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Introduction to the Republic of Colombia's C4I and Telecommunications Industry



Nowadays, managing telecommunications is an essential security role for every government. The aforementioned fact creates a new environment in which innovative tactical communication systems or novel ways of deploying or using existing tactical communication systems are needed. Therefore, communications in modern processes, computers are also a key component, for

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command, control and communication purposes. This has created a rather challenging industrial domain in which a variety of companies are cooperating, in order to create related innovative turn-key solutions.

The Colombian industry has demonstrated the existence of substantial capabilities in order to tackle the aforementioned challenges. It is indicative that a variety of new and innovative products/applications and services in this direction have been or are currently being developed by a number of Colombian companies. For example DITELCOM LTDA. is currently developing a Digital Trunk Radio System. The main characteristic of this system is that all available radio channels are dynamically "pooled" so that all radio user groups have access to all available channels. The radio user simply calls a group of radios and the Trunk System automatically assigns any free channel on which the conversation can take place. When the conversation ends, the channel is released for other users.

Additionally, CANTTEL LTDA. is currently working on potential applications of RFID (Radio Frequency Identification) systems and equipment and they also continue to invest in high capacity wireless transmission applications. On the other hand, the company SEGURIDAD ELECTRONICA Y TELECOMUNICACIONES (AREA SEGURA) is currently working on introducing a new technology for the improvement of GPS and GPRS applications for asset tracking.

Further, SEQUOIA SPACE is the only company in Colombia and Latin America dedicated to developing, producing and commercializing technology for space missions, involving small satellites. Currently, the company is working for a related mission of the space programme of Peru and three different ones for the space programme of Colombia. Additionally, very recently SEQUOIA SPACE provided an integrated telecommunications platform comprising of a UHF-VHF transceiver, a complete kit of solar panels, a set of antennas, a passive Attitude and Control System, and an antenna-deployable system for a satellite launched into orbit by the US space agency NASA.

Moreover, several Colombian companies, such as CV COMUNICACIONES S.A.S. have formed strategic alliances with international entities and as a consequence now offer their advanced products to the national market.

Epicos has identified during the mapping process of the Colombian Industry, 29 entities currently active in the C4I and Communications industry. Most of these companies are

located in Bogota, specifically 18 to be precise; Medellin follows with 7, Barranquilla with 2 and finally Cali and Cartagena with one 1 company each.



Companies Providing Services/Products to the C⁴I and Communications Industry

Below a detailed list of Colombian companies identified by Epicos during the mapping process as active in the C4I and Communications industry is provided:

- 1. ADEP & CIA LTDA (AUTOMATIZACION DE PROCESOS)
- 2. AVIATEL LTDA.
- 3. B&G ELECTRONICS LTDA.
- 4. CANTTEL LTDA.
- 5. CENTRO DE ELECTRONICA Y TECNOLOGIA INTEGRADA (CETI)
- 6. CINTEL: CENTRO DE INVESTIGACION DE LAS TELECOMUNICACIONES
- 7. CV COMUNICACIONES S.A.S.
- 8. DAGA S.A. (GRUPO DAGA)
- 9. DIELCOM LTDA
- 10. DITELCOM LTDA.
- 11. ELECTRONICA MARITIMA ITEC
- 12. EPIC LTD.
- 13. EPM TELECOMUNICACIONES
- 14. EVOTEC S.A.S.
- 15. EXCELEC S.A.S.

- 16. GEOTECH S.A.
- 17. HELIOS TECHNOLOGY & INNOVATION S.A.S.
- 18. INGENIERIA ELECTRONICA APLICADA Y CIA LTDA (I.E.A.)
- 19. OVO TECHNOLOGIES S.A.S.
- 20. RADIOCOM S.A.
- 21. RAPIDEXXUS S.A.
- 22. RMI TECNOLOGIA AERONAUTICA S.A.S.
- 23. SECURITY & CONSULTING LTDA
- 24. SEQUOIA SPACE
- 25. SOCOTEL LTDA.
- 26. SOLUCIONES MECATRONICAS BERACA
- 27. SUDAMIN AERONAUTICA Y DEFENSA S.A.
- 28. TECH DESK LTDA.
- 29. VOXTIP

In following, four (4) interviews from a selection of Colombian C4I and Telecommunications companies can be found. These interviews offer insight to only a small sample of the wide ranging capabilities of the Colombian companies active in the C4I and Telecommunications industry.

