

Training and Management of Pilots across Generations

Max Scheck*

Introduction

Over the last couple of years, the Research Network for Academic Pilot Training (*Forschungsnetzwerk Hochschulausbildung von Piloten e.V.*) has repeatedly analyzed and discussed challenges surrounding pilot training in an ever-changing operational environment.

The focus here was on changes in aircraft design and technology – e.g. piston-engine aircraft to jet-engine aircraft, evolution from five-man cockpit crews in the first-generation airliners to the two-man crews in modern aircraft, or the introduction of “glass-cockpit” and fly-by-wire technology – in other words, the focus has been on changes in “aircraft(cockpit)-generations”.

An aspect that was not looked at in-depth is how the pilots have changed over the decades and if there actually have been different “pilot-generations” in commercial air traffic operations.

I believe that the pilots have significantly changed over the past 100 years and that there have been, in-fact, different “pilot-generations”. These changes are to some extent the result of the above mentioned changes in aircraft-design and technology, but also the result of changes in society as a whole (→ different cultural generations), as well as the result of changes in the operational environment (e.g. deregulation and globalization).

Other branches of industry and commerce have long realized that the generational changes have had an impact on their workforce. The respective managers are therefore trying to adapt the work environment accordingly to account for these changes.

I thus hold that an analysis and understanding of the changes in pilot-generations is fundamental when looking at selection, training and management of pilots in modern-day airline operations. Analogous to other branches of industry and commerce, such an analysis will help in recruiting the most qualified individuals. Additionally, this analysis is vital to ensure that the modern cockpit environment accounts for particular characteristics of the respective pilot-generations and their potential strengths and weaknesses.

Some questions worth exploring in this context are:

What are the different pilot-generations?

What are the strengths and/or weaknesses (if any) of these generations?

How should these strengths and/or weaknesses (if any) be accounted for in selection, training and management of airline pilots?

The following report is a summary of my presentation given during the 14th symposium of the Research Network for Academic Pilot Training (FHP) on 25 September 2011. The presentation was held in German.

Definitions

Ab-Initio Flight Training: The term *ab-initio* is Latin and means *from the beginning*. In the context of flight training, ab-initio refers to training programs that focus on a professional career at an airline, versus merely giving flight instruction.

Ab-initio flight training emerged in Europe in the 1960s, and some US flight academies began to offer ab-initio programs in the 1980s. Typically, ab-initio flight training involves less actual flight hours, but a more structured and complex overall training program. (Phillips, 2005)

*Adjunct Instructor for Embry Riddle Aeronautical University (Extended European Campus) and an active member of the Research Network for Academic Pilot Training (Forschungsnetzwerk Hochschulausbildung von Piloten) of the University of Darmstadt, Germany.

Crew Resource Management (CRM): Crew Resource Management (CRM) has become somewhat of a buzzword in the aviation industry and basically refers to the management of all resources (i.e. people, information and equipment) available to the crew.

The term CRM began to appear in the literature in the 1980s (at the time, standing for *Cockpit* Resource Management), as a label for a new approach towards trying to optimize the management and utilization of available resources. As the research and work surrounding CRM continued over the years, the applicable working environment was expanded from the cockpit outward to include the cabin crew, controllers, maintainers and other personnel (hence *Crew* Resource Management). (Swezey & Andrews, 2001)

Generation: Generation in the context of this report refers to cultural generations in the sense of broader social groupings of individuals who were born around the same date range and/or shared similar cultural experiences during defining episodes of their lives.

The philosopher/sociologist Karl Mannheim coined the expression “*Generationserlebnisse*” (generational experiences), which are significant events during youth, that have a lasting effect on entire cohorts of the respective year groups.

Mannheim emphasized that the rapidity of social change in youth was crucial to the formation of generations, and that not every generation would come to see itself as distinct. In periods of rapid social change a generation would be much more likely to develop a cohesive character (Wikipedia, 2011).

Limitations

Defining cultural generations will always carry a certain degree of subjectivity and consequently, there will be varying taxonomies and definitions of cultural generations. Also, such taxonomies and definitions will generalize and stereotype to some degree.

The report focuses on analysis of US-American generations. A comprehensive analysis of other countries would have gone far beyond the scope of my presentation. I did include a brief overview of some common German generations, as the audience at the FHP is predominantly German.

I could not find any taxonomy of “pilot generations” *per se* in the literature I reviewed; thus, the classification in Chapter 4 is my own. In my view, it makes more sense to analyze pilot generations by the date the individuals entered into the pilot-profession (versus birth-date), as the formative experiences as a pilot predominantly take place after having started the profession.

Socio-cultural influences on the other hand are more closely linked to the birth-dates. It is reasonable to assume that the pilot-generations are also influenced to some degree by the cultural generations the respective pilots belong to.

