

Reese Hollister
rwhollis@ncsu.edu
North Carolina State University
<https://orcid.org/0009-0009-8961-4618>

From Colonies to Carriers: A History of Postcolonial African Airlines

Abstract

This paper examines why and how independent Morocco rapidly developed Royal Air Maroc one year after decolonization, and whether Morocco's experience was typical among newly independent African states. The first section narrates RAM's early success, highlighting professional training programs as its key advantage. The second section situates RAM within broader African trends, outlining the challenges states faced in building national airlines. Drawing on Ben Guttery's *Encyclopedia of African Airlines* (1998), which covers 723 airlines, this study uses data science methods, including a custom-built GPT extraction tool, to quantitatively compare airlines by ownership models, colonial histories, and settler status. Unlike previous studies that reduce African aviation to economic analysis, this project combines historical context with quantitative evidence, bridging a major historiographical gap.

The findings show that state-owned and joint-venture airlines consistently outperformed private carriers in fleet size, employee count, and longevity. Airlines in former French colonies outperformed those in former British colonies across all success measures. While settler colonies developed airlines earlier, settler status had little impact on long-term success. By placing Royal Air Maroc within these broader patterns, this study shows that early postcolonial airline success relied on state investment, professional training, and international collaboration.

Keywords: Royal Air Maroc; African aviation; decolonization; postcolonial economic development; digital history

Introduction

On June 28, 1957, following Morocco's independence in 1956, the colonial airline of *Compagnie Chérifienne de Transport Aériens Air Atlas* (Air Atlas) was combined with Air Maroc and then reorganized into *Compagnie Nationale Royal Air Maroc*. Before independence, Air Atlas and Air Maroc primarily served European settlers and colonial administrators, but its reorganization into Royal Air Maroc (RAM) marked a crucial shift toward national ownership and accessibility for Moroccan citizens. This air carrier went under joint ownership from the Moroccan government (55%), Air France (30%), Société Air Transport (10%), and the Spanish airline Aviaco (5%).¹ In addition to carrying pilgrims to Mecca, services later connected Morocco to Europe in the 1960s, and by 1975, Royal Air Maroc became the first Arab air carrier to begin service across the Atlantic to New York City.² This route continued as RAM continued expanding.



¹ Ben R. Guttery, *Encyclopedia of African Airlines* (Jefferson, NC: McFarland, 1998), 128.

² Guttery, *Encyclopedia of African Airlines*, 128.

Figure 1: Pilgrims Traveling via RAM to Mecca, 1964.

Source: Royal Air Maroc. "Moroccan Airline: The Story of Royal Air Maroc." 1964. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives.

Today, Royal Air Maroc serves 46 countries and 94 destinations with 52 aircraft. In 2024, it carried over 7.5 million passengers, generating a revenue of 19.86 billion Moroccan Dirhams, about 1.9 billion USD.³ These statistics highlight Morocco's success in establishing a national airline industry, but this outcome was not inevitable. The rapid development of Royal Air Maroc, just one year after decolonization, raises important historical questions about postcolonial economic strategies in Africa. So, why and how did independent Morocco quickly develop their national airline, Royal Air Maroc, one year after decolonization, and to what extent is Morocco's case typical or unique in comparison to other newly independent African states?

To test Royal Air Maroc's typicality or uniqueness, this research paper takes a quantitative approach towards economic history using data science and data visualization. Rather than relying on GDP metrics to measure growth, this study examines the relationships between historical factors related to decolonization and successful airline outcomes to assess the role of aviation in early postcolonial development. Centering aviation tells a richer historical story than other markers of economic success due to the fact that airlines are tangible and have significant impacts on development. Aviation is not only for transporting people, resources, and finished goods, but it also aids in aerial photography, mapping, mail delivery, crop-dusting, and connecting difficult to access regions and people to the rest of the country.⁴ Governments across Africa invested in aviation as a symbol of modernization, but their success varied widely. In 1961, the largest airline in an independent African country carried merely 200,000 passengers in

³ Royal Air Maroc Targets 7.5 Million Passengers in 2024 with Strategic Growth Plan," *7news Morocco (blog)*, October 23, 2024, <https://en.7news.ma/royal-air-maroc-targets-7-5-million-passengers-in-2024-with-strategic-growth-plan/>.

⁴ "Air Maroc (Morocco), Undated," *Special Collections and Archives*, University of Texas at Dallas. Accessed January 4, 2025. https://libarchives.utdallas.edu/repositories/2/archival_objects/58035.

a year, inconsequential in comparison to the world's airlines totalling over 100 million passengers.⁵ This statistic does not mean that African airlines are negligible and insignificant to historians, for peoples' mobility increased: "Travel to places in Europe that were only names to most Africans a few years ago, as well as places behind the Iron Curtain, have become commonplace."⁶ Aviation had the potential to connect an independent Africa to the world.

The greater historiographical puzzle that I seek to pose an answer to remains: why did some African states find success rapidly building their economies at a time when they rejected colonizers that played a double role of financiers? How gradual was this process? There was no single economic trajectory for newly independent African states, and many states faltered. Previous research on African airlines and decolonization tends to take a purely economic and industrial approach, generally lacking in historical context, leading to insufficiently evidenced historical claims.⁷ This research bridges this gap by first telling the story of Royal Air Maroc using primary source documents and placing the company in a greater African context. The second half of this study uses data-driven analysis to determine whether Royal Air Maroc's trajectory was unique or reflected broader patterns in African postcolonial aviation.

Rather than treating airlines as mere symbols of modernization, I argue that their success or failure reveals deeper insights into the economic and infrastructural strategies of newly independent African states. This study ultimately contributes to historiographical debates on postcolonial economic strategies, illustrating how newly independent African nations navigated the challenges of self-sufficiency, modernization, and international integration in the absence of their former colonial financiers.

⁵ Duncan Cumming, "Aviation in Africa," *African Affairs* 61, no. 242 (1962): 29–39.

⁶ Cumming, "Aviation in Africa," 36.

⁷ Kenneth Button, Gianmaria Martini, and Davide Scotti. "African Decolonisation and Air Transportation." *Journal of Transport Economics and Policy* 49, no. 4 (2015): 626–39, 638.

Literature Review

Historians have paid surprisingly little attention to African airlines and their relationship with decolonization. Instead, scholars of other disciplines attempted to fill in the gap left by a lack of history written by historians. This body of literature foregoes investigating change over time; rather, these scholars take an approach reflective of the fields of economics, international relations, business, and industry. The result is a body of literature that is spilling over with valuable historical data, but it leaves little room for historical interpretation.

Research on international aviation from international relations scholars like Christer Jönsson help us understand how all international airlines rely on deep interdependence and cooperation between states and other non-state actors.⁸ The development of international aviation has significantly contributed to global interdependence; however, it was not always this way. The early period of civil aviation from 1919 until 1944 followed norms of “unrestricted sovereignty,” where state governments were the principal actors.⁹ Jönsson identified a change after World War Two when the number of international airlines multiplied, so airlines other than national carriers gradually depended less on their governments for financial support.¹⁰ For airlines to operate internationally, interdependence had to increase, so international organizations like the African Civil Aviation Commission (AFCAC) replaced earlier tendencies towards bilateral agreements.¹¹ Overall, this article uses airlines to make a greater point about Liberal Institutionalism in international relations and greater interdependence in the post-war period, but this article does not address any colonial factors related to how aviation spread globally.

⁸ Christer Jönsson, “Sphere of Flying: The Politics of International Aviation,” *International Organization* 35, no. 2 (1981): 273-302.

⁹ Jönsson, “Sphere of Flying,” 276, 278.

¹⁰ Jönsson, “Sphere of Flying,” 283, 285.

¹¹ Jönsson, “Sphere of Flying,” 284, 282.

Ben R. Guttery's *Encyclopedia of African Airlines* from 1998 is by far the most comprehensive collection of data related to the topic.¹² While it does not provide much interpretation about historical factors that led to change in African aviation over time, Guttery's *Encyclopedia* entries are as numerous as they are detailed. There is critical information for each entry, including airline start and end years, fleet size and composition, employee count, flight types, ownership structure, flight operations, and documented accidents, among other miscellaneous information. Not all information is readily available for each airline, causing some limitations for this project, and this will be discussed further in the *Methodology and Data Science* section of this essay.

The massive source base for this encyclopedia's 723 entries sits at the *The Ben Guttery Collection on African Airlines*, held at the University of Texas at Dallas. According to the collection guide, "this collection contains correspondence, articles, research materials, photographs, postcards, notes, manuscripts, bibliographies, and indices that Ben Guttery created and/or collected."¹³ Many of the research materials come from aviation industry literature that showcases companies' various achievements, whether they were technological developments, the acquisition of certain equipment, the establishment of new routes, or something else.

In this project, aviation industry literature must not play the role of a secondary source, but they do provide useful facts and information related to a variety of firms in the industry. A 2012 self-report titled "Boeing in Africa" can serve as an example of a firm's own teleology, where progress and expansion become teloi.¹⁴ This report showcases Boeing's vast reaches into

¹² Ben R. Guttery, *Encyclopedia of African Airlines* (Jefferson, NC: McFarland, 1998).

¹³ Ben Guttery Collection on African Airlines, History of Aviation Archives, Special Collections and Archives Division, Eugene McDermott Library, University of Texas at Dallas. Accessed January 4, 2025. <https://libarchives.utdallas.edu/repositories/2/resources/317>.

¹⁴ Eszter Ungar, "Boeing in Africa," October 29, 2012, <https://web.archive.org/web/20121029154045/http://www.boeing.com/aboutus/international/docs/backgrounders/afri cabackgrounder.pdf>.

African countries, airspaces, and markets. Boeing also proclaims its goodness here: “Everywhere in the world where it does business, Boeing provides human and financial resources to strengthen local communities, working with in-country partners through the company’s Global Corporate Citizenship (GCC) organization.”¹⁵ It continues to list its contributions to The African Medical and Research Foundation, Engineers without Borders (EWB), Kenya’s Village Enterprise Fund, and Kenya’s Women’s Microfinance Initiative.¹⁶ Because Boeing, or any other firm for that matter, writes to promote its successes and drive investment, historians must read this industry literature with its obvious biases in mind.

Many pieces of literature coming from outside the discipline of history often make historical claims while gravely oversimplifying complex historical legacies. The article “African Decolonisation and Air Transportation” asks an excellent historical question: what is the impact of colonial history on contemporary economic linkages (specifically air transport) in Africa? The conclusion that they come to is as follows:

[B]eing a former French colony seems to be more useful than being a British one when it comes to intra-block flights, and as a result running counter to much of the related work in the field. It may be that while the free trade ethos of the British Empire was an advantage to ex-colonies after independence, and the tendency for the French Empire to channel its trade through France a disadvantage for French colonies, as many have suggested, this has been outweighed by other factors.¹⁷

Unfortunately, there are severe data limitations in their methodology, for they solely rely on scheduled seat supply as the dependent variable due to the absence of data on actual passenger traffic or fares.¹⁸ Moreover, they use dummy variables based on official language retention to the former colonial status of African countries. The authors also assumed a continuity between the economic models of Africa's newly independent states and the colonial legacies from only two

¹⁵ Ungar, “Boeing in Africa,” 4.