Interview with Mr. Elkin Cifuentes, General Manager of SEQUOIA SPACE





Mr. Elkin Cifuentes, General Manager of the Company SEQUOIA SPACE gave an exclusive interview to Epicos, regarding the position of the company in the international and national markets. Among others he stated that: "SEQUOIA SPACE designs and manufactures UHF-VHF

Transceivers, Passive Attitude Systems, Solar Panels, Antennas and Deployment Systems, but overall SEQUOIA SPACE focuses in offering complete mission services to its customers, including the conception of the mission, training, subsystems manufacture, ground station establishment, launch brokering, technical and administrative advice".

1. Could you please describe the current position of SEQUOIA SPACE in the national and international market?

SEQUOIA SPACE is the only company in Colombia and Latin America dedicated to developing, producing and commercializing technology for space missions, involving small satellites. We share our market with some few other companies in the world, most of them originating in the Unites States, Europe and Asia.

2. Could you please describe briefly the history of the company?

SEQUOIA SPACE was legally established in October, 2007. It was founded by Ivan Luna and Elkin Cifuentes after the first Colombian satellite, Libertad I, was put in orbit (project in which Ivan Luna was the technical director). But it was not until 2009 when Andres Alfonso (who was also part of mission Libertad I) and Carlos Suarez became partners of the company, that SEQUOIA SPACE made its first sale of parts and services for projects related to small-satellite missions. In 2010, SEQUOIA SPACE made its first sale of a complete



mission package, including training and consulting services, a ground station, hardware and software. Even though SEQUOIA SPACE is a hundred-per-cent Colombian Company, its first sales were made to Ecuador, Peru and Chile. It was not until 2011 (two years after its first sale) that SEQUOIA SPACE was able to sell parts and services in Colombia.

Nowadays, SEQUOIA SPACE is working on a mission for the space programme of Peru and three different missions for that of the space programme of Colombia, two of them in collaboration with the academic sector and the third in collaboration with the defence sector.

3. Could you please name the main customers of SEQUOIA SPACE?

Right now SEQUOIA SPACE's main customers are universities, including the Universidad Alas Peruanas in Peru and Universidad Sergio Arboleda in Colombia, as also National Defence and Governmental institutions in Latin America.

4. What are the main products that SEQUOIA SPACE is manufacturing?

SEQUOIA SPACE designs and manufactures UHF-VHF Transceivers, Passive Attitude Systems, Solar Panels, Antennas and Deployment Systems, but overall SEQUOIA SPACE focuses on offering complete mission 'packages' for its customers which include the conception of the mission, training, subsystems manufacture, ground station establishment, launch brokering, technical and administrative advice, etc.

5. What are the main technological advantages of the company's products?

The main technological advantages of our products are:

- Compatibility with industry standards.
- Robust and redundant architectures.
- Flexible technology that allows short deliverable times.

However, one of the main advantages of the company's products is related to the fact that SEQUOIA SPACE offers complete mission packages to its customers. That way its clients do not have to worry about sourcing the various components/solutions from many different suppliers. In addition to that, SEQUOIA SPACE's clients obtain insight into how a space mission is developed and are supported along the whole mission with any technical and administrative issues (having in mind that in Latin America there are no formalised space programs or related legislation).



6. Is the company currently investing in a new technology?

SEQUOIA SPACE is investing in developing commercial imaging solutions for Nano Satellites, which are not present in the market today.

7. What are the next steps and priorities of SEQUOIA SPACE?

The main priorities of the company at present have as follows:

- a. Establishing testing facilities.
- b. Establishing in house PCB manufacturing capacity.
- c. Consolidating 80% of the Latin American market.
- 8. Is there a specific country or region that SEQUOIA SPACE is planning to expand to?

The company is focussed on the continent of Latin America for the short to medium term horizon.

For further information contact:

Elkin Cifuentes General Manager & CEO Cel: + 57 - 310 562 73 23 Tel: + 57 - 1 235 82 20 E-mail: <u>elkincifuentes@sequoiaspace.com</u> www.sequoiaspace.com Interview with Mrs. Ingreed Lorena Guzman, Commercial Manager of DITELCOM LTDA.