To fully understand pilot-generations, it is therefore imperative to analyze the corresponding cultural generations, in particular, their respective strengths and weaknesses. Classification and “labeling” of generations is always subjective to a certain degree; consequently, there are various such classifications. I did not analyze the various classifications in-depth, but simply used the most common taxonomy found in science and literature.

Commercial aviation began around 1920; assuming the average pilots start their professional career in their mid-20s, the cultural generations that need to be analyzed start at around 1900. The following chapter will give an overview of the most common taxonomy of cultural generations in the US since 1900:

1. Generations in the US since 1900

- 1900-1919 – The Greatest Generation
- 1920-1945 – The Silent Generation
- 1946-1964 – Baby Boomers
- 1965-1984 – Generation X
- 1985-2001 – Generation Y
- 2002-present - ??

1.1. The Greatest Generation (1900-1919)

The journalist Tom Brokaw referred to “The Greatest Generation” in his book of the same name (Brokaw, 1998) as those individuals, who were born into the new century, witnessed World War I as children/teenagers, grew up further during the Second Industrial Revolution in the “Roaring Twenties”, came of age during the stock-market crash of 1929, led the country through the ensuing Great Depression and fought in WWII.

This generation is considered to be very patriotic, hard-working, loyal, able to cope with hardship and value-oriented.

Famous members of the Greatest Generation include J.F. Kennedy, Ronald Reagan, J.D. Salinger and Charles M. Schulz.

1.2. The Silent Generation (1920-1945)

Members of this generation were born during the Great Depression and World War II; they suffered great hardship during their infant and adolescent years.

Journalists and writers would portray this generation as somewhat fatalistic and withdrawn, with little to no political interest – hence the label “silent”.

The “Silents” are generally considered to be loyal, team-oriented, afraid of taking risks, but also very creative.

Famous members of the Silent Generation are Noam Chomsky, Robert Kennedy, George Bush Sr., Marilyn Monroe, Harrison Ford, Hugh Hefner, Elvis Presley, Frank Zappa.

1.3. Baby Boomers (1946-1964)

Baby Boomers are persons born during the post World-War II economic boom, which saw America rise to a global economic power with widespread wealth across the American public. Consequently, they did not experience the hardships of the previous generations.

The baby-boom declined somewhat with the introduction of the “anti-baby pill” in the 1960s.

Common attributes associated with this generation are optimism and openness for change – sometimes resulting in rejection and redefinition of social values. Examples of this are the Civil Rights movements, or the Anti-Vietnam War demonstrations.

Baby Boomers are, however, also considered to be somewhat disloyal, narcissist and arrogant.

Famous Baby Boomers include Bill & Hillary Clinton, G.W. Bush, B. Obama, Gates, Steve Jobs, Michael Jordan, Tom Hanks, Michael Jackson and Madonna.

1.4. Generation X (1965-1984)

The X-ers are named after the book “Generation X – Tales for an Accelerated Culture”, by Douglas Coupland (Coupland, 1991).

Born into the relative wealth of the post-economic boom era, X-ers experienced several economic crises, such as 1973 oil crisis, the 1979 energy crisis, or the savings and loan crisis which led to the 1980s recession.

Generation X also witnessed the U.S. urban decay, the AIDS epidemic, the War on Drugs, the Space Shuttle Challenger disaster and the Iran hostage crisis.

On the other hand, Generation X also saw the introduction of the home computer, the beginning of the video game era, cable television and the Internet.

The combination of relative affluence on the one hand, but economic and political instability on the other hand resulted in Generation X-ers often being somewhat cynical and pessimistic.

Generation X is sometimes referred to as the “Slacker Generation”, as work no longer was considered the top priority in life, but instead, a “balance” of work and leisure activities was becoming more important.

Generally, attributes associated with Generation X-ers are individualism, independence and being very technical-savvy.

Famous Generation X-ers include Mark Zuckerberg, Tiger Woods, Lance Armstrong and Kurt Cobain.

1.5 Generation Y (Millenials) – (1985-2001)

Generation Y (also referred to as the Millenials) are the first truly “globalized” generation, as this generation grew up with computers in virtually every household and widespread use of the internet. This resulted in an increased use and familiarity with communications, media, and digital technologies – making Millenials true “multi-taskers” as far as modern technology is concerned.

Additionally, Millenials enjoyed the highest levels of education in American history, with this education being generally based upon a more neo-liberal approach to politics and economics, as well as more concern for environmental issues.

Attributes associated with Generation Y are extreme self-confidence (critics sometimes say arrogance), flexibility (they are used to a constantly and rapidly changing world) , high-expectancy levels (critics refer to this as Millenials being spoiled), strong family bonds, playfulness and a certain lack of tenacity (critics claim Millenials only work hard as long as they “are having fun”). Famous members of Generation Y include Lebron James, Paris Hilton and Lady Gaga.

1.6 Generation ??? (2002-???)

The latest generation has yet to be labeled. There is general consensus in literature and science that the events of September 11, 2001 have had such a grave impact on the US society (and perhaps the rest of the world) that this event marked the advent of a new generation.

