

The Official Magazine of the International Association of Outsourcing Professionals

# GlobalizationToday

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*Commerce Redefined*

## THE GLOBAL OUTSOURCING 100

*The Leaders Who Earn a Seat at the GO100 Table*



### Also in this issue:

*Our Criteria for Making the GO 100*

*How Outsourcing is Transforming Aerospace*

*Improving Troubled Outsourcing Relationships*

# Tigers, Bears and Dragons...Beware!

*Here's why aerospace outsourcing in Latin America is flying high and challenging other fast-growing areas*

By Oscar S. Garcia

The aerospace industry has emerged from the brutal 2008-2010 global recession unscathed, relative to other capital intensive industry sectors. Excluding some of the lower segments of the general aviation sector, small private aircraft, the 2010 industry wide production and financial results were robust. The 2011-2030 forecast consensus from both private and public sector project global growth two to three times the global GDP's.

A lot has been said in the media regarding Boeing growing pains due to the new 787's "extreme outsourcing" fiascos, resulting in more than two years of delays, cancellations, revised profits projections and break even points.

Indeed, if a picture is worth a thousand words, looking at the one to the right clearly shows how outsourcing has exponentially grown on Boeing's 787 programming as compared with previous Boeing programs in less than two decades.

It would be wrong, however, to extrapolate from this singular case that the aerospace industry has gone too far in its globalization efforts. Indeed, the aerospace industry is in its infancy in terms of globalization and outsourcing volumes. Indeed, only a mere 3% of the major vehicle programs are outsourced

to foreign, emerging and low cost economies. Thus aerospace outsourcing opportunities and growth abounds, but not at less than the speed of flight, which means, slower than other mature

outsourced intensive industries such as consumer electronics, automotive and large industrial equipment, which outsource 85%, 33% and 18% respectively, as per the following chart.

## Slow to move

### Distribution of manufacturing

■ High-cost countries ■ Low-cost countries<sup>1</sup>



<sup>1</sup> Measured in number of units (for TV, automotive aerospace).

Source: Global Insight; McKinsey analysis



### Factors influencing aerospace industry

#### Unique structural attributes

- Low volume, high customization
- High level of government support
- Complexity of technology, intellectual property, and military requirements
- High government safety certification and ramp-up costs
- Very high quality and safety requirements

#### Business practices

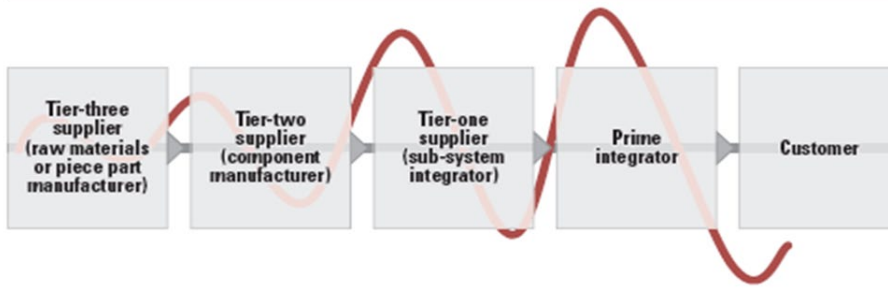
- Limited standardization (R&D and manufacturing)
- Limited product maturity at launch time—ie, many design changes occur after start of production
- Lack of permanent supplier-development teams (such as those in auto industry)

Aerospace's less than flight speed of outsourcing and shallow growth is due mainly to its inherent industrial DNA traits such as the intense startup capital, high customization, relatively low production volumes, thin financial margins, unforgiving-complex regulatory environment (the aerospace sector is the highest regulated industry only second to nuclear power and more than 10 times more strict than other such as the automotive world). In addition, last but not least, aerospace needs an outsourced labor "culture" of excellence, creativity and innovation, even for the simplest of tasks, such as small component manufacturing or sheet metal maintenance and repair.

Let's not forget that one of the main 787 program delays was caused by the lack of a small part called "fasteners", a very small yet specialized part used to join structural wing and fuselage panels, something like a bolt to hold composite material parts together. Yet, these very inexpensive small parts caused a very expensive program delay and logistics bottleneck.