Mrs. Ingreed Lorena Guzman, Commercial Manager of the company DITELCOM LTDA. gave an exclusive interview to Epicos, regarding the position of the company in the international and national markets. Among others she stated that: "If you need to communicate radio to radio over

greater distances, we can recommend, supply and install repeater base stations that will greatly improve the distance over which your radios can communicate. Repeater base radios are "boosters" that are installed centrally and as high as possible within your communication area".

1. Could you please describe the current position of DITELCOM LTDA in the national and international market?

We currently offer our products, services and support to a wide variety of clients in the north coast. More specifically we work with all contractors and sub-contractors of the company CERREJÓN (Guajira). On the east coast among others we work with the company Equion, a subsidiary of the British Petroleum (BP) company, which are using a system called MTP1327 RADIO COMMUNICATION developed by TAIT. Additionally we represent in Colombia the products of the company TAIT ELECTRONICS from New Zealand.

2. Could you please briefly describe the history of the company?

DITELCOM LTDA, was created in 1996 in Bogota, Colombia. The name of the company is an acronym deriving from the spectrum of our work, i.e. Design (DI) and Engineering Solutions (TELCOM) for radio communications. In particular, we specialize in two-way radio communications.

3. Could you please name the main customers of DITELCOM LTDA.?

Currently the company maintains a broad supplier base in order for the customers to be able to select the optimum solution for their particular needs. Our main customers today are:

- CERREJON,
- EQUION (BP),
- CONSORCIO URIOBRAS,
- ANDITEL,
- CRUZ ROJA.

4. Could you please describe the main services and products the company provides?

We have the experience and expertise to provide our customers with wide area radio systems, trunking systems, P25, professional hand portable radios communicating back-to-back typically within a range of about 3-5 kms, depending on terrain and local buildings.



If you need to communicate radio to radio over greater distances than this, we can recommend, supply and install repeater base stations that will greatly improve the distance over which your radios will communicate. Repeater base radios are "boosters" that are installed centrally and as high as possible within your communication area. The repeater with its associated antenna receives the transmissions from your mobile or portable radio equipment and rebroadcasts your signal to other radio users in your system. Engineering your radio system in this manner significantly increases your radio coverage and enables radio penetration into areas that may suffer from poor reception when working without a repeater.

5. Is the company currently investing in a new technology?

Yes, we are currently developing a Digital Trunk Radio System. The main characteristic of this system is that all available radio channels are dynamically "pooled" so that all radio user groups have access to all available channels. The radio user simply calls a group of radios and the Trunk System automatically assigns any free channel on which the conversation can take place. When the conversation ends, the channel is released for other users.



New Voice Over IP (VoIP) technology offers "two-way radio users options" that until recently, were very difficult to engineer and therefore often the cost prohibited the end users from acquiring such solutions.

DITELCOM constantly participates in supplier training, seminars and programs to maintain an up-to-date understanding of related products and market trends.

6. What are the next steps and priorities of DITELCOM LTDA.?

We are currently trying to change all analogue trunk radio systems that our customers operate, to digital radio systems.

7. Is there a specific country or region DITELCOM LTDA. is planning to expand to in the near future?

We have as a first priority to offer our services and products to Colombia. Any further business outside Colombia would of course be very welcome and most particularly arising from the Latin American continent.

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Interview with Mr. Carlos Velez Alvarez, General Manager of CV COMUNICACIONES S.A.S.





Mr. Carlos Velez Alvarez, Commercial Manager of the company CV COMUNICACIONES S.A.S. gave an exclusive interview to Epicos, regarding the position of the company in the international and national markets. Among others he stated that: "CV

COMUNICACIONES S.A.S.'s portfolio of services includes service provision in the area of Telecommunications, namely, design, implementation, training, auditing and maintenance on Telecommunications infrastructure and supply of equipment and materials for structured and electrical cabling, connectivity, routing, LAN and WAN Wireless networks, Windows operating licenses, CCTV, basic telephony and IP videoconferencing systems".

1. Could you please describe the current position of CV COMUNICACIONES S.A.S. in the national and international market?

CV COMUNICACIONES S.A.S. is a Small and Medium Enterprise (SME) with local presence in the city of Medellin and many other cities in Colombia. This is achieved through the formation of strategic alliances with other companies of the sector.