The downsides of globalization, the new quality of terrorism, realization of the seriousness surrounding some environmental issues, introduction of social media and continued “flattening of the world” (Friedman, 2005) are shaping this new generation.

In the media this new generation has been referred to as “Generation NeXt” or “Facebook Generation” and the next ten years or so will show how this generation will manifest itself and what it will eventually be called. For the purpose of this paper I have used Generation NeXt from here on.

After this short review of US Generations from 1900 to the present the following chapter gives a brief overview of the corresponding German generations:

2. Generations in Germany since 1900

2.1. Jahrhundertgeneration (1900-1920)

Members of this generation grew up during massive political changes from the Kaiserreich into World War I, followed by the Weimar Republic.

This generation is generally considered to be politically active and open to change.

Famous members include Willy Brandt, Wernher von Braun, Marlene Dietrich, Johannes Heesters.

2.2. Kriegskindergeneration (1920-1945)

Continued massive social, cultural and economic fluctuations formed this generation. Germany losing World War I and World War II led to severe poverty, deprivation and suffering – in particular, as both wars were fought on German soil with heavy destruction and many casualties within Germany.

This generation is generally considered to be very conservative and based upon traditional values.

Famous members include Helmut Schmidt, Helmut Kohl, Helmut Rahn and Armin Mueller-Stahl.

2.3. 68-er Generation (1946-1967)

This generation is named after the student-protest movements of the late 1960s. Members of this generation grew up in the post-World War II Germany, experiencing hunger and misery as Germany was beginning to rebuild, with many fathers away as prisoners of war.

The 68-ers are considered to be very critical of society as a whole, very active and outspoken, as well as borderline militant in their choice of effecting changes in politics and society.

Famous members: Angela Merkel, Jürgen Trittin, Rudi Dutschke, Fritz Teufel, Franz Beckenbauer, Reinhard Mey, Klaus Meine, Udo Lindenberg.

2.4. Baby Boomers in Germany (1955-1967)

Children of this generation did not have to suffer as the previous generations did, as Germany was experiencing an economic boom (so-called “Wirtschaftswunder“).

This also resulted in a new national pride, reinforced by other national achievements (e.g. winning the Soccer World Cup in 1954).

Additionally, society became more open and permissive as the “sexual revolution” of the 1960s took place in Germany as well.

Famous members: Christian Wulff, Renate Künast, Cem Özdemir, Herbert Grönemeyer, Nena, Lothar Matthäus, Til Schweiger.

Generation Golf (1968-1979)

After the book of the same name by Florian Illies (Illies, 2000), in which this generation is portrayed as being very superficial, politically disinterested, self-centered and materialistic.

Similar to the members of Generation X in the US, members of Generation Golf no longer see work as a top priority in life, but want to spend more of their time on leisure activities.

Famous members: Phillip Rösler, Steffi Graf, Michael Schumacher and Bully Herbig.

MTV-Generation (1980-1994)

Introduction of private radio- and television networks in Germany led to massive increase in overall media presence. “Fun-factor” gains significant importance in every-day life of German kids.

This generation saw a growing awareness of environmental issues and the founding of the Green Party. It also witnessed the fall of the Berlin Wall and reunification of Germany.

The MTV-Generation is considered to be more independent and individual than previous generations in Germany. It is also attributed with being highly versed in modern technology.

Famous members include Sebastian Vettel and Mesut Özil.

Generation Praktikum (Generation Internship) (1995-present)

The level of education of the average German kid has steadily gone up over the past 50 years, with record numbers of “Abiturienten” (highest level of German high-school) and college students in German history (critics say the quality of education has suffered along the way).

The labor market on the other hand has become somewhat saturated, resulting in very stiff competition for available jobs – exacerbated by the fact that European Union expansion and globalization have led to an influx of “foreign labor” into Germany.

The children born after 1995 are thus faced with the dilemma of trying to meet the demands for whatever limited jobs are available and often resort to low- or non-paid internships to gain job-experience and to avoid long periods of “void” in their résumés.

There are some obvious differences between the generations in the US and Germany – e.g. Germany suffered significantly more after the two World Wars and, as defeated nation, obviously had to re-define its national identity and self-confidence. Nevertheless, I believe there are some remarkable similarities in certain attributes generally associated with the respective generations. In the following chapter I will take a closer look at some of these attributes and possible underlying root-causes for these.

3. Generation Attributes

The Silent Generation and the *Jahrhundertgeneration* were faced with significant political change, witnessed two World Wars and had to somehow lead their countries through economic crises.

The main attributes associated with these generations are patriotism, hard work, loyalty, active involvement and being value-oriented.

The Silents and Kriegskinder experienced the hardship and suffering of the Great Depression and war aftermath.

I think it is therefore quite understandable that they were somewhat conservative and afraid of taking risks. Being team-oriented, placing high value on solidarity and being creative was a means to survive during hard times.