, number of people employed (for large industrial equipment), or sales (for

Supply fluctuations are magnified as they progress down the supply chain. A little snap of the curve at the supplier end ripples down toward the customer in successively higher peaks and wider troughs.



Source: A.T. Kearney

Shifting gears to aerospace outsourcing geopolitics, the world has heard of recent large orders from airlines and armed forces in India, China and Russia, which in turn have given the impression in both mainstream media and aerospace industry circles, that those Tiger, Dragon and Bear economic powers are jointly shifting aerospace consumption center of gravity their way. But indeed, they only account for 15% of the global market; their growth numbers are very large, as compared with mature economies like the USA and UK, but small in total numbers as they draw from a comparatively small aircraft and other flying vehicles established base.

Moreover, and going to our point in this article, what is less known is that the Latin American “axis”, comprising of Mexico, Central America, The Caribbean and South America, account for a good 10% of the global aerospace market, both in air transport as well as in defense, security and special mission programs. Lodged squarely within South America is Brazil, which by some aerospace metrics and accounts is large enough to be characterized as a sub region in the Americas.

Now, I must mention that from a global perspective, the Americas region hosts three of the four leading aerospace aircraft Original Equipment Manufacturers (OEM's); Bombardier (Canada), Boeing (USA) and Embraer (Brazil) with a combined market share of close to 75% of gross aircraft OEM output. An interesting picture commences to emerge for the outsourcing executive and strategic minds.

Brazil is the clear leader of the emerging BRIC countries block in mainstream economics. However, when it comes to

aerospace, most studies and analyses exclude it from the emerging aerospace economies statistics and outsourcing trends and characterize it as an established economy. In my opinion, this is “plane” wrong, and steals a lot of the aerospace outsourcing “thunder” that the region has to offer.

The reason is that, just like Russia, which is considered an aerospace emerging country albeit its industry dates as far back as that of the US, Brazil should be even more so. Brazil's aerospace industry is for example, about half as old as Russia's or roughly 50 years old.

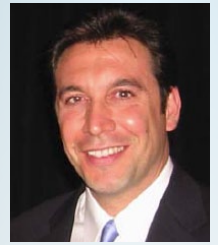
Now that we have set some of Latin America's aerospace record straight, we can objective look at the very enticing aerospace outsourcing opportunities in Latin America from a level playing field. We must use Brazil as the benchmark of what is possible, which is a lot and growing rapidly.

Looking at the chart below, one can quickly see that Brazilian aerospace outsourcing advantages. In my opinion, these can be confidently extrapolated to the rest of Latin America. As mentioned before, please move Brazil to the right of the matrix with the emerging economies, and then you have a clear competitive outsourcing growth and excellence picture for the Latin American region.

The outsourcing basis apply well for the region given its low jet-lag, North-South within 10 hours flight time, well developed air-ground-sea logistics, this is nothing new and makes a lot of sense when comparing the East-West alternatives to work with our friends the Dragons, Tigers and Bears.

#### RESOURCE BOX

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Oscar Garcia is the founding partner, Chairman and CEO of InterFlight Global Corporation (IFG), which he started in 1992. InterFlight Consulting (IFC) is a wholly owned subsidiary of IFG, formed in 2002. In addition, he is a senior consultant, board advisor and project manager in the areas of strategy, finance, sales and operations, with experience in setting up and expanding production, design and sales networks for aircraft, aerospace components and avionics in Europe and the Americas.

Oscar holds a Bachelor's Degree in Aviation Science and Technology from the Thomas Edison State College with an Aerospace Engineering specialization from San Diego State University, as well as a Masters Degree in Aviation and Aerospace Business Administration (MBA) from Embry-Riddle Aeronautical University. He holds FAA/JAR Airline Transport Pilot and Flight Instructor licenses as well as Instrument and Multi-Engine certificates with a total flight time of over 8,500 hours in a variety of aircraft and flight simulators.