¹⁶ Ungar, “Boeing in Africa,” 4-5.

¹⁷ Button, Martini, and Scotti, “African Decolonisation and Air Transportation,” 638.

¹⁸ Button, Martini, and Scotti, “African Decolonisation and Air Transportation,” 633.

colonial powers: “These [British] colonies thus had a long history of free trade, while France enforced mercantilism and protectionism throughout the colonial period.”¹⁹ These oversimplifications simply snowball into an insufficiently evidenced argument, so their original historical question remains unanswered.

Case Study: Royal Air Maroc

Royal Air Maroc was the result of a merger that could have only happened through decolonization, and it required deep collaboration between an independent Morocco and a detached France. Two companies, Air Atlas and Air Maroc, seemed destined to merge in 1953 under the name *Compagnie Cherifienne de Transports Aeriens Air Atlas* (Air Atlas), which became *Compagnie Nationale Royal Air Maroc* (RAM) four years later in 1957.²⁰ Through state participation, Royal Air Maroc became the “flag carrier” of the newly independent Kingdom of Morocco. RAM immediately became a symbol of national independence. On the business side, it suffered no financial losses between 1956 and 1961.²¹ Royal Air Maroc’s financial success was possible precisely because it was not the first attempt at civil aviation in the country. Its establishment was dependent on the existence of previous aviation infrastructure from the French Protectorate. In its early years, RAM succeeded financially because it invested in specialized training with state involvement. National prestige and independence became the marker of Royal Air Maroc’s success, but the reality was more complicated. Despite projecting an image of national independence, RAM’s survival was contingent on a mixed economic model backed by French capital.

¹⁹ Button, Martini, and Scotti, “African Decolonisation and Air Transportation,” 629.

²⁰ Royal Air Maroc, *Moroccan Airline: The Story of Royal Air Maroc* (1964), Ben Guttery Collection on African Airlines, Special Collections and Archives Division, History of Aviation Archives.

²¹ Royal Air Maroc, *Moroccan Airline: The Story of Royal Air Maroc*, 1.

Aviation in Morocco started during the French Protectorate period, this period's title signifying that France would control Morocco's foreign policy, military, and jurisdiction, while the Sultan remained as a symbolic figurehead. With the 1912 Treaty of Fes, the Resident General of France in Morocco became Louis-Hubert Lyautey, who controlled the French Protectorate in Morocco until 1925. The Resident-General title signified that France did not see Morocco as a colony, "rather, it was to remain sovereign but 'protected' until that undefined moment when, in [Lyautey's] own words, it would be 'developed, civilized, living its own autonomous life, detached from the metropole.'"²² This period lasted until Moroccan Independence in 1956, and it saw the advent of French civil aviation, blossoming in Morocco for the first time.

French civil aviation began in the September of 1919 when French industrialist Pierre Latecoere founded *Lignes Aeriennes Latecoere*.²³ This company started the first regular airmail service between Toulouse and Rabat via Barcelona and Alicante. The company expanded to Casablanca, Agadir, and Dakar by June 1925. The French colonial airline industry in Morocco seemed to lull during the interwar period and World War Two, but the industry expanded when Air Atlas came into being in October 1946. Also after the war, in June 1946, Air France reopened its long multi-part route to Brazil via Rabat and Casablanca.²⁴ When Air Atlas ran into financial difficulties in 1948, Air France gave financial and material support through capital reorganization. By the final years of the French Protectorate, Air Atlas operated a vast domestic network, connecting the cities of Rabat, Meknes, Fez, Oujda, Tangier, Casablanca, Marrakech and Agadir together, transporting about 50,000 passengers.²⁵ Around the same time, in 1947,

²² D. Rivet, *Le Maghreb à l'épreuve de la colonisation* (Paris: Hachette, 2002), 216, quoted in Susan G. Miller, *A History of Modern Morocco* (Cambridge: Cambridge University Press, 2013), 90.

²³ Royal Air Maroc, *Moroccan Airline: The Story of Royal Air Maroc*, 2.

²⁴ Royal Air Maroc, *Moroccan Airline: The Story of Royal Air Maroc*, 3.

²⁵ Royal Air Maroc, *Moroccan Airline: The Story of Royal Air Maroc*, 3.

French private interests formed Air Maroc as a charter or non-scheduled operator. After independence in 1956, the Moroccan government sought to merge Air Atlas and Air Maroc.

The result of this merger was *Compagnie Nationale Royal Air Maroc*, and the government gave RAM exclusive rights for operation of Moroccan air transport, both domestic and international. Initially in 1957, the Moroccan government owned 55.0% of RAM, but this number increased to 68.9% ownership by 1966. In those same years, Air France's ownership decreased from 30.0% to 17.5%.²⁶ By 1990, the government owned 93.0% of the company's shares.²⁷ While RAM initially signified a public-private partnership that tied Moroccan state-enterprise to private French interests, the ownership distribution changed. These changes signify Morocco's increasing yet gradual independence from French capital over time.

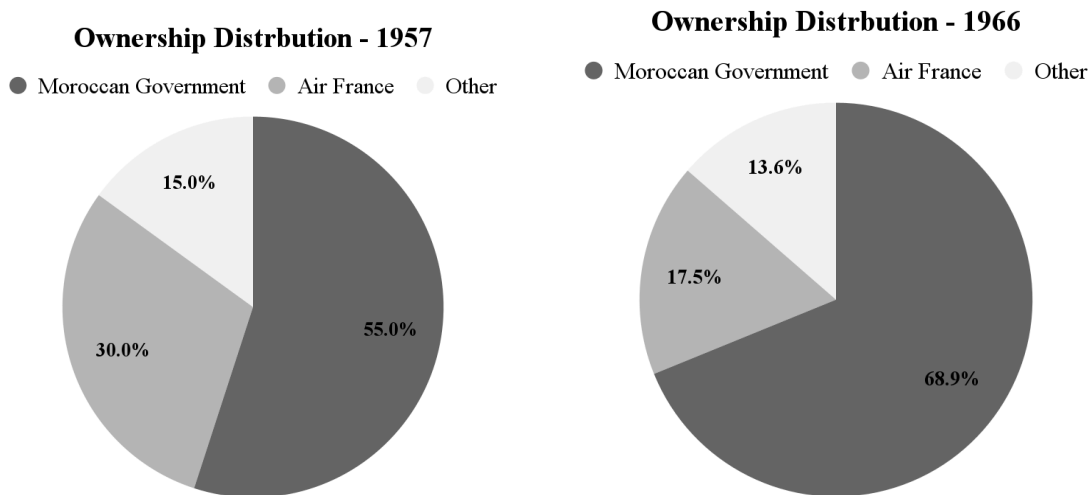


Figure 2: Royal Air Maroc Ownership Distribution (1957 and 1966).

Source: Royal Air Maroc. "Moroccan Airline: The Story of Royal Air Maroc." 1964. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives.

²⁶ Royal Air Maroc, *Moroccan Airline: The Story of Royal Air Maroc*, 3.

²⁷ Royal Air Maroc, "Royal Air Maroc (Advertisement)," 1990, Ben Guttery Collection on African Airlines, Special Collections and Archives Division, History of Aviation Archives.

Royal Air Maroc became significantly more successful as a business over time. Off to a strong start, RAM suffered from no financial losses in its first five years after independence.²⁸ There are many ways to measure RAM's success. Figure 3 below shows Royal Air Maroc's number of passengers per year, and company growth by this metric was exponential. More passengers demanded more employees, so their numbers also increased. In 1960, RAM employed 565 people, "including 95 flight personnel (25 pilots, 16 radio navigators, 17 flight mechanics, 23 hostesses, and 14 stewards)."²⁹ By 1964, that number increased to 762 employees, just to rise to 815 within two more years.³⁰ Of those employees, 559 were Moroccan. The quantitative evidence of RAM's growth in its first decade is overwhelming and clear, but it does not explain the company's immaterial and symbolic successes, nor does it provide reasons as to why Royal Air Maroc made this growth possible.

Number of Passengers per Year (Royal Air Maroc, 1955 - 1976)

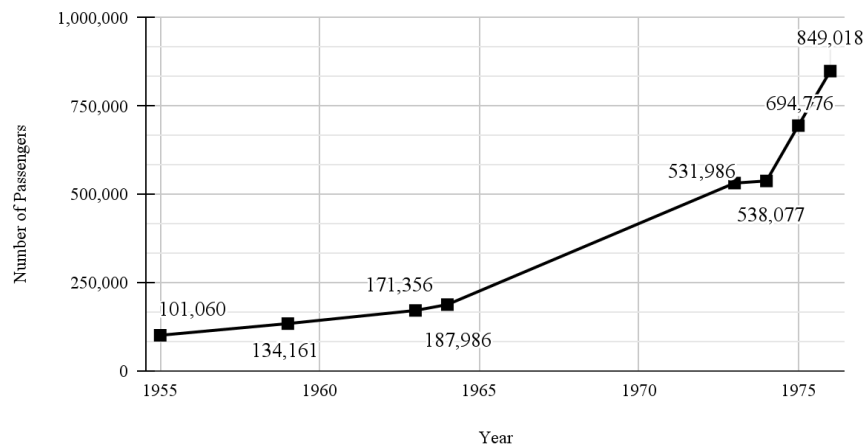


Figure 3: Number of Passengers per Year (Royal Air Maroc, 1955-1976).

Source: Royal Air Maroc. "Moroccan Airline: The Story of Royal Air Maroc." 1964. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives.

²⁸ Royal Air Maroc. "Moroccan Airline: The Story of Royal Air Maroc," 1.

²⁹ Jacques Noetinger, "Royal Air Maroc: Une Compagnie Dynamique," *Aviation: magazine de l'espace*, December 1, 1960, Musée Air France num en l'état.

³⁰ World Bank. *The Economic Development of Morocco; a Report of a Mission Organized by the International Bank for Reconstruction and Development at the Request of the Government of Morocco* (Baltimore: Johns Hopkins Press, 1966): 11. ; Royal Air Maroc. "Moroccan Airline: The Story of Royal Air Maroc," 3.

Royal Air Maroc was also a symbolic success, as marketing and industry literature demonstrated the ways in which it represented the Moroccan nation-state. It was on a mission to establish its image, especially in the lucrative American market.” Peter Tallon called RAM a “pacemaker in African transport” after seeing how “much emphasis [has been] placed on cabin service and a complete and demanding training programme has been introduced to make the standards of in-flight service second to none; for instance, hot meals will be served on all flights in economy class.”³¹ Royal Air Maroc represented Morocco to both Moroccans and foreigners, and the planes themselves were designed to provide a unique;y Moroccan experience. Even the logo signifies Morocco: the crown and “Royal” name emphasizes the monarchy, while the five pointed star matches the Moroccan flag in its representation of the five pillars of Islam. The wings are obvious, while the Arabic script shows the nation-state’s Arab-dominant identity. The planes themselves displayed all of these symbols on the runways and in the skies.