As things improved economically, the Baby-Boomer and 68-ers obviously had more room for optimism and “self-actualization”- but also more time to deal with society and moral questions surrounding the same.

The more “open” approach towards society manifested itself in a more liberal and anti-authoritarian approach towards parenthood. This, in-turn, resulted in the Generation X-ers and Generation Golf being more fun-oriented and seeking more balance between work and leisure in their lives. Arguably, the foundation for the increased materialism was laid here as well.

Economic drawbacks and realization of some of the global issues (e.g. environmental pollution or overpopulation) led to the cynical and fatalistic outlook on life.

Technical innovations and increased media-presence made Generation X-ers and the MTV-Generation more tech-savvy and fun-oriented – a trend that continued with the Generation Y (Millennials) and *Generation Praktikum*.

Faced with increased competition on a rapidly “global” market with limited resources, Generation Y and Generation Praktikum are seeking ever-higher levels of education and qualification – at the same time, however, as they grew up in relative wealth and security their expectation levels are very high.

Additionally, they are used to a very high-paced and personally customized life style – fueled by mass-media and modern communication technology – and have little patience or willingness to accept conditions other than what they have become accustomed to expect. As mentioned in Chapter 1.5., critics of Generation Y claim that this generation only works hard as long as it is “having fun”.

To illustrate the above, I want to make a brief comparison between two prominent sports-stars – Michael Jordan and LeBron James:

3.1. Comparison of Michael Jordan and LeBron James

Michael Jordan was born in 1963 (putting him at the end of the Baby Boomer Generation) and LeBron James was born in 1984 – right at the border between Generations X and Y. Both, Jordan and James, came from an average family background and had their basketball talents recognized during high-school.

Jordan then went the “traditional” route of attending college with a basketball scholarship (winning the NCAA-Championship during his time at the University of North Carolina) and then entering the NBA as a professional player after graduating with a college-degree. James on the other hand, went from high-school directly into the NBA as a professional.

In his 15-year career as a professional, Jordan won the “NBA Rookie of the Year Award”, six NBA Championships, 2 Olympic Gold Medals and was selected as the NBA Most Valuable Player five times and also once as the Sportsman of the Year.

James has been a professional for nine years now. During this time he also won the NBA Rookie of the Year Award and two Olympic Medals (gold and “only” bronze). He was selected as the NBA MVP twice, but he has yet to win a NBA championship.

Critics of James say that he is lacking the tenacity of a true champion. They attribute this partly to the fact that he did not go to college and matured as a player there, but instead took the fast-track to becoming a professional.

Additionally, critics say that James is too pre-occupied with other things such as advertising and marketing and lacks the “true spirit”, as evidenced by his recent move from the Cleveland Cavaliers to the Miami Heat – a move seen by many as a desperate attempt to finally win a NBA Championship, as the Miami Heat is loaded with other star players.

Nevertheless, the Miami Heat lost the finals to the Dallas Mavericks this past season and James had to take the brunt of the blame for the loss as critics saw his performance in the finals as lackluster and uninspired.

They compare this with performances of Michael Jordan (e.g. the legendary “flu game” in Game 5 of the 1997 NBA-final, where he played despite being sick and carried his team to victory) and come to the conclusion that at his current state of mind and performance James will never reach the level of Jordan.

An obvious question that comes to mind is why James is apparently lacking the “bite” to persevere, in particular, when things are not going his way. As I mentioned above, critics of Generation Y have noted this particular characteristic (i.e. only working hard as long as they are having fun).

Mary Crane, from Mary Crane and Associates Consulting (Crane, 2011), has a theory on the above. She attributes this “lack of bite” to what she calls the T-ball mentality.

3.2. T-ball Mentality

Baseball is arguably America’s favorite past-time, but undoubtedly a pillar of American culture and a cornerstone in virtually every American kid’s adolescence.

A basic concept of baseball is, of course, that a ball is pitched and the batter has to try to hit this ball – a rather complex process where the batter has to have a certain degree of hand-to-eye coordination and timing skill.

Generally, the batters get three attempts to hit the ball and, if they fail, they are out. As the process is so difficult, chances of failure are high – carrying a lot of potential for frustrating the kids who fail to hit the ball.

Frustrating their “little ones” did not sit well with the parents of the outgoing Generation X and incoming Generation Y in the early 1980s. As I mentioned earlier in Chapter 3 above, Generation X saw a more liberal approach towards parenting, a trend that continued with the Millennials.

This more liberal approach towards parenting resulted in exploration of alternatives to the traditional ways of bringing up children. In the area of baseball, T-ball was introduced, where the ball is not pitched but, instead, set stationary upon a “Tee” (similar to a golf-tee) and the kids now have all the time in the world to negotiate their swing to hit the ball. Additionally, in T-ball there is no limit to the number of swings a player is allowed, so there are no outs and no one fails.