Oscar serves on the Space Florida Board Advisory Committee and the Embry-Riddle Aeronautical University Business School Industrial Advisory Board. He is the immediate past President and Chairman of the Aerospace Committee of the prestigious Greater Miami Aviation Association (GMAA). Through IFC, Oscar is also a shareholder and former Managing Partner of aircraft lessor Ocean Blue Management, LLC and former President of an FAA 135 airline named Seaplanes of Key West, Inc. Oscar is affiliated with and an active participant in ICAO, IATA and other aerospace trade organizations with global reach.

## Building blocks

Criteria for building full value chain of commercial-aerospace industry<sup>1</sup>

Meets given criterion

● Yes   ● No   ● No, + key bottleneck

Criteria for success	Comments	Historical (over past 30 years)				Emerging challengers		
		EU	Brazil	Canada	Japan	China	Russia	India
Government stewardship of aerospace industry	Considered a national priority backed by credible plan	●	●	●	●	●	●	●
	Overarching governance of aerospace sector	●	●	●	●	●	●	●
Access to capital <sup>2</sup>	Government shares development risk	●	●	●	●	●	●	●
	Business partners share investment	●	●	●	●	●	●	●
	Private investment in local aerospace industry	●	●	●	●	●	●	●
Design capabilities	Fully developed program-management skills as evidenced by full-scale program involving global partners within last 10 years	●	●	●	●	●	●	●
	Proven core engineering	●	●	●	●	●	●	●
	Secondary engineering capabilities or access to them through partnerships	●	●	●	●	●	●	●
Manufacturing capabilities	Local aerospace-manufacturing base or access to global one	●	●	●	●	●	●	●
	Proven ability to integrate and undertake final assembly (1 significant jet aircraft assembled locally in past 5–10 years)	●	●	●	●	●	●	●
Product and demand	Local state-controlled market (orders coming from state-owned airlines) for first 50+ units (approximately covering development costs)	●	●	●	●	●	●	●
	Product with global appeal	●	●	●	●	●	●	●

<sup>1</sup>Based on analysis of aerospace development standards, EU: Airbus created by British, French, German consortium;

Brazil: Embraer after 1994 (privatization, 2nd expansion phase); Canada: Bombardier after 1986 (privatization of Canadair, steady growth); Japan: prior to 2003 (and before launch of Mitsubishi Regional Jet project, which aims to sell first plane in 2012).

<sup>2</sup>Average development costs for regional jet = ~\$1 billion; for single-aisle aircraft = ~\$6 billion.

--We are coming now to a final, yet, very interesting insight in terms of aerospace outsourcing rules of the game, which I call the need for “aerospace cultural affinity”. Aerospace’s commerce chain is possibly on of the most demanding in terms of in person-on the floor creative collaboration, rigor, documentation and quality control and discipline.

These outsourcing traits hinge highly on crystal clear written and oral communications, sense of right-wrong and mature creativity at all levels of production, design and engineering. This cultural affinity element, is one of the keys for program success, as we know, the smaller vendors’ errors have a large multiplier effect through the supply chain as per the fasteners 787 supply chain

earlier example.

For illustration purposes and my personal experience, let’s say that a factory worker in Mexico’s Bombardier’s assembly plant for the all new Lear 85 all composite aircraft, detects a simple, yet effective angle change in a tool that could improve on the process whilst not affecting the quality control and standard operating protocols. Would he be able, motivated and capable of telling his supervisor maybe two levels up in the organizational ladder? and who is older and more experienced. Would the supervisor be losing face in front of headquarters if his young employee shows him a way to do things better?

Moreover, would the supervisor accept the suggestion, mention where it came from and clearly communicate

in aerospace English upstream to headquarters in Canada?, and would headquarters accept the feedback and make all the changes required to make this change a new standard quickly and effectively?

The answer is yes, as more and more the aerospace “cultural affinity” in Latin America is getting closer and closer to their counterparts in North America and Europe. Would the same be true for, let’s say a Russian aircraft OEM and its outsourced factory in India or China, the answer here is a hesitant maybe.

The aerospace commerce chain is known for its intense need for crystal clear communications between designers, engineers, and design-manufacturing integrators...and did we mention the

need for intellectual property protection.