³¹ Peter Tallon, “Royal Air Maroc: Pacemaker in African Transport,” *Interavia* (1978), Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives.

Figure 4: Royal Air Maroc Morocco Travel Poster, 1970.

Source: *Royal Air Maroc Travel Poster*. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives. Accessed via Internet Archive, <http://archive.org/details/morocco-royal-air-maroc-travel-poster>.

Figure 5: Royal Air Maroc Montreal Travel Poster, 1970.

Source: *Royal Air Maroc Travel Poster*. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives. Accessed via Internet Archive, <http://archive.org/details/montreal-ram-royal-air-maroc-travel-poster>.

Royal Air Maroc's marketing department also created a plethora of advertisements to promote their destinations, both domestic and international. Similar to RAM's ability to display their national colors on the runway and in the sky, advertising allowed RAM to represent both their company and the Moroccan nation-state. In Christer Jönsson's words, "Since international aviation provides ample opportunities to 'show the flag' around the world, it has from the outset been viewed as enhancing the prestige of states. Air transport also facilitated propaganda and cultural penetration abroad."³² Royal Air Maroc allowed Moroccan national identity and national pride to extend far beyond borders, and far reaching the company was.

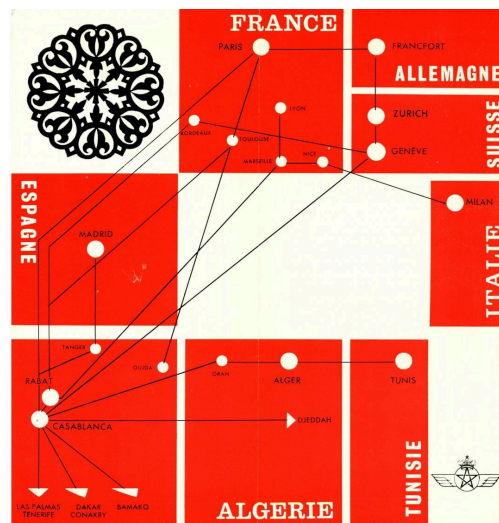


Figure 6: Royal Air Maroc Timetable, 1966.

Source: *George M. Foster Timetable Collection*, TL024, Northwestern University Transportation Library. https://findingaids.library.northwestern.edu/repositories/5/archival_objects/468017.

³² Jönsson, "Sphere of Flying: The Politics of International Aviation," 279.

Royal Air Maroc served a wide variety of destinations from the beginning. By 1960, RAM served nine cities in Morocco, six in France, three in Spain, two in Algeria, and others in Germany, Switzerland, and Senegal.³³ By 1990, RAM served 61 destinations in over 31 countries: “North and Equatorial Africa, Montreal, New York and Rio de Janeiro; most major European and Middle East cities connect with major Moroccan destinations.”³⁴ RAM even handled taking pilgrims to Mecca all the way on the Arabian Peninsula. The timetable above is from 1966, and it showcases all of the destinations that could connect through Morocco. Its art style is distinctly modern. This timetable uses bold shapes and a limited color palette; its design is sleek, clean, and efficient. Its distinctly modern style would have projected an image of efficiency and progress that consumers would associate not only with RAM, but also the country itself.



Figure 7: Royal Air Maroc Stewardesses, 1964.

Source: Royal Air Maroc. "Moroccan Airline: The Story of Royal Air Maroc." 1964. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives.

³³ Noetinger, “Royal Air Maroc: Une Compagnie Dynamique,” 3.

³⁴ Royal Air Maroc. “Royal Air Maroc (Advertisement).” *Unknown*, 1990. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives. https://libarchives.utdallas.edu/repositories/2/archival_objects/58039.

Modernization was an explicit and continued priority for Royal Air Maroc because modern equipment and conveniences showcased Morocco's technological prowess and prestige. By 1964, RAM reported on how it was "modernizing" its fleet, purchasing three Caravelle 3 Jetliners and four Lockheed Constellation 749s from Air France, replacing the unpressurized Douglas DC-4's that were on previous international routes.³⁵ Writing for *Interavia* in 1978, that sam Peter Tallon extolled RAM's "management that has clearly defined its objectives and purchased the right equipment to do the job," calling this one of the main reasons for the company's success.³⁶ In an advertisement from 1990, RAM flexed its fleet that by that time was almost entirely from Boeing, the American airplane manufacturer.³⁷ All of these advertisements further highlight Royal Air Maroc's successes in both branding and marketing.

So, what were the reasons for Royal Air Maroc's success? Above all other reasons is RAM's investment in state of the art training for its entire professional staff. In 1958, RAM built *Le Centre de Formation Professionnelle*, which trained "airframe and engine mechanics, electricians, radio operators and mechanics, commercial and traffic agents, air hostesses and stewards."³⁸ They modeled this training center on that of French aviation schools, with classrooms, laboratories, and specialty workshops next to the main hangar at the Casablanca-Anfa airport. The trainees, according to reporter Jacques Noetinger, learned "their trade and are ready not only to take their place within the airline but also to become technicians useful to the Moroccan nation."³⁹ The training center also hosted those from outside the Moroccan nation, including personnel from Tunisair and electrical and radio trainees from the

³⁵ Royal Air Maroc. "Moroccan Airline: The Story of Royal Air Maroc," 1.

³⁶ Peter Tallon, "Royal Air Maroc: Pacemaker in African Transport." *Interavia*, 1978. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives.

³⁷ Royal Air Maroc. "Royal Air Maroc (Advertisement)."

³⁸ Royal Air Maroc, "Moroccan Airline: The Story of Royal Air Maroc," 4.

³⁹ Jacques Noetinger, "Royal Air Maroc: Une Compagnie Dynamique," *Aviation: magazine de l'espace*, December 1, 1960. Musée Air France num en l'état.

Mali Civil Aviation Administration.⁴⁰ In 1977, 22 out of the 350 students were foreign to Morocco, since this was one of only two such centers in the whole of Africa (the other was in Dakar). According to Peter Tallon's reports, the presence of foreign students showed "the extent to which Third World airlines are dependent on outside help, and obviously RAM realizes that training programs for other countries would be a significant source of income as well as being a feather of prestige in its cap."⁴¹ The training center was the number one reason for RAM's success, professionalism, and prestige.

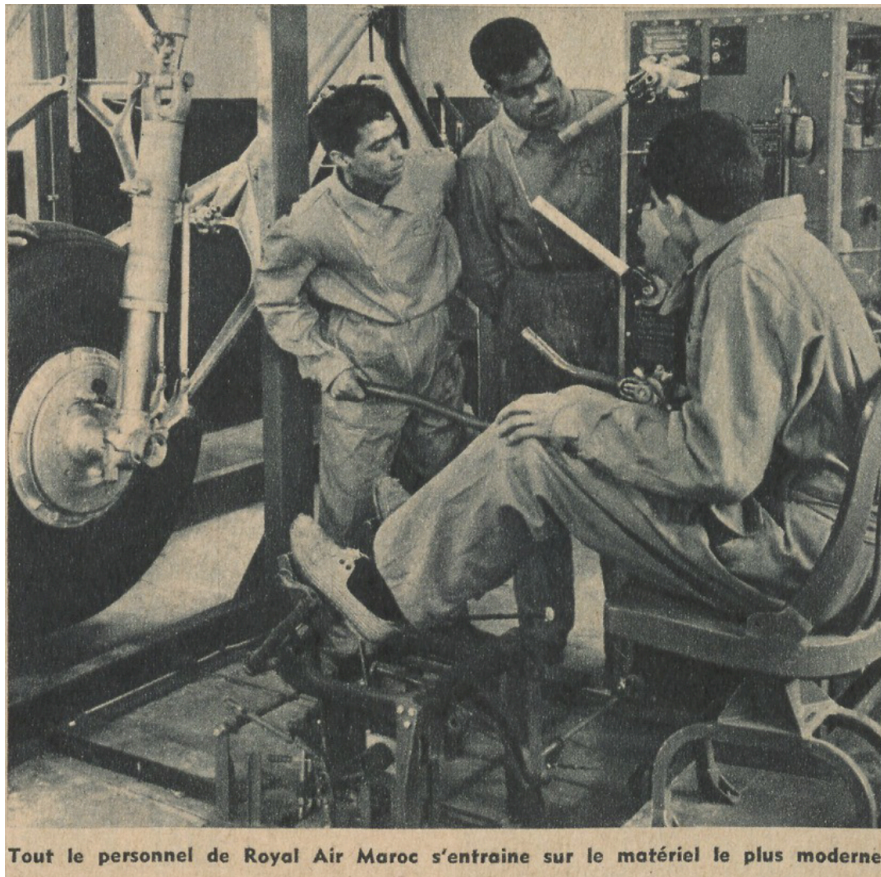


Figure 8: Royal Air Maroc Training Center, 1964.

Source: Peter Tallon, "Royal Air Maroc: Pacemaker in African Transport," Interavia, 1978. Ben Guttery Collection on African Airlines. Special Collections and Archives Division, History of Aviation Archives.

⁴⁰ Royal Air Maroc, "Moroccan Airline: The Story of Royal Air Maroc," 4.

⁴¹ Tallon, "Royal Air Maroc: Pacemaker in African Transport," 2.

Professional training reveals that RAM's success was also built on interdependence that aided Morocco in becoming more independent. First, the training center was supported by the International Civil Aviation Organization (ICAO), showing Moroccan airlines' connections with larger international systems.⁴² To facilitate this transition, RAM took recommendations from international organizations. A 1966 World Bank report on Morocco's economic development recommended investing in specialized labor from abroad:

When foreign capital is involved, much of the necessary high-level management and service staff will undoubtedly be imported from abroad. To meet international standards, key personnel throughout the tourist industry should be obtained abroad as an interim measure until the augmented training programs which we recommend begin producing Moroccan staff in adequate numbers.⁴³

This recommendation matched reality. RAM undertook the entire training scheme in 1964 in an agreement with the French government at the *École Nationale d'Aviation Civile* at Saint-Yan and Orly.⁴⁴ Following the global oil crisis of the early 1970s, RAM's training center became severely taxed in its resources, so nearly half of the company's flight deck personnel were still foreign.⁴⁵ *Le Centre de Formation Professionnelle* began training pilots in 1970, and the airline's President/Director General Driss made expanding the training center his explicit priority.⁴⁶

Royal Air Maroc was successful because it worked towards self-sufficiency since its inception. In other places, "reliance on Western skilled labour has considerably hampered technical progress and has also been a drain on currency."⁴⁷ In Morocco, however, the professional training center and pilot school received FAA accreditation in 1983, "testifying an equivalent standard to the USA," the company flexed in its advertising.⁴⁸ The school's fleet had

⁴² World Bank, *The Economic Development of Morocco*, 11.

⁴³ World Bank, *The Economic Development of Morocco*, 3.

⁴⁴ Royal Air Maroc, "Moroccan Airline: The Story of Royal Air Maroc," 4.