In the T-ball leagues that established themselves throughout the country, players were rewarded with ribbons and trophies for simply showing up and participating. Other sports followed suit and an overall mentality of “everyone is a winner” manifested itself in the Generation Y. The result of this was that the Millennials no longer have a true concept of failure, or the skills to handle it.

Mary Crane further holds that this approach of the parents “adapting the rules to the players (i.e. their children)” rather than “the players adapting to the rules” has extended beyond baseball into many other facets of life for the Millennials. With declining birthrates, the few children born as Millennials are “treasured and pampered” throughout their childhood and beyond.

It is not unusual for Millennial-parents to actively engage with the teachers, professors and employers of their children whenever there are problems, generally seeing the underlying faults with anything but their children. If we accept Mary Crane’s argument, it comes as no real surprise that the Millennials may not have quite the “bite” of previous generations. It also explains the strong family-bonds we find in Generation Y.

Every generation since 1900 has shown some particular characteristics, as well as certain strengths and weaknesses. Obviously, there is plenty of room for critics of one generation or the other to zoom in on these. While such criticism may be appropriate in certain circumstances, I believe it does not really help in creating an optimal work-environment and, therefore, I have not explored such criticism any further in this paper.

Instead, I think it is important to appreciate the fact that there are different generations and to understand the particulars of the respective generations, as they are the pool from which the pilot-generations, which I will introduce in the following chapter, are composed of.

As I mentioned in the Limitations above, I used the entry into the pilot profession (versus birth-date) as cut-off. Consequently, the respective pilot-generations may be composed of members of more than one cultural-generation.

I also want to re-emphasize that the following taxonomy of pilot-generations is entirely my own. As with most generation taxonomies, there is a certain subjective element involved. The labels I have come up with may seem stereo-typical, perhaps even somewhat heretical, to some readers. My intent was not to “brand mark”, but provoke discussion and awareness.

4. Pilot Generations

- 1920-1944 – Pioneers/Adventurers
- 1945-1977 – Golden Boys
- 1978-2001 – Professional Pilots
- 2002-present – Specialized System Managers

4.1. 1920-1944 - Pioneers/Adventurers

Type: Flight-Cap, Goggles and Silk-Scarf

Generally, these pilots held non-flying jobs before, during and after their piloting-careers; as commercial aviation was in its infancy and flying itself was not always sufficient to earn a living.

The main incentive for these pilots was not the pay, but the adventure/exotic aspect of flying. In the public eye, these pilots were “daredevils” and enjoyed a certain standing as such – comparable to “extreme sportsmen” nowadays.

These pilots generally had a diversified flying background - including airmail, military flying (combat operations in World Wars I and II), “barnstorming-type” exhibition flying and some passenger service.

The pioneers/adventurers often flew many different aircraft types/categories (sometimes self-built and/or experimental) in various conditions (initially only in visual meteorological conditions – after the 1930s increasingly also according to instruments).

With aviation being in its infancy the aircraft, engines and systems were not very reliable and the underlying infrastructure rudimentary at best – consequently, pilots of this generation most definitely experienced in-flight emergencies, system failures, emergency landings, and perhaps even crashes.

The “job-spectrum” of pilots of this generation often encompassed the entire flight operations; so the pioneers/adventurers often were engineer, mechanic, dispatcher and pilot in one person.

Pioneers/adventurers came exclusively from the Greatest Generation – prominent members include the Wright Brothers, Glenn Curtiss, Baron Manfred v. Richthofen, Eddie Rickenbacker, Charles Lindbergh, Amelia Earhart.

Aviation on a whole was initially only minimally regulated and there were little to no structures. Regulation of aviation in the US on a larger scale began in the 1930s (Civil Aeronautics Act of 1938) and internationally with the Chicago Convention of 1944 [founding of the International Civil Aviation Organization (ICAO)].

4.2. 1945-1977 – Golden Boys

[NOTE: I chose “Boys”, as commercial aviation was almost exclusively a male domain during this time.]

Type: Officer and Gentlemen [as portrayed in the book “The Right Stuff” (Wolfe, 1979) – made into a movie in 1983, or the “Airport” movies of the 1970s]

The end of World War II and founding of ICAO (see above) marked the dawning of a new era for commercial aviation.

Technological advances made during the war, a large pool of trained/experienced pilots and closer international cooperation led to a true boom in air passenger and freight operations – a “Golden Era” for commercial aviation.

Most large airlines were “quasi-state” airlines, with the pilots as “civil servants” or of similar standing. As such, the jobs with such airlines were quite secure – pay was relatively good.

In the public eye, pilots enjoyed a very high social standing – they were still regarded as “adventurers”, but at the same time earned relatively good money and also had a “cosmopolitan flair”. The image of a pilot in this era is almost that of a “superman” who can handle any situation calmly and afterwards enjoy a cocktail with you at the bar as if nothing happened.

The Golden Boys generally had a diversified flying background, with most of the pilots coming from the military (often with some combat experience). Most of these pilots had also flown various types/categories of aircraft over the course of their flying careers.

