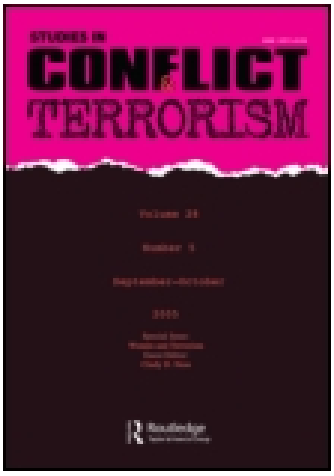

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Al Qaeda's Operations: Project Management Analysis

Ofer Zwikael [a]
[a] Victoria University of Wellington , Wellington, New Zealand
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Al Qaeda's Operations: Project Management Analysis

OFER ZWIKAEL

Victoria University of Wellington
Wellington, New Zealand

In recent years, Al Qaeda succeeded in perpetrating several terrorist attacks that were successfully calculated and executed. Each operation may be considered to be analyzed as a project. This article analyzes the events taken by Al Qaeda prior to their operations, focusing on planning, controlling, and decision-making processes, using common tools from the project management area. This unique approach enables an understanding of the operational aspects of Al Qaeda and the managerial processes that its leaders were focused on. It was found that Al Qaeda's greatest managerial strength lies in human resource management, which includes team members recruiting, developing a clear organizational structure, team developing and team members motivating. Al Qaeda's greatest weakness lies in time management, resulting with many operations' schedule delays.

Introduction

Al Qaeda's attacks have been vastly discussed from many points of view. This article is the first to analyze these operations using project management methodology. This approach analysis the managerial decision taken by Al Qaeda's leaders while preparing to these operations, aimed at finding its strengths and weaknesses.

This analysis includes the major operations taken between 1993 and 2001 by Al Qaeda, a terrorist network that was established in 1988 and has been led since then by Osama bin Laden. The major operations in this period and beyond are described in Table 1.

All these operations were investigated and analyzed in books, papers, and newspaper articles. The biggest operation, 9/11, was also investigated by the "National Commission on Terrorist Attacks upon the United States" (also known as "The 9/11 Commission").

This article focuses on the managerial processes taken by Al Qaeda's leaders prior to these operations and analyzes them according to common Western project management methodologies. This unique approach can highlight new angles for some well known stories. Yet, in order to be able to make this analysis, the article first reviews relevant project management literature.

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Address correspondence to Ofer Zwikael, Ph.D., PMP, Victoria Management School, Victoria University of Wellington, Rutherford House, 23 Lambton Quay, P.O. Box 600, Wellington 6140, New Zealand. E-mail: ofer.zwikael@vuw.ac.nz

Table 1
Al Qaeda's major operation between 1993 and 2001

Year	City, country	People killed	Comments
1993	New York, USA	6	A bomb exploded under the World Trade Center in New York
1995	Riyadh, Saudi Arabia	5	A car bomb exploded outside a building leased by the Pentagon for American military contractors
1996	Dhahran, Saudi Arabia	19	U.S. servicemen were killed in the Khobar Towers military complex
1998	Kenya and Tanzania	247	Two simultaneous attacks on U.S. embassies
2000	Sana, Yemen	17	An attack on U.S.S. *Cole*
2001	Washington and New York, USA	Almost 3,000	Four airplanes attacks
2002	Bali, Indonesia	202	Three bombs exploding killing Western holidaymakers
2002	Djerba, Tunisia	21	Truck bomb exploded outside a synagogue
2003	Istanbul, Turkey	57	Several explosions
2003	Casablanca, Morocco	39	Five simultaneous attacks
2004	Madrid, Spain	200	Simultaneous explosions in three railway stations
2005	London, UK	52	Tube and bus systems were attacked

Project Management Literature Review

A *project* is a temporary endeavor undertaken to create a unique product or service (PMI 2004). All of Al Qaeda's operations fit this definition and share the three most important project characteristics, as recognized in literature (Kerzner 2001; Meredith and Mantel 2003 and others), as follows:

1. *Uniqueness*. All operations' final outcome were very unique, where no event in history can be compared to be similar to in aspects of means taken, targets chosen, and surprise.
2. *Temporariness*. These plots were planned and executed within timelines bounds, starting with a first idea in, usually ending with several simultaneously explosions.
3. *Predefined goals*. These plots had clear goals defined by bin Laden. As happens in most projects, specific targets are changed throughout the project (i.e., the number of planes or the areas to attack in the 9/11 plot), but the main objectives and means remained unchanged.