For anybody following the aerospace industry, the Embraer-Harbin factory near fiasco a couple of months ago coupled with the surprised announcement of AVIC-Bombardier cooperation, is a tale in cultural, should we say “disconnect” where it concerns intellectual property and commercial ethics and legal

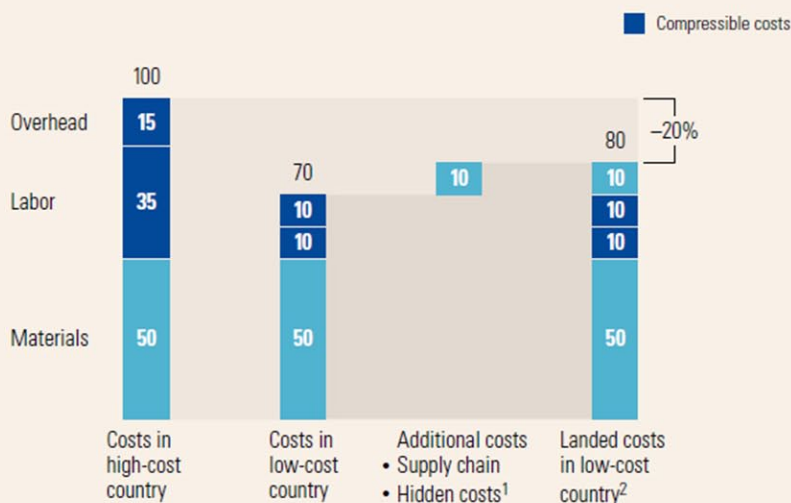
interpretations, but I am digressing.

It is well known in aerospace circles, that the cost advantages of aerospace outsourcing to emerging countries have a 10% “hidden” buffer to account for these intangibles; cultural, yet subtly powerful supply chain cultural traits. It is my educated opinion, that Latin American aerospace outsourcing takes no more than

5% of that buffer, whilst some of the other emerging powers, such as those using symbols rather than words (yes, I have seen interesting Chinese symbol laden aircraft performance, engineering charts and graphs!) might well exceed the 10% buffer and take a bite of the already tight 15-20% gross cost advantage outsourcing margins.

## Lowering costs

Aircraft structure manufacturing example; index: 100 = current costs in high-cost country



<sup>1</sup>Management complexity, risk, supply chain complexity.

<sup>2</sup>Landed costs include inbound transportation costs—eg, duties, taxes.

It should be clear by now that I am bullish in the aerospace outsourcing capabilities of most Latin American countries, and perhaps the best example to support the closing of my case is Mexico. In less than two decades, this country has become a true aerospace outsourcing powerhouse, climbing through commerce chain supplier tiers at a phenomenal speed, partly fueled by the NAFTA dynamics and partly by the know-how and the aforementioned workforce “aerospace cultural affinity” to the industry and its production processes. The Queretaro cluster is worth a detailed outsourcing model review, and the new clusters in Chihuahua and Monterey are starting to emerge as champions.

The bottom line is that a half dozen

outsourcing start ups are landing every year in Mexico. Clients are not only the usual OEM suspects to the North, but Western European gorillas such as EADS, BAE. One would think that as new Russian, Chinese and Japanese entrants are coming to the market, Mexico could be an outsourcing mature and yet low cost option for them.

The Mexican wave is now moving south to Central America, where the recently formed Central American Aerospace Association (ACAE) is beginning to harness the couple of hundred plus aerospace companies in the CAFTA-DR countries, and also benefitting from its neighbors’ successes; the already mentioned Mexican cluster success as well as Panama’s sea and air logistics

passengers and cargo hub.

It also helps that foreign direct investment to Latin America is growing as fast or faster than to Asia and last year hover around 225 US\$ billion.

Last but not least Embraer’s most recent program, the KC-390 tactical military airlifter has launched with an unprecedented cadre of program risk partners, and outsourced work from neighboring countries such as Chile, Argentina, Colombia. I suspect this could be the beginning of something bigger in the North to South aerospace outsourcing axis.

In closing, may I also say that the International Civil Aviation Organization’s official top two languages are English and Spanish? ■