The spectrum of duties was by-and-large limited to the flying-aspects of the job; so, the Golden Boys generally did not perform a lot of “non-flying” duties.

There were rapid, and many, technological advances/innovations during this time. The Golden Boys saw the introduction of jet-engines into commercial operations and increased automation. While the aircraft, engines and systems did get better and more reliable, the average Golden Boy probably did have some experience with in-flight emergencies.

Prominent Golden Boys include Howard Hughes, Juan Trippe, Chuck Yeager and Neill Armstrong [NOTE: Chuck Yeager and Neill Armstrong were not commercial pilots, but portrayed the overall image of a pilot during this era – i.e. the “superman” mentioned above or “right stuff” portrayed in the book of the same name (Wolfe, 1979)].

The Golden Boys were made up of members of the Greatest Generation, the Silent Generation and the Baby Boomers.

Commercial aviation in the US was heavily regulated until the Airline Deregulation Act of 1978.

4.3 Professional Pilots (1978-2001)

Type: Young Entrepreneur of the Reagan Era

The Deregulation Act of 1978 marked a significant change to commercial airline operations in the US (deregulation in Europe did not begin until the end of the 1980s).

Airlines now were no longer “quasi-state entities” with protected routes and guaranteed revenue, but instead had to deal with the forces of an open market. As a result, several airlines went bankrupt (e.g. PanAm, Eastern Airlines or Braniff).

Pilots saw themselves confronted with “new management styles”, where working conditions and salaries are part of cost-analysis and corporate-controlling divisions. For the first time, pilots had to engage in large-scale labor-disputes and began to organize themselves in unions.

The job of an airline pilot thus lost some of its luster as an adventurous/mysterious profession and often paid less. Additionally, as air passenger traffic became more of a “mass-transportation” (versus exclusive high-society transportation) the overall social standing of pilots deteriorated significantly.

I chose the label “professional” to signify a shift on the overall outlook on a commercial piloting career. Previous pilot-generations were just as professional concerning the flying-aspects of the job, but these generations did not really have to deal with such things as labor-negotiations or collective bargaining, while the post-deregulation pilots did. In that sense, these pilots became more “professional” as the profession of being a commercial pilot evolved from “a higher calling” to “just a job”.

Compared to previous pilot generations, members of the “Professional Pilot” generation generally have a less diversified flying background. While a lot of the pilots still started their careers in the military, other career paths began to evolve (e.g. corporate flying or “ab-initio training”).

Technological advances continued (e.g. “glass-cockpit” or “fly-by-wire”-technology), but were predominantly in automation and increasingly driven by economic aspects – leading to successive “replacement” of humans by machines/systems [i.e. continued evolution from five-man cockpit (Captain, Co-Pilot, Flight Engineer, Navigator and Radio-Operator) to the two-man cockpit (Captain and Co-Pilot)].

As aircraft and underlying systems became better and more reliable, chances of experiencing a “real-world” emergency became less. Additionally, simulators and other synthetic training devices were increasingly utilized – thus, even the “emergency training” shifted from the “real aircraft” to a “virtual environment”.

While the economic environment was being de-regulated and as economic pressures mounted, pilots were also increasingly tasked to perform “non-flying duties” (for example, management of ground operations).

The operational environment, on the other hand, remained fairly regulated, with clear structures and requirements.

Overall, the complexity in and around the cockpit significantly increased. This was recognized by analysts, who identified the need for additional training so that pilots could cope with these new challenges. Some of these analysts (e.g. Helmreich & Foushee, 1993) came to the conclusion that modern pilots should not be the “supermen” of the Golden Boys Era, but instead more team-oriented individuals, who had been trained in human factors. Such training was introduced in the 1980s and later become known as “Crew Resource Management” (CRM) training.

With the above shift away from “supermen” to “team-players”, I have deliberately refrained from mentioning any particular prominent member of the Professional Pilots. They are made up of members of the Silent Generation, the Baby Boomers and Generation X. As I mentioned earlier, the events of September 11, 2001 had a significant impact on US society as a whole (arguably the entire world). As the terrorists had used commercial aircraft as “weapons of destruction”, entirely new concepts of safety and security were introduced into commercial flight operations. I therefore believe a new generation of pilots resulted from this as well.

4.4 Specialized System Managers (2002-??)

Type: ??? (Yet to be determined)

The events of 9/11 showed how volatile the highly “optimized” air traffic system had become by the turn of the millennium. Confronted with this realization, new concepts (in particular, concerning security) had to be developed. Unfortunately, the degree of international harmonization continues to leave a lot to be desired, resulting in significant variances from one country to another.

These added security measures – not only for the passengers, but increasingly also for the crew-members – have made the airline flight experience a lot less enjoyable. Airline travel has thus significantly lost the appeal it had in previous generations.

Additionally, the economic pressure has increased – leading to a much bigger spectrum in salaries and working conditions for pilots (e.g. very low salaries and unattractive conditions with small commuter airlines, compared to relatively high salaries and good conditions with major airlines).