2. Could you please briefly describe the history of the company?

CV COMUNICACIONES S.A.S. was established in 2001, when after operating independently for some time, I decided to form and register the Company in the Chamber of Commerce of Medellin. In 2006 the premises where CV COMUNICACIONES S.A.S. is currently operating from were acquired.

3. Could you please name the main customers of CV COMUNICACIONES S.A.S.?

CV COMUNICACIONES S.A.S., due to its niche business operations is working with customers from several sectors such as the industrial, governmental, educational and health.



4. Could you please describe the main services and products the company provides?

CV COMUNICACIONES S.A.S.'s portfolio includes service provision in the area of Telecommunications, namely, the design, implementation, training, auditing and maintenance of Telecommunications infrastructure and the supply of equipment and materials for structured and electrical cabling, connectivity, routing, LAN and WAN Wireless networks, Windows operating licenses, CCTV, basic telephony and IP videoconferencing systems.

By using our certification processes we managed to become a distributor of widely recognized brands. Therefore we can provide our customers with warranties from the original manufacturer.

5. Is the company currently investing in a new technology?

CV COMUNICACIONES S.A.S. employs a highly experienced group of engineers and technicians trained in new technologies, ensuring that clients receive high quality services in an efficient, timely and cost-effective manner.

6. What are the next steps and priorities of CV COMUNICACIONES S.A.S.?

The company's priority is to constantly renew/extend our current certifications and expand our portfolio of products and clientele.

7. Is there a specific country or region CV COMUNICACIONES S.A.S. is planning to expand to in the near future?

CV COMUNICACIONES S.A.S. maintains a slow but stable pace of growth with the motto of being a technology integrator that delivers high quality technology solutions.

For further information contact:

Carlos Velez Alvarez General Manager CV COMUNICACIONES S.A.S. Tel: +57 4 436 5560 Cel: +57 - 3155892224 E-mail: carlos.velez@cv-comunicaciones.com http://www.cv-comunicaciones.com/ Interview with Mr. Manuel Adarve Patiño, General Manager of CANTTEL LTDA.





Mr. Manuel Adarve Patiño, General Manager of the Company CANTTEL LTDA. gave an exclusive interview to Epicos, regarding the position of the company in the international and national

markets. Among others he stated that: "Currently, we are working on potential applications of RFID (Radio Frequency Identification) systems and equipment and we continue to invest in high capacity wireless transmission applications".

1. Could you please describe the current position of CANTTEL LTDA. in the national and international market?

CANTTEL LTDA. is currently in the process of establishing itself in the international market. Regarding the place of the company in the national market, in Colombia there are many companies that engage in this type of business, however CANTTEL LTDA. has begun to establish itself as a recognizable entity in the region/country.

2. Could you please briefly describe the history of the company?

Before the introduction of digital technologies in telecommunications, such services were provided in Colombia by the state-owned company Telecom. This changed with the emergence of ICT (Information and Communications Technology) that enabled more focus on companies and specific regions. Then, the appropriate environment for a private initiative had been created. As a result, a group of officials from TELECOM found the opportunity to create a more 'flexible' company that provides more personalized and innovative services, facilitated by new technologies.



In March 1998 the Company Antioqueña Technology and Telecommunications (CANTTEL) was funded, initially providing installation and consulting services. In 2005, we started to develop a wireless network in the city of Medellin and its surroundings, so as to offer LAN to LAN connection to customer companies, having offices in more than one location. After that we focused on advising and implementing IP (Internet Protocol) telephony technologies.

3. Could you please name the main customers of CANTTEL LTDA.?

Our main customers today are:

• International Sanitas - Colsanitas

- National University of Colombia (Universidad Nacional de Colombia)
- COMMERCE MEDIA (Telecommunications Company)
- EDATEL
- CCC CONSORTIUM ITUANGO
- 4. Could you please describe the main services and products the company provides?

The main products/services offered by CANTTEL LTDA. at present are:

- Telecommunication services
- LAN to LAN Wireless Solutions
- Enterprise Telephony Solutions
- Wi-Fi systems for large external and internal areas
- Video Systems

5. Is the company currently investing in a new technology?

Since our goal is to provide sophisticated technologies, we are always ready to acknowledge and develop them when the opportunity arises. Currently, we are working on potential applications of RFID (Radio Frequency Identification) systems and equipment and we continue to invest in high capacity wireless transmission applications.