⁴⁵ Tallon, "Royal Air Maroc: Pacemaker in African Transport," 1.

⁴⁶ Tallon, "Royal Air Maroc: Pacemaker in African Transport," 2.

⁴⁷ Tallon, "Royal Air Maroc: Pacemaker in African Transport," 2.

⁴⁸ Royal Air Maroc, "Royal Air Maroc (Advertisement)," 1.

twelve aircraft by the 1990s, which facilitated training for both pilots and technicians of RAM and other airlines.⁴⁹

Royal Air Maroc's success was multifaceted, blending national prestige with tangible operational achievements. RAM successfully embodied Moroccan independence in its branding, marketing, and global presence. The foundation laid by French colonial aviation infrastructure provided RAM with an initial advantage. Its historic successes are measurable through metrics like passenger growth, fleet modernization, and route expansion. Of course, Morocco relied on a mixed economic model, initially depending on French capital and expertise. However, RAM became more independent as the state invested in specialized training via *Le Centre de Formation Professionnelle*. This training center was the most critical factor for RAM's sustained success, and it involved large amounts of international collaboration. Royal Air Maroc's story demonstrates how a post-colonial national airline could navigate the complexities of inherited infrastructure and international relationships, leveraging strategic investments (especially in human capital via training) to build not just a financially viable company, but a powerful symbol of national capability and increasing independence on the world stage.

African Airlines in Context

Colonization directly caused the advent of African civil aviation, but the industry changed during the critical era of decolonization as newly independent states wanted to showcase their prestige to global audiences. Arguably more important than nationalist flexing, African states demanded airlines to fuel their economic development and gradually transition away from European capital. Independent states' governments responded by investing heavily into national airlines, sometimes experimenting with transnational African airlines. Following, a

⁴⁹ Royal Air Maroc, "Royal Air Maroc (Advertisement)," 1.

wave of neoliberal privatization occurred in later decades. This section of the paper relies on three reports by the U.S. Department of Commerce's Business and Defense Services Administration in 1960, ICAO (International Civil Aviation Organization) in 1964, and Douglas Aircraft Company's Market Research Division in 1978. All three reports agreed that the largest challenge that African airline development faced was the need for well trained personnel, "Africanizing" the industry. Africanization was an explicit priority for all newly independent African states, every single one of them developing national airlines that, for the most part, continue today.

The Need for Air Transport in Africa

Independent African economies largely demanded air transportation to fuel growth and become more independent from not only their former colonizers, but also their neighbors beyond updated borders. Africa is massive, and surface transportation underdeveloped by colonial powers was either inadequate or lacking all together. According to a 1978 report by Douglas Aircraft Company's Market Research Division, air transport was "indeed uniquely suited to the African situation. The frequency of great underpopulated distances between centres of production and consumption and the conditions of climate and terrain that impede the development of the surface modes present only minor difficulties for air transport."⁵⁰ Eighteen years earlier, the US Department of Commerce's Business and Defense Services Administration came to the same conclusion about surface transport, evidencing topographical barriers and wide distances between centers of population and between sources of supply and markets.⁵¹

⁵⁰ Douglas Aircraft Company, Market Research Division, *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents* (Long Beach, CA: McDonnell Douglas Corporation, November 1978), 5.

⁵¹ Business and Defense Services Administration, *World Survey of Civil Aviation, Africa* (Washington, DC: U.S. Department of Commerce, 1960), 5.

The need for air transportation in Africa was most critical during the years closest to decolonization. Sources from the time corroborated this claim: “Colony status is ending for large areas of Africa. In 1960, 16 states became independent, and they will require capital, managerial skills, and trained manpower in order to establish self-government and build balanced economies.”⁵² These critical years of decolonization were historically contingent, meaning so much could have possibly gone wrong. Newly independent nation-states had to rise to the challenge and develop their economies. Airlines were one of the many fruits of this labor, but this fruit was ripe and hard to reach.

Economic and Operational Challenges

Before getting into the many operational challenges, it is important to first note that economic development is the most major element that influences airlines’ proliferation and growth, and potentially its decay. Africa’s natural resources provided the basis for the continent’s economic growth, but growth patterns naturally diverged.⁵³ Various airline growth metrics reflect and show how different regions developed at different rates (Figures K, L, and M). All regions saw growth in the industry explode in the period following decolonization, with West Africa generally having the most airlines, flight frequencies, and seats offered in the years between 1932 and 1972.⁵⁴ Certainly decolonization was a lead cause of increased economic development.

Beyond broken terminals and poor baggage handling, airlines in Africa faced unique challenges. Keeping down costs was the largest of them all.⁵⁵ As reported by the International

⁵² Business and Defense Services Administration, *World Survey of Civil Aviation, Africa*, 5.

⁵³ Douglas Aircraft Company, Market Research Division, *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents*, 41.

⁵⁴ Douglas Aircraft Company, Market Research Division, *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents*, 41.

⁵⁵ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 39.

Civil Aviation Organization (ICAO) in 1964, the average expense per unit (tonne-kilometre) for African airlines was 30% more expensive than the world average. “Flight operations” and “maintenance and overhaul were the largest contributors to high operating expenses, a result of “the frequent necessity of employing relatively high-salaried non-African personnel for flight crew and ground duties and for maintenance operations,” among other reasons.⁵⁶ High operating costs fell onto the consumer, and fares were rarely cheap, seldom discounted, and only sometimes sufficiently subsidized.⁵⁷

The ICAO recommended greater subsidization and stronger governmental involvement in airlines because fares were simply too high. To the ICAO, subsidization had differently shaped blades to cut down on operating costs: “(A) Liberal granting of traffic rights, (B) Increased subsidization of operating expenses, (C) Encouragement of tourism, (D) Replacement of obsolescent by new aircraft, (E) Africanization of personnel and overhaul arrangements, (F) Regional and sub-regional planning and organization.”⁵⁸ Subsidies would have hopefully discounted air fares for private passenger travel both within and beyond the continent. If freight rates also went down, air transport would then further excite industrial development. To cut costs, governments and airlines had to collaborate by Africanizing the industry.

Africanization and Personnel Training

As argued in the previous case study, Royal Air Maroc succeeded because it quickly built and trained students at *Le Centre de Formation Professionnelle*. The 1964 ICAO report agreed that “inadequacy of well-qualified personnel for civil aviation is a major short-coming. (...) Modern aviation equipment cannot give continuous satisfactory service unless operated and

⁵⁶ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 25.

⁵⁷ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 9, 32.

⁵⁸ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 10.

maintained by competent personnel.”⁵⁹ This challenge was not unique to the aviation industry. Low salaries, poor employment conditions, and lack of familiarity with technological skills meant that all industries had an input problem.⁶⁰ Without proper training, the whole operation would remain inefficient and expensive.

Training was capital intensive, but some North Western African governments sought assistance from the ICAO and built training centers.⁶¹ These efforts were humble, with an annual student capacity of 285 and an average annual output of 180.⁶² The students had to be well qualified, and the well qualified had to be attracted by compensation during and after training. Based on the ICAO’s recommended growth rates for the amount of students under training, “full Africanization of aviation personnel will take some time.”⁶³ Morocco’s success in professional training was rather unique, but the demand for Africanizing skilled labor was ubiquitous.

International Cooperation and Joint Ventures

Sometimes, Africanization meant creating airline consortia and multinational airlines, especially during the 1960s. The British in 1964 formed Central African Airways Corporation (CAAC), West African Airways Corporation (WAAC) and East African Airways Corporation (EAAC). The French equivalent, Air Afrique, formed in 1961. The consortium represented 11 French-speaking African companies and partnered with French company UTA (*Union de Transports Aeriens*) for technical assistance.⁶⁴ Air Afrique’s entry (no. 234) in Ben Guttery’s

⁵⁹ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 35.

⁶⁰ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 35.

⁶¹ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 36.

⁶² International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 36.

⁶³ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 37.

⁶⁴ Douglas Aircraft Company, Market Research Division, *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents* (Long Beach, CA: McDonnell Douglas Corporation, November 1978), 14.

Encyclopedia of African Airlines is one of the lengthiest in the entire book. According to Guttery, Air Afrique was basically a pool agreement for sharing resources between various airlines:

As independence swept across Africa in the late 1950s and early 1960s the French airlines that served the West African countries were looking for ways to continue their lucrative long-haul routes between these new countries and Europe. Air France and UAT agreed to form a private company to operate domestic routes in Africa to feed their international routes and assist the new African states in forming their own airlines.⁶⁵

Increasing air frequencies within Africa made sense for all parties involved. The independent states would be able to connect deep and vast networks and further develop their domestic services. In fact, the ICAO in 1964 agreed that these regional and sub-regional services have been underdeveloped as compared to intercontinental services, especially since there appeared to be “an excessive number of airlines competing for the available traffic.”⁶⁶ France’s interests were equally simple to understand: by gradually granting independence to their former colonies, they were able to keep their own networks in-tact following the period of decolonization, at a hopefully lower cost.

Each of Air Afrique’s national shareholders (Cameroon, Central African Republic, Congo [Brazzaville], Ivory Coast, Gabon, Dahomey, Upper Volta, Mauritania, Niger, Senegal and Chad) held 6% of the company, while SODAF (*Société pour le Développement du Transport Aérien en Afrique*) held the remaining 34%.⁶⁷ They collaborated deeply. For example, Air Afrique joined the Air France computer reservation system in 1973. This reliance on French capital (or the capital of any former colonizer for that matter) and technology was in parallel with Morocco’s increasing independence in airline ownership discussed in the previous section. Air Afrique and other similar pool agreements highlight deep economic and technological ties between African

⁶⁵ Guttery, *Encyclopedia of African Airlines*, 80-81.

⁶⁶ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 6–7.

⁶⁷ Guttery, *Encyclopedia of African Airlines*, 81; International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 53.

and European states following decolonization, ties that tended “to follow lines of political association.”⁶⁸ Overall, African countries by no means gained 100% independence the day after their colonizers signed their leave; instead, these new states often maintained ties with their former colonizer, which is especially visible in aviation sectors.

African states also cooperated in many intracontinental ways without the oversight of their former colonizers. For example, the Agency for the Safety of Air Navigation in Africa and Madagascar (ASECNA; *Agence pour la Sécurité de la Navigation Aérienne*) continues to collaboratively maintain airspace, prevent accidents, and host training.⁶⁹ Similar international public institutions started in the 1960s, two more being the East African Common Services Organization (EACSO) and International Aeradio Ltd. United Kingdom.⁷⁰

Some consortia broke up around the same time as newly independent airlines, but cooperation did not stop then. The opposite became true: more airlines meant that there was an increased demand for training and education in marketing, operational, and technical discipline.⁷¹ 1968 saw the formation of AFRAA (African Airlines Association), and pool agreements continued on bilateral and multilateral bases between African countries.⁷² The general breakup of consortia from the late 1950s and early 1960s did not mean that cooperation ended. It was only the beginning, and cooperation was growing fast.

Visualizing Expansion

⁶⁸ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 41.

⁶⁹ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 41.