A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually are called a program (PMI 2004). The combination of all Al Qaeda's operations during these years can be identified as a program because they shared the same global objective. Moreover, being managed by the same organization gave an opportunity of having a massive impact and the ability to learn

from previous mistakes. Hence, each Al Qaeda operation can be seen as a separate project in a larger program.

The PMBOK® (PMI 2004) is the most common body of knowledge in the area of project management. It includes the identification of 44 processes that should be performed by the project manager during the project's or a program's life cycle. These processes are grouped into nine knowledge areas, as follows:

1. *Integration*. Includes integrative processes required to ensure that the various elements of the project are properly coordinated.
2. *Scope*. This knowledge area makes sure that the project includes all and only the necessary work required to complete the project successfully. This knowledge area includes product scope (features and functions that are to be included in a product or service) and project scope (work that must be done in order to deliver a product as specified).
3. *Time*. Scheduling is the process of integrating information regarding duration of activities, precedence relationships, and required due dates, in order to determine the dates in which resources are to perform the various activities that are part of the project.
4. *Cost*. Processes include planning and controlling the project budget.
5. *Quality*. Processes performed to reach the totality of features and characteristics of a product or service that bear on its ability to satisfy a customer's given needs.
6. *Human resources*. Processes required making effective use of the people involved in the project, including organizational planning, staff acquisition, and team development.
7. *Communications*. The processes required in order to assure the timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. This knowledge area includes communications planning, information distribution, performance reporting, and administrative closure.
8. *Risk management*. Processes dealing with identifying and reducing the project's risk level, including risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, and risk monitoring and control.
9. *Procurement*. Processes require the acquisition of goods and services from outside the performing organization. This knowledge area includes: procurement planning, solicitation planning, solicitation, source selection, contract administration, and contract closeout.

Now that the main body of knowledge in the area of project management has been described, Al Qaeda's operations are analyzed according to these knowledge areas. It is assumed that Al Qaeda's leaders were not aware of this methodology. Still, this analysis may serve to shed light on the managerial processes that were performed intuitively during these operations.

Al Qaeda's Operations—Project Management Analysis

Al Qaeda was established in 1988 by Osama bin Laden in order to spread jihad (Holy War) throughout the world. "Al Qaeda" comes from the Arabic root *qaf-ayn-dal*, meaning a base, a foundation, or a pedestal that supports a column (Burke 2004). Al Qaeda is considered to be the fourth wave of terror's flagship (Rapoport 2004). This current wave follows three

previous phases: (1) the first wave created the doctrine in the nineteenth century, (2) the second wave, between the two world wars, described anticolonial terrorists as "freedom fighters," and (3) the third wave, also called "new left wave," was represented by the Vietnam War, IRA, and PLO. The fourth wave, also known as the "religious wave," involves both Jewish terror attacks (i.e., Abraham's tomb, Hebron, 1994) and Christian terror (Oklahoma city bombing 1995). However, Islam is the heart of this wave (Rapoport 2004).

Most operations performed by Al Qaeda between 1993 and 2005 can be defined as successful operations. Under project management's common success measures (PMI 2004), these operations can be defined as a great "success": most of them were executed on time, stayed within the projected budget, and met most of their objectives. Another project success measurement looks at opening new opportunities for the future (Dvir et al. 2003). In his analysis, Nacos (2003) forecasts that the suicide attack of 9/11 could well become an attractive model for future terrorist attacks.

Before analyzing these successful projects using project management methodology, it may be stated that this common methodology was not developed for such projects, but it can still be the basis for a comparison. The analysis will be based on the traditional nine project management knowledge areas that were described earlier (PMI 2004).