“No Frills” airlines have manifested themselves as major players in the airline business. As globalization continues, competition among airlines also continues, with many airlines constantly operating on the verge of bankruptcy.

Workplace mobility for pilots has increased immensely. As airlines come and go and operating bases move, pilots often have to move as well (or travel to and from their respective operating bases).

Cost control has perhaps become the main focus (critics caution that this may at times compromise safety). To cut cost, training programs are being optimized (e.g. new multi-crew pilot license), with even more shift towards synthetic flight training (versus training in the “real” aircraft).

The trend to task the pilots to perform many additional duties in and around the overall flight operations also continues. The overall aim is to “optimize” operations wherever and whenever possible.

Operators have “streamlined” their fleet of aircraft to cut down on maintenance and operating costs. Manufacturers introduced “aircraft families” (e.g. Airbus A320 – 330 -340 – 350 – 380 series), which have very similar systems and cockpit-layouts, making transition from one such type to the other easier.

While the above has cut down on operating costs, it has also resulted in the pilots having less experience in flying different aircraft types. Chances are that the modern airline pilots may only fly one aircraft type (or aircraft family) throughout their entire piloting career.

Simultaneously, the level of automation is steadily increasing – leading to less requirement for “manual flying skills” – while the overall systems (both in the air and on the ground) are becoming more complex.

The modern aircraft and systems have become extremely reliable, so the chances of pilots experiencing “real world emergencies” are very slim.

Overall, the pilots of this latest generation have thus become “specialized system managers”.

They have to somehow find a way to deal with an increasingly complex work environment under increased economic pressure and yet maintain their “piloting skills”. They are made up of members of the Baby Boomers, Generation X and Generation Y.

Reviewing the different pilot-generations from the 1920s to today it is obvious that there have been some significant changes.

There are some obvious characteristics of the respective pilot-generations, which translate into certain strengths and weaknesses. For example, the Pioneers/Adventurers and Golden Boys undoubtedly had better “manual flying skills” than later generations. On the other hand, today’s Specialized System Managers are much better multi-taskers, able to deal with a much more complex cockpit environment.

Just as the changes in the cultural generations over the past decades have been the result of changes in society, the evolution of the airline pilots has been the logical consequence of the changing operational environment (i.e. combination of technological developments/advances, economic developments, geo-political events and changes in society as a whole).

5. Summary and Conclusions:

Generations in the sense of this paper are groups of people who share certain defining experiences and are thus shaped into a group with certain specific characteristics.

These specific characteristics translate into certain attributes that are generally associated with the respective generations. These attributes can be viewed as strengths or weaknesses – the determination of which, of course, carries a certain subjective element.

Generally, cultural generations form about every 20 years – so, there will typically be four to five generations living at the same time. Acknowledging the fact that in today’s world people roughly work from their 20s through their early 70s, you will probably find three to four generations simultaneously at the average workplace – in other words, a “multi-generational workplace”.

Industry and commerce have realized this and increasingly begun to analyze the particular characteristics of the generations to ensure the workplace accounts for the changes in generations and allows for an optimum work-environment for all workers. This analysis is often done with regard to the specifics of the particular branch of industry or commerce, leading to specific generational taxonomies in the respective industries.

To the best of my knowledge, such an analysis has not been done yet in commercial aviation. I believe such an analysis is important as there have been massive changes in society and the airline operational environment. Analyzing and understanding the different pilot generations could prove to be helpful in selection, training and management of pilots.

Pilot-Generations are the product of the underlying cultural generations (i.e. the respective cultural generations from which the pilot-generations are recruited), the operational environment (i.e. technological and economical) as well as significant events surrounding the flight operations (e.g. geo-political events).

Commercial aviation began in the 1920s – assuming that pilots begin their flying careers in their mid-20s, it makes sense to look at cultural generations since 1900. These generations were the Greatest Generation, the Silent Generation, the Baby Boomers, Generation X, Generation Y and the current generation which yet has to be labeled (I used Generation NeXt for the purpose of this paper).

Each of the above generations has certain attributes. In today’s cockpit we still find members of the Baby Boomers and later generations, so for the sake of optimizing selection, training and management of today’s pilots – as well as understanding the potential strengths/weaknesses of these, analysis of generations from the Baby Boomers on is appropriate:

Generation/Attributes	STRENGTHS	WEAKNESSES
BABY BOOMERS	optimistic open engaged	disloyal over-critical
GEN X	technically well versed very flexible	“slackers” pessimistic
GEN Y	multi-taskers high level of education self-confident	spoiled “no bite” high expectancy level arrogant
GEN neXt	Multi-media savvy Inter-cultural Global Players optimistic	non-critical individualistic

The above cultural generations are quasi the “raw material” from which the pilots have been shaped over the decades. Developments in aviation, such as technological advances (e.g. jet-engines, automation or glass-cockpit), changes in the operational environment (e.g. globalization) and significant events (e.g. 9/11) were the main forces in this process. My analysis resulted in four pilot-generations since 1920 – the Pioneers/Adventurers (1920-1944) – the Golden Boys (1945-1977), the Professional Pilots (1978-2001) and the Specialized System Managers of today.