⁷⁰ International Civil Aviation Organization, *Air Transport in Africa: A Joint Study*, 41.

⁷¹ Douglas Aircraft Company, Market Research Division, *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents* (Long Beach, CA: McDonnell Douglas Corporation, November 1978), 14.

⁷² Douglas Aircraft Company, Market Research Division, *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents*, 14.

The vast expansion of African airlines took place over space, so these changes are intuitive for visualization. Douglas Aircraft Company's Market Research Division made an incredibly rich and detailed series of four continental maps from 1948 until 1972. The thickness of the lines in the four maps correlates to the frequency of the route. The timeline shows a shift in centers for aviation in Africa. In 1948 and during the early postwar period, Tripoli became an essential stop for almost all services that were to traverse over the Sahara.⁷³ As aircraft improved, Tripoli became less important, while South Africa remained the major destination for European travelers. By 1964, the jet age was in its early years, and range improved. As an effect of better technology and a number of new nations that required "independent and exclusive service," traffic lines dispersed, especially in West Africa. By 1972, the network gained in complexity where seemingly everywhere connected to everywhere else. South Africa no longer was the most major destination, for other countries in West, East, and Central Africa rose in both importance and airline infrastructure.

African airlines developed in a world where political independence did not guarantee economic or technological independence. While many African states worked hard to build national airlines as symbols of sovereignty and tools for economic growth, the path was rarely smooth. Heavy costs, reliance on foreign technical support, and uneven development patterns persisted long after decolonization. Yet cooperation, training, and gradual Africanization caused growth, which will be explored quantitatively in the next section.

⁷³ Douglas Aircraft Company, Market Research Division, *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents*, 24.

Typicality and Methodology⁷⁴

Putting Royal Air Maroc's story in context to assess its typicality or uniqueness requires quantitative methods because it is only one of hundreds of African airlines that operated in the twentieth century. Ben Guttery's *Encyclopedia of African Airlines* contain 723 entries representing distinct aviation companies provides an overwhelming range and depth of data, including airline start and end years, fleet size and composition, employee count, flight types, ownership structures, ranges of flight operations, and documented accidents, among other miscellaneous information. Not all information is readily available for each airline, and other information is vague, but it is by far the most comprehensive and complete data set on twentieth century African airlines.

The largest obstacle to this research became the fact that Guttery's *Encyclopedia* is only in hard copy, and I had to extract textual data from the book (written in prose) and insert it into a readable spreadsheet for further analysis. I tediously entered about 500 entries by hand, so I needed a way to automate this task. By chance, I received an exclusive offer for two months of free ChatGPT Plus, which allowed me to create a Custom GPT. An online guide for custom GPTs from MIT describes what a custom GPT does:

Custom GPTs are helpful artificial intelligence tools tailored for specific domains or contexts. These GPTs differ from standard chats through ChatGPT due to their custom instructions and ability to keep a knowledge base in addition to what ChatGPT has already been trained on. This allows users to create a custom GPT to address a specific need that might be hard for ChatGPT to achieve on its own. The process of creating a custom GPT requires no code, and instead involves

⁷⁴ I would like to acknowledge the gracious assistance from Data & Visualization Services from North Carolina State University Libraries' Data Experience Programs and Services. Mr. Ishti Sikder (Data Science Research Consultant and Ph.D. Student, Industrial and Systems Engineering) and Mr. Alp Tezbasaran (Data Science Librarian and Ph.D. Student, Nuclear Engineering) agreed to assist me with exploratory analysis and data visualization for up to one hour per week. Their consultation was invaluable when it came to exploratory data analysis and defining objectives for the project. Any requests for data sets or materials can be requested via an email to rwhollis@ncsu.edu.

using specific prompts and your own data to provide insights into a particular field.⁷⁵

I named the custom GPT “African Airlines Data Extractor,” and I trained it on a few different files and we co-constructed clear instructions for it (see Appendix A: Custom GPT Instructions). The Data Extractor’s process is visualized below, but for a more in-depth understanding of how it works, please see Appendix B: Airlines Data Extractor – User Guide.



Figure 9: Airline Data Extractor Explainer.

Source: Author-generated visualization based on custom GPT development.

⁷⁵ “Custom GPTs at MIT Sloan: A Comprehensive Guide,” MIT Sloan Educational Technology, accessed January 5, 2025, <https://mitsloanedtech.mit.edu/ai/tools/writing/custom-gpts-at-mit-sloan-a-comprehensive-guide/>.

Once the African Airlines Data Extractor outputted the TSV files, I conducted random checking both as I was compiling individual country data sets and after I compiled all country data sets into one spreadsheet. If a country's entries were deemed complete and correct, it was merged into the master data set. If they were incomplete or incorrect, then I recalibrated the system and ran the prompts again. Following, I created new charts and isolated the entries by their independent variables (e.g. former colonial power, ownership model), and I hypothesized that these independent variables could affect dependent variables (various metrics of airline outcomes).

Entry Number	Airline Name	Country	Former Colonial Power	Settler or Non-Settler Colony	Type of Decolonization	Year Founded	Year Ceased
331	Aerial Photos	Morocco	France	Settler	Negotiated	1990	1998
332	Air Atlas	Morocco	France	Settler	Negotiated	1946	1953
333	Air Maroc (1947–1953)	Morocco	France	Settler	Negotiated	1947	1953
334	Air Maroc (1953–1957)	Morocco	France	Settler	Negotiated	1953	1957
335	Air Sud	Morocco	France	Settler	Negotiated	1990	1998
336	Atlas Aviation	Morocco	France	Settler	Negotiated	1990	1998
337	Royal Air Inter	Morocco	France	Settler	Negotiated	1970	1998
338	Royal Air Maroc	Morocco	France	Settler	Negotiated	1957	1998

Airline Lifespan	Ownership Model	Government Involvement	Fleet Size	Number of Employees	Domestic Service	Regional Service	Intercontinental Service
8	Private	Low	1	5	Yes		
7	Joint Venture	Medium	21		Yes	Yes	
6	Private	Medium	15		Yes	Yes	Yes
4	Joint Venture	High	17		Yes	Yes	Yes
8	Private	Low	3	6	Yes		
8	Private	Low	1		Yes		
28	Parastatal	High	2		Yes		
41	State-Owned	High	35	5400	Yes	Yes	Yes

Figure 10: Guttery Spreadsheet Output Example.

Source: Author-generated table based on extracted airline data from Ben R. Guttery, Encyclopedia of African Airlines. Jefferson, NC: McFarland, 1998.

In the absence of economic data such as profit and revenue, I define a “successful airline” as having a long lifespan, a large fleet, and a large number of employees. These metrics on an airline's success comprise the dependent variables. For an economist, the independent variables might contain GDP growth or fuel prices. However, I am asking historical questions that are based on specific times and contexts, so the independent variables are related to the

non-numerical factors about a country’s process of decolonization and nationalization of the airline industry after independence.

Now that I have defined the independent and dependent variables, I refined my questions to be answerable through the data (see chart below). It is with these questions in mind that we move to the following section.

Question	Independent Variable	Dependent Variable(s)
Did airlines in former settler colonies have longer lifespans than those in non-settler colonies?	Type of colony (settler or non-settler)	Airline lifespan
Was there a significant difference in the average lifespan of airlines between countries that experienced negotiated decolonization and those that experienced violent decolonization?	Method of decolonization (negotiated, violent, or partial)	Airline lifespan
Which ownership model (nationalized, subsidized, private) resulted in the longest average airline lifespan?	Airline ownership model (nationalized, subsidized, or private)	Airline lifespan
Did airlines with specific ownership structures (e.g., nationalized) achieve greater fleet sizes or employee counts compared to others?	Airline ownership structure (nationalized, subsidized, or private)	Number of employees Fleet size
Which former colonial powers (e.g., Britain, France, Portugal) saw their former colonies develop the most successful airlines (based on combined metrics)?	Former colonial power (e.g., Britain, France, Portugal, etc.)	Airline “success”

Results and Data Visualization

After compiling the data from the 723 entries into one spreadsheet from the individual country spreadsheets, I separated the entries by isolating various independent variables. These variables diverge in (1) ownership models, (2) former colonial powers, and (3) status as either a

former settler or non-settler colony. The effects of these variables on airline outcomes not only reveal how independent African airlines developed on a continental level, but they also point towards changes over time regarding how this development took place.

Ownership Models

The first thing to notice about African airline development over time is the exponential growth of the total number of airlines. In Figure 11 below, the green counts airlines that started in each decade, whereas the red counts airlines that ceased in each decade. The black line represents the total number of extant airlines, which increases over time as more airlines started than ceased. By the publishing of the Guttery collection in 1998, there totaled 434 operating airlines. We can notice a few interesting developments in this chart. In the 1960s, a large number of colonial eras either ceased or were redeveloped into national airlines in independent states. Additionally, the growth of the total airlines was quite low in the 1970s, which I suppose to be an effect of the global oil crisis. Finally, the 1980s and 1990s saw a massive increase in the number of airlines, which other data visualizations prove to be the effect of privatization.

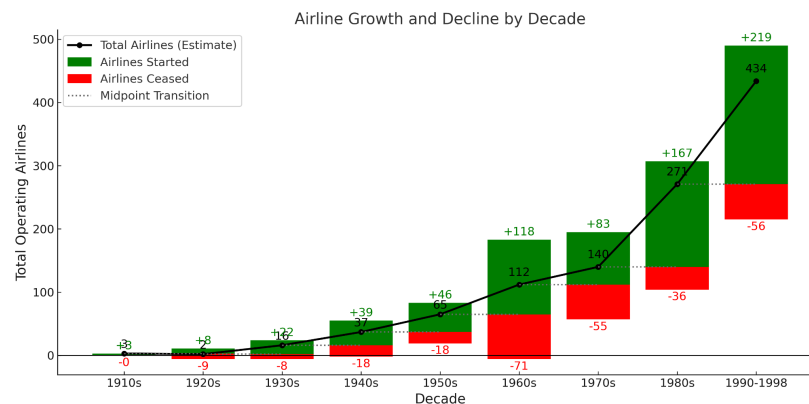


Figure 11: Airline Growth and Decline by Decade.

Source: Author-generated chart using compiled data from Ben R. Guttery, Encyclopedia of African Airlines. Jefferson, Chicago Style Figure Captions and Sources NC: McFarland, 1998.

Speaking of privatization, the vast majority of the entries in Guttery's *Encyclopedia* were private firms. The African Airlines Data Extractor classified an airline as Private if Guttery described it as a charter company, private enterprise, or if it was formed by named individuals or corporations. State-Owned airlines were the second most common of the ownership models, and they refer to entries described as national airlines, government run, or having majority public ownership. Following were Joint Ventures, which signifies that the airline was formed in collaboration between foreign and domestic partners. Finally, Parastatals were the least common ownership model, and it denoted that the airline was owned by a public agency but still retained commercial autonomy. So, how do these four models of ownership compare when it comes to successful airline outcomes?