Integration

Integration is the project knowledge area that merges all other knowledge areas. As it is the responsibility of the project manager to see the whole picture, it may be assumed that bin Laden had the picture of the wood, whereas most of the participants could see only some of the trees in the forest. Moreover, a long-term, multiple attacks plan was always handy and updated. When a new idea was brought up, it first had to be discussed and approved. For example, when Zuhair Hilal Mohammed al-Tubaiti suggested himself in 2000 to commit a suicide in any operation, he was asked to go away and formulate a plan to be submitted for approval like everyone else (Burke 2004).

In a project, "Integration" usually starts with a "project charter," which defines the project objectives, desirable performances, budget, and deadlines. This process can be compared to bin Laden's "Declaration of War," which identifies specific targets. Bin Laden prefers to focus on the "Crusader–Zionist" alliance supporting and manipulating them. He argues that the "greater enemy" must be overcome the "lesser enemy" (Burke 2004). This approach is opposed to the common targets of other Islamic groups, which were focused on their own governments.

In February 1998, Osama bin Laden and four other Al Qaeda leaders issued a self-styled *fatwa*, publicly declaring that it was God's decree that every Muslim should try his utmost to kill any American, military or civilian, anywhere in the world, because of American occupation of Islam's holy places and general aggression against Muslims. All Al Qaeda's operations were part of this long-term approach.

Finally, a global plan with a wide view of the projects was always maintained and updated. Although no formal Integration tools, such as a formal project plan, were handy, this knowledge area was well covered.

Scope Management

Scope management knowledge area includes scope planning, scope definition, Work Breakdown Structure (WBS) creation, scope verification, and scope control. The program's

scope was defined by bin Laden and was focused, as stated earlier, on attacking American targets. This scope has not been changed.

In addition, each project had its own scope, which was first defined, but often changed. For example, the 9/11 operation scope definition was changed several times during the project. Ramzi's first idea included simultaneously destroying twelve passengers' jets in the air, used to be called the "Bojinka plot" (Burke 2004). The operation's initial official scope definition included ten airplanes, both in the Eastern and Western coasts of the United States. Osama bin Laden decided to limit the scope of the operation in order to increase its chances of success. At a later stage, the project included the explosions of planes both in the United States and East Asia. The scope was, once again, reduced by bin Laden in the spring of 2000. He decided it would be too difficult to simultaneously coordinate a large-scale attack on two continents. These decisions fit project management literature know-how, which proves that smaller-scale projects have much higher chances of success, compared to larger-scale projects (Johnson et al. 2001).

The implementation of scope planning process included selecting the targets to be attacked. Bin Laden wanted to destroy the White House and the Pentagon, KSM wanted to strike at the World Trade Center. All three of Al Qaeda's leaders, bin Laden, KSM, and Mohamed Atef, wanted to hit the Capitol. In the end, bin Laden decided on the destinations of the four planes, including the two planes to New York and the two to Washington, D.C.

Another managerial process included in the Scope knowledge area is developing a Work Breakdown Structure (WBS). This tool hierarchically identifies the activities to be executed during the project. It seems that this tool was not being used by Al Qaeda during any of the operations. Yet, looking back one can chart the projects' WBS. For example, the 9/11 project's WBS may have looked like as follows:

1. The Planes' Operation
    - 1.1. Project team leaders
        - 1.1.1. Western culture training in Karachi, Pakistan
        - 1.1.2. Obtaining visas to the U.S.
        - 1.1.3. Moving to the U.S.
        - 1.1.4. Learning English
        - 1.1.5. Searching for an American wife
        - 1.1.6. Pilot training
        - 1.1.7. Plane certifications
        - 1.1.8. Obtaining driver's licenses
        - 1.1.9. Purchasing plane tickets
        - 1.1.10. Purchasing small knives, GSP units, and aeronautical charts
    - 1.2. Team members
        - 1.2.1. Staff searches of local mosques
        - 1.2.2. Staff approvals, made personally by bin Ladin
        - 1.2.3. Training courses at the Mes Aynak camp in Afghanistan
        - 1.2.4. Obtaining visas to the U.S.
        - 1.2.5. Entering the U.S.
        - 1.2.6. Obtaining driver's licenses
        - 1.2.7. Gym training
        - 1.2.8. Dividing into teams according to English-speaking ability
    - 1.3. Communications
        - 1.3.1. Personal meetings with bin Ladin at the training camps
        - 1.3.2. Phone communications