The following matrix summarizes some of the main characteristics of these generations:

Pilot-Generation Matrix	Pioneers/ Adventurers	Golden Boys	Professional Pilots	Specialized System Managers
Flying Background	very diversified	diversified	little diversified	specialized
Different Aircraft Categories/Types Flown during career	many	some	few	very few
Manual Flying Skill Proficiency	very high	high	high to medium	medium
Experience with Real World Emergencies	definite	probable	possible	unlikely
Social Standing	High (exotic)	very high	high	high - medium
Salaries	low - medium	very high	high	high - medium
Existing Regulatory Framework	None limited	extensive	extensive operational limited economical	extensive
Automation	none	little	high	very high
Use of Synthetic Training Devices (Simulators)	none - little	little - some	some – a lot	extensive
Spectrum of Duties (incl. non-flying)	large	medium	medium - large	large
Human Factors Training	none	some <i>„the right stuff“</i>	some – a lot <i>„the wrong stuff“</i>	a lot <i>CRM</i>
Economic Pressure	None	None - Low	Low- Medium	Medium-High

In today’s airline cockpits we generally no longer find members of the Pioneers/Adventurer generation – thus, the following table does not include the potential strengths/weaknesses of that generation:

Pilot Generation Strengths/Weaknesses	STRENGTHS	WEAKNESSES
GOLDEN BOYS	diversified flying background lots of “real world” experience solid manual flying skills	little human factors training unable to “think outside box”
PROFESSIONAL PILOTS	very “tech-savvy” some “real world” experience	lack of loyalty bitter
SPECIALIZED SYSTEM MANAGERS	multi-tasker lots of human factors training self-confident	Lack of manual flying skills Lack of “real world” experience

I have mentioned throughout this paper that the judgment on whether a particular characteristic is a strength or weakness is subjective to some degree. Consequently, there is plenty of room for discussion on whether a particular attribute is, in fact, a strength or weakness; and how significant these respective strengths/weaknesses are.

Regardless of whether particular generational attributes are viewed as strength or weakness, there is general consensus among scholars and analysts that there are differences between generations. So, rather than focusing on the judgmental aspect of the particular attributes, the focus should be on potential operational consequences that may result from these.

In other words, one key to optimizing the multi-generational cockpit-crews is to acknowledge the fact that there are different pilot-generations, with particular attributes. Knowledge of these attributes is vital when screening and selecting new pilots. Additionally, the particular attributes need to be accounted for in the training and management of the respective pilot generations, which brings me to the outlook.

6. Outlook

Optimizing commercial flight operations will continue to be a challenge as complexity of the systems involved (both hard- and software) increases, the operational environment rapidly changes (i.e. globalization) and economic pressures increase.

The only way to manage the above and at the same time ensure safe flight operations will be maintained, is to use the existing resources in the most effective and efficient manner. The most valuable resources in this context are the human resources. Pilots, obviously, are one of the central human resources in flight operations.

I have shown in this paper that we find different pilot-generations in the airline cockpit of today. Older generations have a broader experience in terms of “manual flying”, while the younger generations are more tech-savvy and used to multi-tasking.

Training programs need to account for this, by ensuring each generation has the opportunity to train in the particular area(s) in which they may have particular shortcomings. Additionally, regulators need to keep their eyes on this as well, to ensure these shortcomings (if any) do not jeopardize safety.

The cockpit and systems also need to be designed and equipped accordingly. A member of the Golden Boys generation may not as easily adapt to an “electronic flight bag” as the new Specialized System Manager pilots do. The Golden Boys will probably have to accept the “paperless cockpit” sooner rather than later; however, they should be given the tools (e.g. training) to learn the new technology, and not have it “forced down their throat”.

Overall work conditions outside the cockpit need to be adapted to the new generation. The Millenials expect certain things (e.g. balance of leisure time and work) and are used to a more “liberal” work environment (with constant and plenty feedback). If airline managers want to recruit and keep the best there are, the working environment will have to be adapted accordingly.

The newest pilots are predominantly members of Generation Y and will soon be Generation NeXters. I showed in Chapters 2 and 3 that these generations will work hard as long as they are “having fun”.

Airline management should keep this in mind when it comes to the overall working conditions.

Finally, the pilots themselves need to be made aware of the fact that there are different pilot generations. This awareness should be as “neutral” as possible (i.e. without any judgment on potential strengths/weaknesses of the respective pilot generations), focusing more on differences/particulars.

Ideally, the combination of the above will create synergies and efficiencies, as flight operations are optimized with due regard to these differences/particulars. Failure to do so, will inevitably lead to friction and inefficiencies – perhaps even incidents or accidents.

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