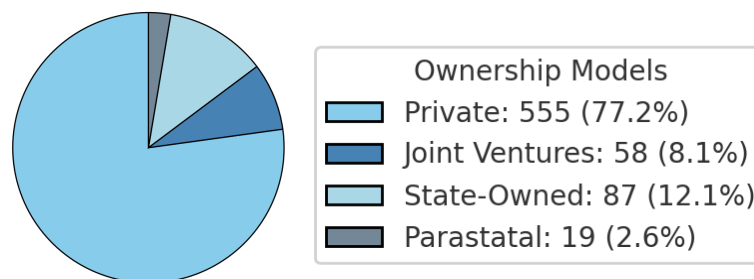


Figure 12: Ownership Models Breakdown.

Source: Author-generated chart from classification data using Ben R. Guttery, Encyclopedia of African Airlines. Jefferson, NC: McFarland, 1998.

When comparing the average fleet size and average number of employees for the four ownership models, it becomes evident that the average state-owned airline and joint venture was generally much larger than the average private and parastatal firms. The average state-owned airline had about 3.3 times the number of airplanes in its fleet at its peak than private companies. Very few private companies had large numbers of airplanes in their fleets, and the sheer quantity of small private companies certainly outnumbered these larger ones, bringing the average fleet size down. The average state-owned airline and joint venture employed a large number of airplanes,

which required a large number of employees. Larger state-owned companies and joint ventures had more equipment and personnel, so the range of services and operations reflected this.

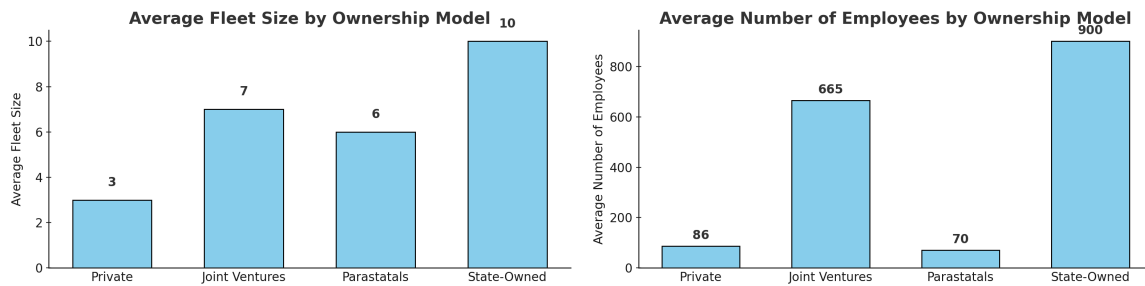


Figure 13: Ownership Models' Effects on Airline Outcomes

Source: Author-generated data visualizations from airline database extracted from Ben R. Guttery, Encyclopedia of African Airlines. Jefferson, NC: McFarland, 1998.

Domestic routes were near-universal for state-owned and parastatal carriers, but they were still fairly high for joint ventures and private airlines. However, regional coverage varied more sharply. Joint ventures like East African Airways Corporation (Entry #276) and Central African Airways (Entry #701) led the regional service category because African transnational companies started using pool-agreements to cooperate regionally. Joint ventures sometimes meant African governments worked with established European aviation companies, and the relatively high rate of intercontinental services reflects this. Parastatals and private carriers were less committed to regional feeders. No ownership model had more than 50% of airlines offering intercontinental services because long-haul service is costly.

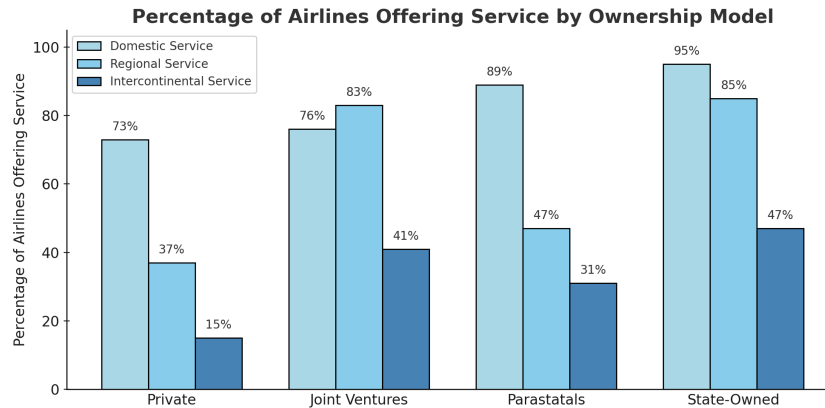


Figure 14: Percentage of Airlines Offering Service by Ownership Model.

Source: Author-generated pie chart using categorical data from Ben R. Guttery, Encyclopedia of African Airlines. Jefferson, NC: McFarland, 1998.

If we take these airlines grouped by ownership model and compare their lifespans, then an interesting story about change over time appears. The start year for each box is the average start year for airlines in each category; the same logic applies to the end year and average airline lifespan. With this in mind, we can see that each ownership model reflects a different cascade in African airline development. When European colonies in Africa became independent states in and around the 1960s, they quickly developed state-owned airlines, which generally lasted the longest out of all the ownership models. Following this first wave were the joint ventures which meant either transnational African cooperation or continued dependence on European capital, as discussed in the previous sections. These companies had relatively short lifespans because these companies generally broke up into multiple independent airlines.⁷⁶ Following, a large wave of privatization occurred across Africa in the 1980s and 1990s, drastically increasing the number of airlines. Many did not succeed based on the airlines' short average lifespan. Because of the small sample size for measuring parastatals, they are insignificant in larger airline development from independent nationalization to regional cooperation and, finally, to neoliberal privatization.

⁷⁶ Douglas Aircraft Company, Market Research Division. "Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents." Long Beach, CA: McDonnell Douglas Corporation, November 1978. Transportation Library at Northwestern University.

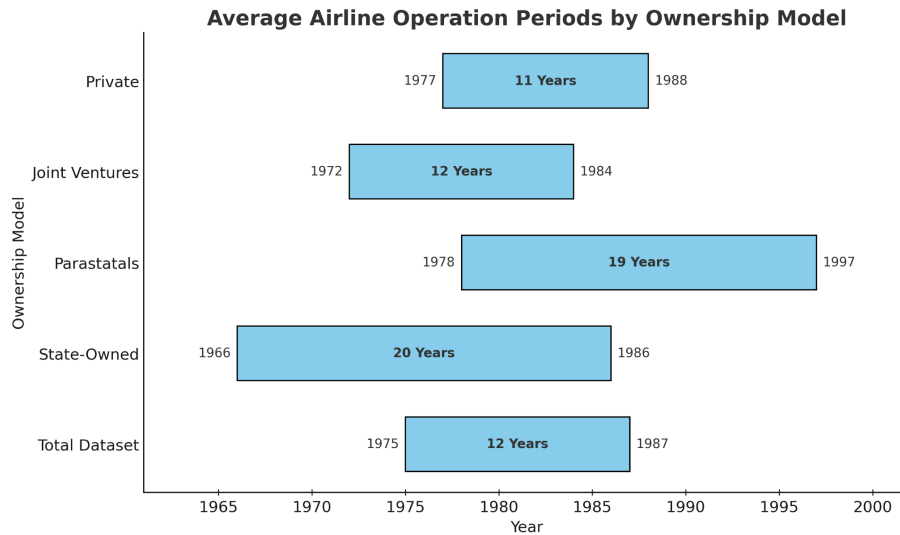


Figure 15: Average Airline Operation Periods by Ownership Model.

*Source: Author-generated pie chart using categorical data from Ben R. Guttery, *Encyclopedia of African Airlines*. Jefferson, NC: McFarland, 1998.*

In comparing African airlines by ownership models over time, a clear pattern emerges: state ownership and joint ventures became preconditions for a massive wave of privatization. State-owned companies achieved the most in all major metrics of airline success from the scale, range, and longevity of their operations. The average national airline strongly outperformed its private competition, which makes sense considering that national governments had a vested interest in ensuring their prestigious flag carriers' success.

Settler vs. Non-Settler Former Colonial Status

Many of Africa's colonies were settler colonies, whereby European colonists settled in large numbers and established hegemony that displaced and subjected existing African populations. So, to what extent did settler colonialism affect airline outcomes in independent African states? Survey says that 315 out of the 723 airlines came from countries that were formally settler colonies: Algeria, Angola, Canary Islands, Kenya, Libya, Mozambique,

Namibia, Reunion, South Africa and Zimbabwe (Rhodesia). I hypothesized that airline outcomes would be on average stronger in former settler colonies because settlers had access to large amounts of capital. Instead, this hypothesis became null because two metrics of success (fleet size and employee count) gave opposite results.

That being said, there was a substantial difference in the timelines of airline development between former settler colonies and former non-settler colonies. The average airline start date appears about eight years earlier in settler states that turned independent. The average airline lifespan is about the same, showing no causative effect of settler status on successful airline outcomes for a country. While we can not extrapolate whether independent states that were formerly either settler or non-settler colonies saw better airline outcomes, it becomes clear that

settler colonies saw earlier airline development by a considerable factor.

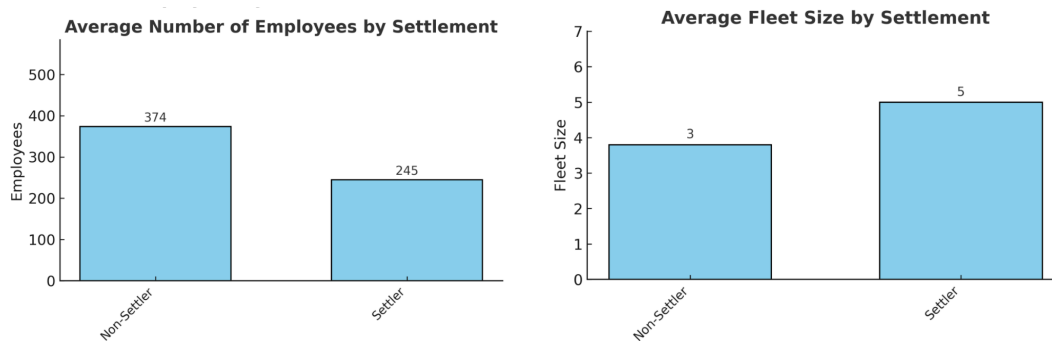


Figure 16: Average Number of Employees and Fleet Size by Settlement.

Source: Author-generated charts based on coded dataset using Ben R. Guttery, Encyclopedia of African Airlines. Jefferson, NC: McFarland, 1998.