1.3.3. Electronic communications (e-mails, instant messaging)
1.3.4. Communications using couriers flying to the U.S.
1.4. Intelligence
1.4.1. Finding flight schools in the U.S.
1.4.2. Flight routes and schedules
1.4.3. Security exercises
1.5. Finances
1.5.1. Raising money through funds
1.5.2. Moving money to the U.S. by cash
1.5.3. Moving money to the U.S. by bank transfers

Scope management is a very important knowledge area in the project management area. Most Western project managers plan and strictly update their project's scope. However, it seems that neither scope planning, nor configuration management processes were being performed to manage the frequent changes in the scope of Al Qaeda's operations.

Time Management

In this knowledge area the project manager has to define the project's activities, sequence them, estimate activity resources, develop, and control the schedule. Tools included in this knowledge area are: network diagrams, a Gantt chart, a schedule control system, and project management software.

Although deadlines for Al Qaeda's operations have been appointed, in many cases the operation did not meet its schedule targets and had to be rescheduled. For example, the 9/11 attacks were planned for the end of 1999, but were postponed three times, first to May 2001, then to July, and finally to September 2001, due to operational difficulties.

Once the final date of an operation was approved, a detailed schedule was planned. However, no project management tools for time development, such as the Critical Path Method or a Gantt chart, were being used. Trying to look back at the events of the 9/11 plot, may end with schedule planning, which is presented in Figure 1. The four planes were scheduled to depart within 25 minutes of each other, from 07:45 to 08:10. Because the hijacking was scheduled for 30 minutes after take-off, no kidnapping information was supposed to be revealed. Figure 1 presents the planned departure as represented by the left side of the upper rectangle, whereas hijacking planned points are represented by its right side, 30 minutes after take-off.

On 9/11, all four flights departed behind schedule. Whereas three flights were ten to fourteen minutes late, the flight, which was planned to depart last, UA93 from New Jersey, had the longest delay, 42 minutes, due to morning traffic. Hence, a schedule gap of 43 minutes was established between planes, with AA11 departing at 07:59 and UA93 departing at 08:42. The differences of the actual versus the planned departures are represented by the white (planned) and actual (gray) triangles in Figure 1.

The time gap among the flights increased even more when the AA11 team hijacked the airplane 30 minutes after *planned* departure, whereas the teams of flights UA175 and AA77 kept to the original schedule and hijacked their planes 30 minutes after *actual* departure. Moreover, the last plane to depart, UA93 from New Jersey, was hijacked only 46 minutes after its actual departure, meaning 42 minutes after AA11 had crashed into the north tower and 25 minutes after UA175 had crashed into the south tower of the World Trade Center. Figure 1 presents the first two plane crashes, represented by red stars, which happened before flight UA93 was even hijacked. The previous events created a time gap that allowed several passengers and crewmembers of UA93 to receive information about