6. What are the next steps and priorities of CANTTEL LTDA.?

At present we are interested in providing communication services that accommodate daily tasks in rural areas and later into expanding these services to the rest of South America. These services will aim to provide tools that increase production quality and quantity, identify markets, manage available resources and possibly facilitate resource sharing among the inhabitants at a regional and institutional level. To that end we are closely collaborating with state institutions, such as Sena and Internexa.

7. Is there a specific country or region CANTTEL LTDA. is planning to expand to in the near future?

Yes we are currently trying to expand to Peru. Actually, we have already visited the country and held related business development meetings.

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Epicos Newsroom



Apart from the section focused on Colombia's C4I and Telecommunications Industry, EPICOS' newsletter also provides a section with top international news supplied by worldwide acknowledged news' providers. Through this section EPICOS announces the latest industrial developments for a large variety of high technology industries in the form of articles, videos, press-releases, electronic newspapers, etc.

Sequoia Space Provides Components for a US Space Agency Satellite

Sequoia Space is the first Colombian company to manufacture more than 50% of components for a satellite launched into orbit by the US Space Agency "NASA". According to Mr. Elkin Cifuentes, General Manager of the Company the story started in 2010 when Sequoia Space was contacted by a university in Peru, the Universidad Alas Peruanas -UAP-informing them that they were interested in developing an aerospace mission using nano-satellites. Based on their experience, Sequoia Space offered the Peruvian University training in development of nano-satellite missions, parts for the corresponding satellite, ground station, and all related services to this kind of missions (launch brokering, expedition of licenses, etc.). In such way the company's engineers trained a team at the UAP in order to help them understand how a satellite mission works and to give them the appropriate tools so that they could start approaching the development of parts and software.

Additionally, Sequoia Space developed and produced some specific parts for the flight model: a UHF-VHF transceiver, a complete kit of solar panels, a set of antennas, a passive Attitude & Control System, and an antenna-deployable system. Furthermore, also provided UAP with some parts from companies from which they resell its products to the Latin America region.

Finally after the delivery of all parts, Sequoia Space trained the UAP team on the satellite integration process, which the UAP performed by themselves, as well as the development of the control and data handling software for the mission.

Undoubtedly, this development can be fairly characterized as a "milestone" for the rise of the technological competence of the Colombian Space Industry. Not only because it means that for the first time in history parts developed by a Colombian company "travel" in space, but also because this fact allows a Colombian company to certify flight heritage in its products. This will increase the market's confidence and thus increase future sales.

Sequoia Space has also provided some parts for other institutions in Chile and Ecuador. Additionally, the company is involved in a Colombian mission, where they have been working in the production of the FACSAT-1, the first satellite from the Colombian Air Force - FAC-, and Libertad-2, the second satellite from Universidad Sergio Arboleda.

The FACSAT-1 project can be fairly characterized as interesting and important for the Republic of Colombia as allows the government and the private industry to work together in order to reach common goals. Through this project the Colombian government is investing in acquiring knowledge (know-how) by the development of a new technology instead of buying it without any real return.

Finally, it is worth mentioning that Sequoia Space is also cooperating with Universidad Sergio Arboleda and Universidad Distrital in the Republic of Colombia. They provided both universities with some parts and in the case of Universidad Sergio Arboleda, helped them train a team for the mission.

Source: Epicos, Sequoia Space

Tactical Communications Group and Interoperability Systems International Announce Memorandum of Understanding to Offer Expanded Set of TDL Solutions

ATHENS, Greece, February 18, 2014 - Tactical Communications Group (TCG) and Interoperability Systems International S.A. (ISI), today announced a Memorandum of Understanding (MoU) concerning their intended cooperation towards providing joint solutions to their world-wide customers. As tactical data links (TDL) proliferate around the world, requirements for interoperability between legacy data links (such as Link 11, Link 11B etc.) and advanced protocols continue to multiply. In order to meet some of the legacy data link standards required by its international customers, TCG intends to license elements of ISI's Universal Link System (ULS) to complement TCG's Ground Tactical Data Link System (GTS[®]).

"We consider this cooperation with TCG, as the culmination of ISI's expertise and long standing history in the TDL field, as well as its conviction in building solid relationships and creating synergies with top-of-breed companies, aiming at providing complete, effective and innovative solutions to the TDL community," said Nikos Ghikas, ISI's Director of Business Development. "We look forward in extending our scope and jointly offer new innovative solutions in the future."

