, securing market share
Vulnerabilities:	Cultural differences, bureaucracy, social, political and economic instability

6.3.3. Brazil

The rather weak market position in Tiers 2 and 3 must be improved by an aggressive strategy to market Workbench offerings to existing clients. The attractiveness test (developed in 4.2.2) must be applied to each client and, if suitable, a Workbench sales team must make contact and proceed with needs assessment and the sale. A pilot project must be negotiated with a client to start this strategy, and support the other strategies related to the implementation of the Workbench approach (6.1.1, 6.1.2, 6.1.3, 6.2.1, 6.2.2 and 6.2.5).

Name:	Brazil
Description:	Define and implement a sales and marketing plan for the Workbench offerings in Brazil.
Responsible Manager:	Business Development and Sales and Marketing Directors
Other Key Participants:	CEO and Administrative Director
Other Important Contributors:	
Key Indicators for Management Control and Targets:	Post-sale revenues associated with Workbench offerings
First Milestone Description:	First Workbench contract
First Milestone Date:	4 Months after start of Strategy
Resources Required:	Sales resources to assess customer needs, close the sales and follow-up
Statement of Benefits:	Increase of market share and improvement of customer bonding in Tier 2 and 3
Vulnerabilities:	Insufficient technical resources, cultural misalignments with customer

6.3.4. United States

The US market must be entered with a gradual approach, in which Topocart will first offer processing services to engineering services companies and other mapping companies. Topocart will perform direct sales to private companies and government institutions, and draw on the Workbench capabilities to be flexible and innovative in serving the clients. The efficiency advantages provided by the Brazilian headquarters and the off-shore supply-chain are also key factor for the strategy's success. In a later stage, the American office will operate with the aerial phase, presenting itself as a full-fledged competitor.

Name:	United States
Description:	Define and implement a sales and marketing plan for the US market.
Responsible Manager:	Business Development and Sales and Marketing Directors
Other Key Participants:	CEO and Administrative Director
Other Important Contributors:	
Key Indicators for Management Control and Targets:	US-based revenue generation
First Milestone Description:	First US-based contract
First Milestone Date:	4 Months after start of Strategy
Resources Required:	Sales resources to assess customer needs, close the sales and follow-up
Statement of Benefits:	Capture of US market share and start of innovation cycles associated with the advanced demand
Vulnerabilities:	Insufficient technical, sales resources, cultural misalignments with customer

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