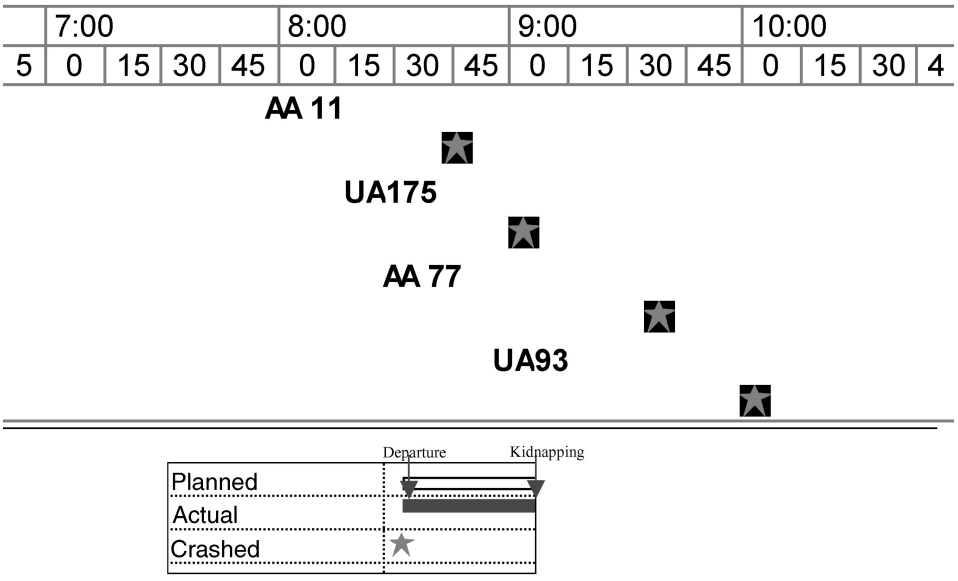

Figure 1. Planned and actual flight schedule from departure to kidnapping.

the first terror attacks. They understood that listening to the hijackers and sitting still would not bring them to safety. Finally, the fourth team could not accomplish their mission, due to passenger resistance, which caused the plane to crash in a field in Pennsylvania.

Analyzing this knowledge area, it is clear that no schedule development techniques were being used. Moreover, most operations were delayed and had to be reschedule. The failure in achieving schedule targets in the 9/11 plot may have caused the failure of the fourth plan. Hence, it can be said that time management can be defined as one of Al Qaeda's managerial weaknesses.

Cost Management

Budget was a main resource in Al Qaeda's operations. The project management literature suggest several tools to plan and control a project's budget, including time-cost trade-off analysis, total cost and project duration, which are interdependent, rescheduling of activities to change the budget profile and the associated cash flow, and crashing, which reduces activity duration by spending more money.

In most operations, budget was limited; hence, cost planning and management were required. For example, Ramzi Ahmed Yousef had to build a smaller bomb for the 1993 World Trade Center explosion, due to being short of funds (Burke 2004). According to Al Qaeda's manual, cost management includes separating the budget into two different accounts—one to be invested in projects and offer financial return and the other is to be saved and not spent except during operations (Der Spiegel Magazine 2002).

The operations' budget arrived from charities, government aid organizations, private businessmen, collections from congregations in mosques, and private donations from wealthy individuals (Burke 2004).

Cost Breakdown Structure (CBS) is one of the processes from the project management area, aimed at analyzing project's expenses. For example, the 9/11 project's cost was

estimated to be below $500,000. Analyzing the project budget, reveals that most of it, estimated at $270,000, was spent in the United States. According to the "9/11 Committee" (2004) and Mickolus and Simmons (2002), the 9/11 project's CBS is described as follows:

1. Project Cost
   1.1. Travel expenses to obtain passports and visas
   1.2. Travel expenses to the U.S.
   1.3. Expenses outside the U.S.
   1.4. Expenses within the U.S.
      1.4.1. Renting homes
      1.4.2. Funding pilots and material arts training
      1.4.3. Airfares tickets for 19 individuals
   1.5. Expenses made by people who ultimately did not participate

There is no evidence of cost estimating, budgeting, or control for Al Qaeda's operations. Considering Al Qaeda's budget and security limitations, there is huge doubt that any were made.

Quality Management

The high quality of a project can be achieved through three managerial processes: quality planning, quality assurance, and quality control. Tools included in this knowledge area are: quality audits, inspections, testing, and control charts.

The high quality of an operation's outcome was very important to the Al Qaeda's leaders. However, in some cases logistics and budget constraints damaged this target (i.e., the amount of explosive material that was used in the 1993 World Trade Center explosion). Yet, in most operations, achieving a high level of quality was the first priority.

For example, in the 9/11 plot, in order to improve the quality of the project, the amount of fuel in the planes was a critical issue to consider. All four flights that were chosen departed from the east coast of the United States (Boston, Washington, D.C., and New Jersey) and were supposed to land on the west coast (San Francisco and Los Angeles). These were the longest routes—with the largest amount of fuel on board—but still considered a domestic flight.

Quality assurance and control processes are other managerial tool to be used in a project. In order to achieve the desired level of quality, several tests were performed in the 9/11 plot to investigate airport security and project procedures. These tests were performed several times during the month prior to the attack. Testing lasted until the morning of 9/11, when Marwan al Shehhi, the leader of flight 175, flew from Portland to his starting point at Boston's Logan National Airport to reinsure security levels. In summary, most quality tools were used in Al Qaeda's operation.