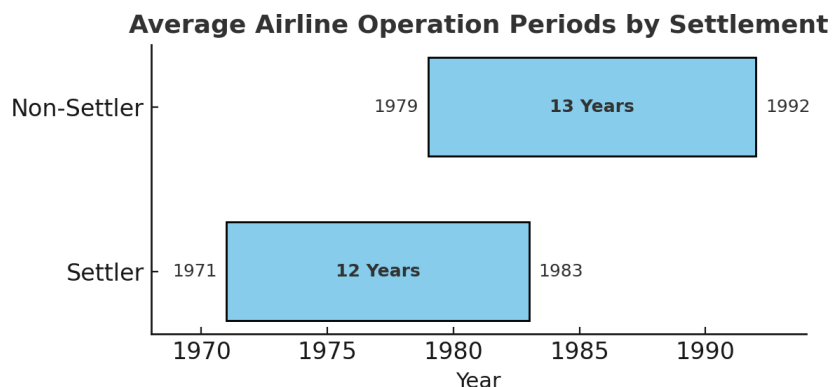


Figure 17: **Average Airline Operation Periods by Settlement.**

*Source: Author-generated chart using dataset coded for settler/non-settler status, based on Ben R. Guttery, *Encyclopedia of African Airlines*. Jefferson, NC: McFarland, 1998.*

Former Colonial Power

As mentioned in the literature review, previous research on “African Decolonisation and Air Transportation” asks great historical questions, namely: how do colonial origins influence economic outcomes in Africa? And, how can we measure these relationships? They argued that airlines in former British colonies were more successful than ones in former French colonies because “with lower taxes, there was less distortion in the British colonies, leaving a greater tradition of internal free trade. (...) These colonies thus had a long history of free trade, while France enforced mercantilism and protectionism throughout the colonial period.”⁷⁷ The researchers mistakenly assumed that newly independent African states unquestioningly continued the economic models of their former colonizers, so their independent variable falls short. Their dependent variable was the number of scheduled seats offered in only one year, 2012. They honestly describe their data issues themselves in the essay:

Data issues (...) limit the nature of the empirical analysis that can be performed; there is no information, for example, on air fares or the number of passengers that are carried. The analysis thus focuses entirely on considering factors influencing the supply of seats on each major origin-destination pair in sub-Saharan Africa.⁷⁸

⁷⁷ Kenneth Button, Gianmaria Martini, and Davide Scotti, “African Decolonisation and Air Transportation,” *Journal of Transport Economics and Policy* 49, no. 4 (2015): 629.

⁷⁸ Button, Martini, and Scotti, “African Decolonisation and Air Transportation,” 633.

Their conclusion, restated from the literature review, was as follows:

“In particular, being a former French colony seems to be more useful than being a British one when it comes to intra-block flights, and a result running counter to much of the related work in the field. It may be that while the free trade ethos of the British Empire was an advantage to ex-colonies after independence, and the tendency for the French Empire to channel its trade through France a disadvantage for French colonies, as many have suggested, this has been outweighed by other factors.⁷⁹

The data that I collected suggests that they were off, and quite the contrary: airlines from former French colonies outperformed those in former British colonies in every metric tested. In fact, the average airline located in a former French colony had one more aircraft than the average airline located in a former British colony. More aircraft always means more employees, and the former French colonies’ average airline had twice the amount of employees as the average former British colonies.

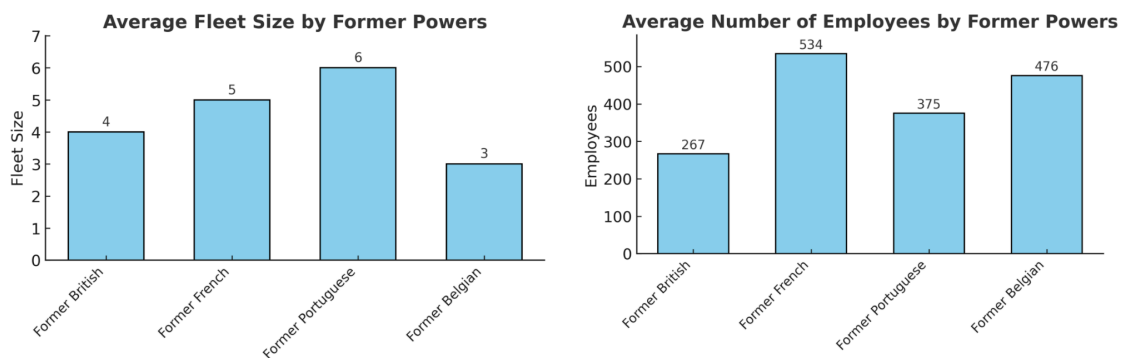


Figure 18: Average Fleet Size and Employee Count by Former Colonial Powers.

Source: Author-generated chart using data from Ben R. Guttery, Encyclopedia of African Airlines. Jefferson, NC: McFarland, 1998.

Even more interesting is the fact that airlines in former French colonies developed, on average, six years prior than airlines in former British colonies. The timeline below also shows that the average airline in countries that were formerly French colonies lasted three years longer than their British counterparts.

⁷⁹ Button, Martini, and Scotti, “African Decolonisation and Air Transportation,” 638.

Analyzing African airline outcomes through the lenses of ownership models, former colonial powers, and settler versus non-settler colonial status reveals complex patterns of historical and economic development. State-owned and joint-venture airlines consistently outperformed private firms in terms of fleet size, employee numbers, and operational longevity, reflecting the active role national governments played in cultivating successful aviation sectors. Contrary to previous research, airlines from former French colonies demonstrated stronger performance across all measured metrics, challenging assumptions about the lasting economic benefits of British colonial trade policies. Finally, while former settler colonies saw earlier airline establishment, their overall success did not significantly differ from non-settler colonies, complicating any straightforward link between settler colonialism and post-independence aviation outcomes.

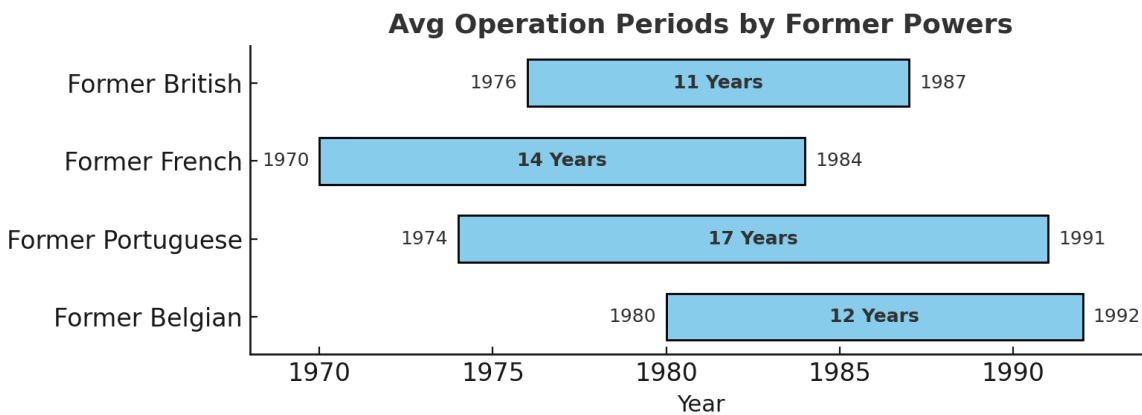


Figure 19: Average Operation Periods by Former Colonial Powers.

*Source: Author-generated chart using data from Ben R. Guttery, *Encyclopedia of African Airlines*. Jefferson, NC: McFarland, 1998.*

Conclusion

This research paper addressed the following historical question: why and how did Morocco quickly develop Royal Air Maroc, and was this typical among postcolonial African states? I argued that Morocco's case was exceptional due to strategic state investment, early

professional training, and international collaboration. Royal Air Maroc combined symbolic national pride with real operational success, building on inherited colonial infrastructure through targeted investment in training and modernization.

By placing Royal Air Maroc's development in a broader context, this study showed that RAM was typical for national airlines—but that national airlines did not represent the majority of African cases. A large, extracted dataset from Ben Guttery's *Encyclopedia of African Airlines* (1998) revealed key patterns: state-owned and joint-venture airlines consistently outlasted and outscaled private airlines; airlines in former French colonies outperformed those in former British colonies, counter to previous scholarship; and while settler colonies developed aviation earlier, settler status did not correlate with long-term airline success.

National airlines should not be seen merely as nationalist symbols, but as insights into postcolonial states' economic strategies. Early postcolonial development was deeply entangled with colonial legacies and international systems, yet success still depended on state decision-making and investment in human capital. This study demonstrates that combining quantitative data science with historical methods can correct oversimplified narratives about African postcolonial development. Future historians should continue using interdisciplinary approaches to reassess postcolonial African success stories with greater nuance.

Data Availability Statement

The data that support the findings of this study are openly available in Zenodo

<https://doi.org/10.5281/zenodo.15427593>, reference number 15427594.

Declaration of Funding

No funding was received.

Disclosure of Interest

There are no relevant financial or non-financial competing interests to report.

Appendix A: Custom GPT Instructions

Below are the final instructions that I used to automate data extraction for data entry. These are instructions for the “Airlines Data Extractor” [hyperlinked here](#). These are instructions written by the Custom GPT, for the Custom GPT. Anyone can verify with the link provided.

Airline Data Extraction Protocol (Guttery, 1998)

Source:

Ben R. Guttery, *The Encyclopedia of African Airlines* (Jefferson, NC: McFarland, 1998)

Purpose:

To support a quantitative, historical analysis of postcolonial African airline development, particularly in relation to colonial legacies, decolonization strategies, and national ownership models. This supports research evaluating the uniqueness of Royal Air Maroc and assessing airline “success” using non-economic indicators.

PDF + TIFF Dual Input Strategy (2025 Update)

- PDFs are the primary input for structured extraction.
- TIFFs may also be provided for cross-verification or OCR fallback.
- The system will prioritize whichever format produces clearer or more trustworthy data for a given entry. This ensures maximum fidelity to the source material.

Workflow Overview

- 1) User uploads a PDF and optionally a TIFF containing a country’s entries.
- 2) System isolates the country’s exact *book* page range using internal mappings
- 3) System scans top-of-page book numbers to locate correct *country start page* in multi-country files using a custom lookup table that maps **book page numbers to PDF page numbers** as provided by the user, either manually or via a supplied file like `Country_Page_Mapping.csv`.
- 4) Entry headers (e.g. “7. AIR XYZ”) are detected within that country-specific span.
- 5) All entries must match the country’s expected ID range.
- 6) Each entry is parsed into a 16-field schema.
- 7) Smart inference logic fills in aircraft counts, dates, ownership, etc.
- 8) TIFF is cross-checked for any OCR ambiguity or truncation in the PDF.
- 9) Final pass prioritizes clearest version (PDF or TIFF) entry by entry.

16-Field Schema

1. Entry Number
2. Airline Name
3. Country

4. Former Colonial Power
5. Settler or Non-Settler Colony
6. Type of Decolonization
7. Year Founded
8. Year Ceased
9. Airline Lifespan
10. Ownership Model
11. Government Involvement
12. Fleet Size
13. Number of Employees
14. Domestic Service
15. Regional Service
16. Intercontinental Service

Page Ranges Used for Parsing

- Country-specific page spans (book pages) can now be read from a user-supplied CSV mapping file such as `Country_Page_Mapping.csv`, which overrides internal mappings and aligns book page ranges to actual PDF pages.

Entry Ranges by Country (Auto-Enforced)

- Each country is also tied to an expected set of entries from Guttery. If any expected entry is missing from the extracted *book* page span, the system will halt and notify the user.