"We are pleased to partner with ISI to bring additional data link capabilities to our customers. We have worked closely with ISI in the past year and have enormous respect for their products and data link knowledge," said Frank Newark, TCG's Vice President of Engineering. "While our immediate collaboration is focused on the Link 11 domain, we believe that additional cooperation opportunities will present themselves as more nations develop and mature their data link infrastructures."

About ISI – A World of Interoperability

ISI was established in Greece in 1991 and since then has been providing high quality integrated systems for the domestic and international defense markets. It is engaged in the design, development, integration, installation, testing and support of Command & Control and Tactical Data Link solutions. For more information on ISI, please visit www.isihellas.com or call us at 0030 2109647756.

About TCG - Advancing Secure Communications for the Battlefield

Founded in 2001, Tactical Communications Group (TCG) is a leading independent supplier of tactical data link (TDL) software solutions for military communications systems. TCG's comprehensive portfolio of TDL testing, training, simulation and battlefield operations software solutions provides the warfighter proven multi-link communication capabilities to optimize performance and increase mission effectiveness. TCG customers include leading military organizations, systems integrators and test agencies worldwide. For more information on TCG, please visit www.g2tcg.com or call us at 978-654-4800.

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Source: Epicos, Interoperability Systems International S.A. (ISI)

Malaysia Airlines suffers fourth straight quarter loss

Struggling flag carrier Malaysia Airlines said Tuesday it recorded its fourth straight quarterly loss in the last three months of 2013 and warned of a "challenging" year ahead due to intense competition.

The airline reported a net loss of 343 million ringgit (\$104 million) for the quarter ending December 31, compared to a 51.4 million gain in the fourth quarter in 2012, it said.

For the full year, it chalked up 1.17 billion ringgit in losses, almost three times as much as in 2012, when it lost 433 million ringgit amid an aggressive cost-cutting campaign.

It said the 2013 fourth quarter losses were due to the ringgit depreciating, unrealised foreign exchange losses and finance costs.

"Intensified competition" also hurt the carrier with revenue for the quarter inching up less than one percent to 3.9 billion ringgit.

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"Going into 2014, Malaysia Airlines expects the business environment to remain challenging with high fuel prices, volatile foreign exchange and intense competition impacting yield from both existing as well as new entrants into the market," it said in a filing to the stock exchange.

For the full year 2013, the airlines' revenue was 15.1 billion ringgit, up 10 percent from 2012 as the number of passengers rose almost 30 percent.

But expenditure also increased 10 percent to 14.9 billion ringgit year-on-year amid high fuel prices.

"Within this growing market place, Malaysia Airlines had to expand capacity in order to remain relevant as a key player", said Malaysia Airlines Group Chief Executive Officer Ahmad Jauhari Yahya.

"The full year performance of making a bigger loss in 2013 compared to 2012 demonstrates the challenges brought on by intensifying competition leading to lower yields for all players."

Analysts have blamed a combination of stiff competition, poor management, changeresistant unions and government interference for the carrier's poor performance.

In 2012, the carrier admitted it was in "crisis", forcing it to implement a cost-cutting campaign centred on slashing routes and other measures.

In 2011, it chalked up a record 2.5 billion ringgit loss.

Source: 2014 AFP, Agence France-Presse (AFP)

Emerging Asian carriers make presence felt with plane deals

Emerging Asian carriers made their presence felt at a major airshow Thursday with multibillion-dollar deals that underscored the region's importance as the growth driver of global aviation.

Four relatively small Asian carriers already had a combined order book of more than \$11 billion halfway into the six-day Singapore Airshow, with smaller planes as their preference.

Airline executives said many smaller cities in Asia remain underserved despite the explosive growth in budget air travel, and they will use the new planes to connect such destinations to metropolitan centres.

Asia's expanding middle class is driving demand, said Song Seng Wun, regional economist with Malaysian bank CIMB.

"It's really a function of regional economies experiencing spending power of the rising middle class which benefited from so many years of steady growth," Song told AFP.

In the latest deal, Indian carrier Air Costa on Thursday ordered 50 E-Jets E2 aircraft, which can seat 70-130 passengers, from Brazilian manufacturer Embraer worth \$2.94 billion.