Human Resources

The project human resource management section includes the analysis of (1) Al Qaeda's organizational structure, (2) team recruiting, (3) operations' Organizational Breakdown Structure (OBS), and (4) team developing. This section analyzes Al Qaeda's operations going through these four phases.

An organization's structure highly impacts the management of its projects. Al Qaeda's organizational structure is considered to be a complex one. Al Qaeda is defined as a network, rather than an organization (Raab and Milward 2003). Mcallister (2004) claims that

becoming an all-channel network was the result of poor strategy and indeterminate political goals. Lately, Mishal and Rosenthal (2005) classified Al Qaeda as neither networked nor hierarchical, but as a new typology of terrorist organizations.

Team recruiting to Al Qaeda was considered to be with high priority to bin Laden, who was sometimes personally involved. Most of Al Qaeda's operations have included several operative groups that simultaneously carry out multiple attacks in one area using one method. This approach demands complicated recruiting processes. For example, in 1993 Bin Laden sent Afghan veterans into Somalia to contact local tribes and to offer support and training. In 2000 Atta met candidates in Abu Dahbah (Der Spiegel Magazine, 2002). Christine (2004) claims that Al Qaeda likely does not have an explicit and dedicated recruiting infrastructure to recruit Pakistanis for its operations. Rather, Al Qaeda relies on a web of informal relations with groups based in Pakistan to gain access to operational collaborators and individuals to execute attacks within Pakistan.

The people who take an active part in Al Qaeda's operations come from different backgrounds in terms of education, country of origin, and extent of criminal background (Raab and Milward 2003), but they were all committed to the idea. All men in the training schools in Afghanistan did so of their own volition. Despite the tight discipline, anyone who wanted to leave was allowed to go (Burke 2004).

Staff acquisition for the 9/11 plot began with recruiting KSM, the project initiator, Mohammed Atef, chief of operations and Mohamed Atta, tactical commander. Then, four other members, belonging to bin Laden's core group, were taken on as project participants. Later, four Muslims from Hamburg, Germany were added to the team as team leaders. Finally, the recruiting process included personal acquire in mosques and Afghanistan camps. The greatest recruiting challenge, according to an interview KSM gave Al-Jazeera, was to select suitable people who were familiar with the West (Burke 2004).

Most of the project team members were from Saudi Arabia, all were young—between the ages of 20–28 years old—most were not well educated, most were unemployed and unmarried, and most spoke English poorly. Formal requirements for staffing were devotion to bin Laden, veteran service, and the ability to get a valid U.S. visa. Neither understanding Western culture nor the ability to speak English were part of these requirements.

Once recruiting project team members, the development of a hierarchical project structure is required. The 9/11 project structure was defined by the "9/11 Commission" as being "dynamic." The organization's structure seems to have been based on prior trusted contacts among its members (*New York Times*, 2001).

The Organizational Breakdown Structure (OBS) of a project defines the hierarchical structure of team members that participating in a project. Although Al Qaeda is not a hierarchical organization, complex operations, involving several groups, require a structured definition of everyone's positions. In a military organization like Al Qaeda, the chain of command is very clear. For example, the 9/11 operation was performed by a total of 19 people, who were divided into 4 groups. Each group included one pilot with a pilot's license. Three of the groups included five people, whereas the UA93 flight that crashed in Pennsylvania included only four people. Mohamad al Kahtani, who was meant to be the fifth hijacker on flight UA93, had been refused entry to the United States at Orlando International Airport in August 2001. Figure 2 charts the 9/11 project's OBS.