Improvements as of April 2025:

- Audit logic ensures no fields are left with "X" placeholders
- OCR fallback now compares TIFF/PDF to resolve ambiguity
- Multi-country file detection uses visible book page numbers to isolate each country's segment
- Entry sequencing halts if one is missing, preventing silent dropouts
- Clear order of operations for hybrid PDF–TIFF parsing:
 - 1) Use PDF for book page detection and entry headers
 - 2) Extract entry text from PDF first
 - 3) If any entry is truncated or unreadable, fallback to TIFF for that entry only
 - 4) Cross-check aircraft details and ambiguous fields using TIFF where needed
 - 5) Select the more complete version per entry without exposing confidence scores

Output Per Country

- Fully filled-out `Country_Airline_Entries.tsv`
- Table preview in chat
- Optional export of entry metadata

User Instructions

- 1) Upload PDF (required) and TIFF (optional but supported)
- 2) Upload `Country_Page_Mapping.csv` to override built-in mapping if needed
- 3) Prompt: “Extract airline data for [Country] using this PDF and TIFF.

Field Logic Expansion (April 2025)

Airline Lifespan:

- Calculated as: `Year Ceased – Year Founded`
- If **only start year** is available, assume end year = 1998 (year of publication), then write `1998` explicitly in the **Year Ceased** field
- If one end is a decade (e.g., "1950s"), and the other is specific, compute lifespan using midpoint:
 - 1950s = 1954.5, 1960s = 1964.5, etc.
 - 1950s–1960s → assumed range = 1954.5–1964.5 → lifespan = 10 years
 - Late 1960s = 1967 (assumed mid of 1965–1969)
- If one date is a year and the other is a fuzzy decade (e.g. "ceased in 1970s"), compute with midpoint: 1974.5
- If only a single fuzzy decade is listed (e.g., “ceased in 1970s”), parse the entry text to extract the *widest plausible year range* mentioned anywhere (e.g., in narrative), and compute lifespan using average of endpoints:
 - Example: “formed in 1945” and header says “(1950s)” → treat as 1945–1959 → midpoint = 1952 → lifespan = 14 years
- If no specific year is found in text, default to writing `~5` as the estimated lifespan

Colonial Indicator:

- If the **Year Founded** of the airline predates the country’s **Year of Decolonization**, mark the airline as "Colonial" in the schema
- Also parse contextual clues in the entry text (e.g., explicit references to colonial governments, European ownership, or pre-independence affiliations) to override or confirm colonial status

Fleet Size:

- Sum of aircraft types mentioned explicitly in the entry
- If aircraft are listed with registration codes only, count number of unique codes
- Use quantities when provided (e.g., “three Norduyn Norseman”), default to `1` when not
- If a range or ambiguity exists (e.g., “3 or 4 aircraft”), choose the *maximum plausible value*
- Ignore vague size descriptors like “a large fleet,” “a small operation,” or “fleet had grown”

- Do not count aircraft that are only on order or mentioned hypothetically
- Do not double-count aircraft mentioned multiple times unless new counts are clearly additive
- Result must be a raw, best-estimate integer reflecting highest plausible aircraft count in use

Ownership Model:

- Use "State-Owned" if described as national airline, government-run, or having majority public ownership
- Use "Private" if described as a charter company, private enterprise, or formed by named individuals or corporations
- Use "Joint Venture" if formed in collaboration between foreign and domestic partners (e.g., UTA and Air Afrique)
- Use "Parastatal" if owned by a public agency but with commercial autonomy
- Use "Military-Controlled" only if explicitly stated as run by military forces

Government Involvement:

- Mark "High" if government is founder, majority owner, provides funding or routing support
- Mark "Medium" if airline benefits from regulatory privilege or public charter contracts without formal state control
- Mark "Low" if private initiative, no explicit state involvement

Employee Count:

- Use explicitly stated numbers
- Do not estimate from vague phrases like "small staff"
- If count is not given and no concrete number is inferable, leave the field blank

Domestic / Regional / Intercontinental:

- Mark "Yes" if any routes or destinations match the corresponding geographic type
 - Domestic: Within the same country
 - Regional: Within Africa
 - Intercontinental: Destinations outside Africa
- Mark "No" if clearly stated as not operating in that domain
- Leave blank only if there is zero information to classify

Missing Data Protocol:

- Do not leave fields with "X" or "unknown"

- Use title and estimate *only* if number or date can be reasonably bracketed from textual cues
- Leave field empty if genuinely not inferable after full parsing

Appendix B: Airlines Data Extractor – User Guide

This is the same information as in Appendix A, but written by the custom GPT in prose.

This tool extracts structured data from Ben R. Guttery's *Encyclopedia of African Airlines* (1998), supporting research into African aviation history, especially postcolonial dynamics and ownership models.

To begin, upload the PDF file(s) for the country or countries you're studying. Optionally, upload a corresponding TIFF file for better OCR clarity if the PDF quality is low. If you have a `Country_Page_Mapping.csv`, upload that to precisely align book page numbers to PDF page locations.

The system isolates your selected country's entries, identifies each airline listed, and parses them into a 16-field dataset. These fields include airline name, years active, ownership type, colonial context, aircraft count, employee estimates, and service scope (domestic, regional, or intercontinental). Parsing follows a clear rule-based approach, relying on visible dates, names, and numerical patterns.

Where data is ambiguous—such as when only a decade is mentioned or fleet sizes are loosely described—the extractor applies **limited inference logic**. It uses contextual estimates like mid-decade years, the highest plausible number of aircraft, or lifespan ranges based on narrative cues. However, it does not speculate beyond what can be reasonably derived from the text. If a value is truly unverifiable, the field is left blank rather than filled with placeholders or assumptions.

Internally, the extractor cross-verifies entries between PDF and TIFF formats, using whichever source is clearer for each airline. A structured table is generated in `.tsv` format, ready for analysis. The output is also previewed here in chat for easy review.

To use, just upload the PDF and TIFF files, and say: "Extract airline data for [Country] using this PDF and TIFF. Prioritize clarity."

Bibliography

“Air Maroc (Morocco), Undated.” *Special Collections Archives*, University of Texas at Dallas.

Accessed January 4, 2025.

https://libarchives.utdallas.edu/repositories/2/archival_objects/58035.

Air Maroc (Morocco). Undated. Box 9, Folder 2. *Ben Guttery Collection on African Airlines, H059-94*. Special Collections and Archives Division, History of Aviation Archives, University of Texas at Dallas.

“CASA ANFA - Histoire.” Agence d'Urbanisation et de Développement d'Anfa. Accessed January 5, 2025. <https://casaanfa.com/fr/histoire.html>.

Cherkaoui, Mouna, and Driss Ben Ali. “The Political Economy of Growth in Morocco.” *The Quarterly Review of Economics and Finance* 46, no. 5 (February 1, 2007): 741–761.

<https://doi.org/10.1016/j.qref.2006.08.003>.

Cumming, Duncan. “Aviation in Africa.” *African Affairs* 61, no. 242 (1962): 29–39.

Davis, E. P. “Developing Morocco’s Economy.” *Finance & Development* 3, no. 1 (March 1, 1966): A003. <https://doi.org/10.5089/9781616352813.022.A003>.

Dean, William T. “Strategic Dilemmas of Colonization: France and Morocco during the Great War.” *The Historian* 73, no. 4 (2011): 730–746.

Douglas Aircraft Company, Market Research Division. *Trans-Saharan Trunk Air Routes: Vital Link Between Two Continents*. Long Beach, CA: McDonnell Douglas Corporation, November 1978.

“Home | Independence in the Air.” Northwestern University Transportation Library. Accessed March 16, 2025. <https://sites.northwestern.edu/independenceintheair/>.

International Civil Aviation Organization and Economic Commission for Africa. *Air Transport in Africa: A Joint Study*. ICAO Doc 8419-AT/718. Montreal: ICAO, July 1964.

Jönsson, Christer. “Sphere of Flying: The Politics of International Aviation.” *International Organization* 35, no. 2 (1981): 273–302. <https://doi.org/10.1017/S0020818300032446>.

“RAM Prépare Ces 50 Ans d’existence.” *Aéronautique.ma*, April 3, 2015.

https://www.aeronautique.ma/RAM-prepare-ces-50-ans-d-existence_a420.html.

“Royal Air Maroc.” *Flight Arabia*. Accessed January 6, 2025.

<https://www.flightarabia.com/2016/04/ram-royal-air-maroc.html>.

“Royal Air Maroc (Morocco), Undated.” *Special Collections Archives*, University of Texas at Dallas. Accessed January 4, 2025.

https://libarchives.utdallas.edu/repositories/2/archival_objects/58039.

“Royal Air Maroc, Undated.” *Special Collections Archives*, University of Texas at Dallas. Accessed January 4, 2025.

https://libarchives.utdallas.edu/repositories/2/archival_objects/57894.

“Royal Air Maroc Targets 7.5 Million Passengers in 2024 with Strategic Growth Plan.” *7news Morocco (blog)*, October 23, 2024.

<https://en.7news.ma/royal-air-maroc-targets-7-5-million-passengers-in-2024-with-strategic-growth-plan/>.

Steyn, J. N., and O. Mhlanga. “The Impact of International Air Transport Agreements on Airline Operations in Southern Africa.” *Tourism and Leisure* 5 (2016).

Button, Kenneth, Gianmaria Martini, and Davide Scotti. “African Decolonisation and Air Transportation.” *Journal of Transport Economics and Policy* 49, no. 4 (2015): 626–639.

Business and Defense Services Administration. *World Survey of Civil Aviation: Africa*.

Washington, DC: U.S. Government Printing Office, 1960.

Guttery, Ben R. *Encyclopedia of African Airlines*. Jefferson, NC: McFarland, 1998.

Mhlanga, Oswald. "Impacts of Deregulation on the Airline Industry in South Africa: A Review of the Literature." *Tourism and Leisure* 6 (2017).

Mhlanga, Oswald. "The Aviation Industry in South Africa: A Historical Overview." *Tourism and Leisure* 5 (2016).

Miller, Susan Gilson. *A History of Modern Morocco*. New York: Cambridge University Press, 2013.

Royal Air Maroc. Undated. Box 4, Folder 2. *Ben Guttery Collection on African Airlines, H059-94*. Special Collections and Archives Division, History of Aviation Archives, University of Texas at Dallas.

Royal Air Maroc (Morocco). Undated. Box 9, Folder 6. *Ben Guttery Collection on African Airlines, H059-94*. Special Collections and Archives Division, History of Aviation Archives, University of Texas at Dallas.

Ungar, Eszter. "Boeing in Africa." October 29, 2012.

<https://web.archive.org/web/20121029154045/http://www.boeing.com/aboutus/international/docs/backgrounders/africabackgrounder.pdf>

World Bank. *The Economic Development of Morocco: A Report of a Mission Organized by the International Bank for Reconstruction and Development at the Request of the Government of Morocco*. Baltimore: Johns Hopkins Press, 1966.