The deal with Air Costa, which began operations only four months ago, also includes purchase rights for 50 more of the aircraft, both companies announced at the show.

With the orders, Air Costa will become the first customer of the E-Jet E2 in the Indian market when it takes delivery of the first plane in 2018.

Thai budget carrier Nok Air also on Thursday firmed up orders for two Q400 86-seater planes from Canada's Bombardier worth \$63 million.

Nok Air indicated it may buy six more depending on its needs.

The Singapore Airshow began Tuesday with an order by Vietnamese budget carrier VietJetAir for 63 Airbus A320 jets worth \$6.4 billion.

The deal also covered rights to acquire or lease 38 more A320s, potentially boosting VietJetAir's current fleet of 11 A320s tenfold.

The Vietnamese airline, founded only in 2011, plies domestic routes as well as services to Bangkok, Seoul and Kunming in China with its current fleet of leased planes.

In another deal, US aicraft maker Boeing on Wednesday announced that Nok Air had committed to buy 15 B737s worth \$1.45 billion.

Bangkok Airways, which brands itself as a "boutique carrier" that flies to selected tourist destinations, on Wednesday also signed up to buy six 72-600s from European plane-maker ATR in a deal worth \$150 million.

Air Costa executives said they would use the E-Jets E2 aircraft from Embraer to serve smaller Indian cities.

"Our focus has been the tier-two and tier-three cities in India," Air Costa chief financial officer Vivek Choudhary told a media briefing Thursday.

"Our philosophy is that we believe that 70 percent of the population, of the huge 1.2 billion population in India, still reside in these non-metros," he added.

"Basically we are linking the metros to the smaller cities."

Choudhary said the carrier expects the air transport sector in India to grow dramatically in the next 15 to 20 years.

"The huge size of the middle class in India and the profitability levels that are going up adds to the demand in air travel," he added.

Nok Air chief executive Patee Sarasin said his airline was looking to expand into Myanmar following the opening up of the formerly army-ruled state.

"I think Myanmar has really stepped up," Patee told reporters after firming up the two jet orders with Bombardier.

"We think it's a beautiful country and we see a high potential that Myanmar will grow very fast," he said.

"I am sure within the next few years we are going to see Myanmar growing as fast as Vietnam."

Economist Song said such new markets were an "added bonus" as even without them demand for travel in Asia was robust.

"Frontier markets are an added bonus," he said. "Even without the likes of Myanmar, demand continues to grow."

Airbus, Boeing and Embraer -- in their 20-year forecasts for the industry -- all said the Asia Pacific is the key market to enter because of the burgeoning middle class.

Embraer's president and chief executive Paulo Cesar Silva said passenger traffic in the region "is mostly composed by secondary markets with low and medium demand densities of up to 300 passengers daily each way".

"Some 60 percent of those markets are not served nonstop, and around half of all markets served do not allow for same day return travel," he said.

Source: 2014 AFP, Agence France-Presse (AFP)

Taiwan, Macau sign official aviation pact

Taiwan and the semi-autonomous Chinese territory of Macau on Monday signed their first official aviation agreement in another sign of warming ties between Taipei and Beijing, officials said.

The agreement came after Taiwan and China last week held the first government-togovernment talks since their split 65 years ago.

"The signing of the new aviation agreement is conducive to the further improvement of substantial ties between Taiwan and Macau," Taiwan's Mainland Affairs Council, which handles China policy, said in a statement.

The agreement will allow more airlines from both sides to fly the route to and from Macau, a major gambling resort.

Currently, Air Macau operates 35 flights weekly while Taiwan's EVA Airways provides 40 flights and TransAsia Airways 35 flights per week under an agreement signed in 2001 between Air Macau and the aviation transportation association in Taipei.

The average occupancy of the three airlines on the route was around 71 percent in the past three years, according to Taiwan's Civil Aeronautics Administration.

Taiwan upgraded its representative offices in Macau and Hong Kong in 2011, and both Macau and Hong Kong separately opened a liaison office in Taipei in 2012.

Tensions with the mainland have eased markedly since the China-friendly Kuomintang government of Ma Ying-jeou came to power in 2008 on promises of strengthening trade links and allowing in more Chinese tourists. He was re-elected in January 2012.

But China still considers Taiwan part of its territory awaiting reunification -- by force if necessary.

Source: 2014 AFP, Agence France-Presse (AFP)