The last human resource management involves the development and management of the project team. Due to problems of distance and security, it was usually easier to manage the project teams separately, using the team leaders. Team leaders were responsible for mentoring and motivating their team members. This was accomplished in two ways. Firstly, religious promises were made regarding the good life waiting for them in Paradise,

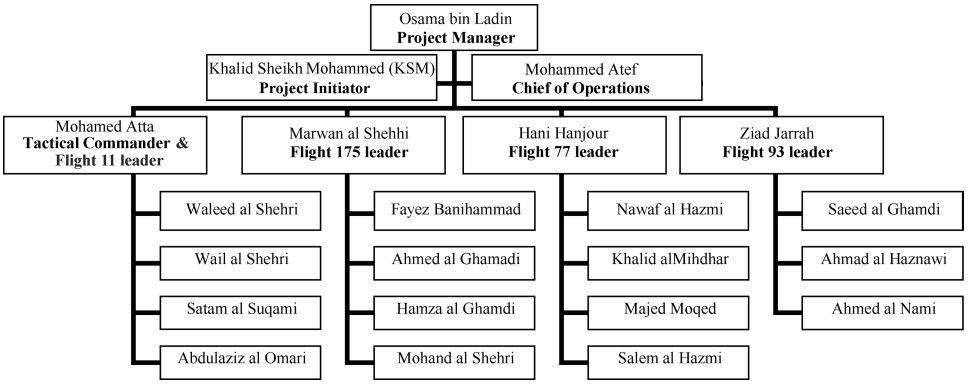

Figure 2. The 9/11 project's organizational breakdown structure.

including a personal blessing from bin Laden. Secondly, money was spent to fund their Western way of life for the few months prior to the operation.

Team developing include building a high motivated group of people working together to achieve the same objective. Bin Laden had the most motivated volunteers from the Afghanistan camps, due to his extreme ideas of attacking the United States. Highly motivated people were personally selected for the operations. Keeping motivating those people throughout the whole operations, by the life-after-death promises, resulted in dedicated team members and a very useful human resource management process.

For summary, all human resource management processes were well taken care of in Al Qaeda's operations, starting with recruiting high quality team members, continuing with arranging them in clear positions and ending with keeping them highly motivated, in many cases on their way to their own deaths.

Communications

The project management literature identifies four processes within this knowledge area, including communications planning, information distribution, performance reporting, and managing stakeholders. Tools available within this knowledge area include stakeholders' analysis and developing communications management plans.

Since the days of the war against the Soviets, bin Laden had always been actually aware of the importance of the media (Burke 2004). For example, he sent audiotapes of his lectures to be played at meetings of radicals in Pakistan gave some interviews to TV (CNN, Al-Jazeera, etc.) and paid money to selected journalists in Pakistan.

Although with security limitations, bin Laden tried to keep a large amount of communication transfer among the team members. Communications during the preparations included sending messages among project team members and the project manager. Communications included personal meetings as well, that is, bin Laden and KSM Met in the spring of 2000 in Afghanistan. However, close to the operation itself, communications among project teams were reduced to a minimum, due to security reasons. In the 9/11 plot, most of the terrorists did not know the identity of the other hijackers. Moreover, none of the hijackers, except the pilots, knew any of the planes' destinations.

Some of the communications throughout the 9/11 project were informal messages sent to Americans authorities. Bin Laden led U.S. intelligence to believe that he planned to release some prisoners from jail. Hence, the American troops were prepared to negotiate

with hijackers on hijacked planes, far away from the actual scenario they should have prepared to face. Proper use of communications skills led to the most crucial element of this operation—surprise.

Some of the communications occurred between U.S. immigration officers and the hijackers entering the United States. Although citizens' basic freedoms and rights were carefully honored in the United States, Miller (2002) claims that these security systems ensured the public increased security measures without compromising private citizens' rights.

On 11 September 2001, communications among the project teams were fluent. On 9/11 at 06:52, Mohamed Atta, the leader of Flight 11, called Marwan al Shehhi, the leader of Flight 175 for the operation's final confirmation, only minutes after his earlier flight from Portland landed in Boston.

Finally, despite partial information distribution capabilities, Al Qaeda used more communications channels than most project managers in the Western world, which are not even limited by security constraints.

Risk Management

Risk management processes aimed at reducing the level of the project's risk. These processes include: risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, and risk monitoring and control. Tools included in this knowledge area are: planning meetings, risk rating, and risk control.

One of the major risks of Al Qaeda's operations was an early warning from the American forces that would cancel the operation. One solution was preparing alternative options. For example for the 9/11 project, the alternative plan included Southeast Asia (Thailand, Singapore, and Indonesia) and Jewish targets in New York. Another solution was checking the intelligence alerts on the day of the operation itself, just hours before the operation began. In the 9/11 project, Atta and Omari, who were part of American Airlines' Flight 11, scheduled to depart from Boston's Logan International Airport at 07:45, boarded a 06:00 flight from Portland to Boston. In doing so, they would be able to cancel the operation in case U.S. officials arrested them.

The risk of identifying weapons required for plane hijacking in security checkpoints before boarding was also considered and resolved. The biggest stroke of genius in this terrorist operation was that no weapons were required—the plane itself was the weapon, specifically its energy and fuel tanks. The minor weapons used were mace and pepper, which can not be detected by a walk-through metal detector.

Another risk was that the hijackers would be apprehended by some passengers on the plane on their way to the cockpit. Hence, all tickets were booked in first or business class, near the aisles. Moreover, all team members underwent physical training before the operation took place.

During the operation's preparation phase, the main risk was that one of the team members would be discovered and detained. This event could have caused the failure of the entire operation and led to the capture of its leaders. Krebs (2001) described some of the techniques used by the team leaders to prevent this risk from happening and how they planned to reduce the damage, should it occur.

Although American intelligence had no knowledge of the 9/11 project plan, an identified risk was the similar dates between project preparations at the end of 1999 and the huge Millennium Celebration, scheduled to tale place in the United States. At the end of 1999, security checks in U.S. airports were high; this was the period when some

of the hijackers intended entering the United States in order to obtain pilot licenses and drivers' licenses, hence no entries to the United States were attempted in 1999. The first hijacker arrived at the Los Angeles International Airport on January 15, 2000. Since that date, hijackers successfully entered the United States 33 times.

However, one risk was not properly dealt with in the 9/11 project, which served to damage the operation. Morning flights from Newark airport usually depart late due to morning traffic. This information was available on several websites. Flight UA93 from New Jersey, scheduled to depart at 08:00 was 42 minutes late. Moreover, this plane was hijacked only 46 minutes after departure, instead of 30 minutes, as planned. This meant that although the plane was hijacked at 09:28, most passengers and flight attendants who called their families heard about the two airplanes crashing into the World Trade Center. This significant knowledge on the part of the passengers ended with a failed attempt to crash the plane into the White House. The plane finally crashed in a field in Pennsylvania due to violent resistance on the part of the passengers and crew.

A calculated risk taken by the project manager was in not delaying the 9/11 operation, although only 19 hijackers had managed to enter the United States. Mohammad al Kahtani, who was supposed to be the twentieth hijacker, had been refused entry to the United States in August 2001. This decision eventually allowed the passengers of Flight 93 to attack the four hijackers on board.

On 16 August 2001, three weeks before the operation, Moussaoui, who was planning to take part in the operation, was arrested by the INS on immigration charges. Communicating with the project leaders and reporting to them about the scenario could have damaged the operation. The decision taken was negligent. None of the project leaders knew of the arrest prior to 9/11.

Finally, although not using project risk management tools, most major risks were identified and taken care of. In some cases, when the level of risk was low, calculated risks were taken, just as the project management literature suggests. Yet, as happens in many projects, some risk events were not being taken care of. In the 9/11 project, this may have led to the fourth's plane unsuccessful attack.

Procurement Management

Procurement management involves third parties in the project. Processes within this knowledge area include: plan purchases and acquisitions, plan contracting, requesting seller responses, selecting sellers, contract administration, and contract closure. Tools included in this knowledge area are: make-or-buy analysis, contract negotiation, and procurement audits.

Table 2
The 9/11 project's external suppliers

#	Supplier	Purpose
1.	U.S. government	Visas to the USA
2.	U.S. government	Drivers' licenses
3.	Training schools	Pilot licenses
4.	Private American citizens	House rentals
5.	Travel agencies	Airplane tickets

The projects teams were dependent on numerous external suppliers to fulfill the operations' many needs. For example, the list of external suppliers involved in the 9/11 project is presented in Table 2.

Table 2 presents the high dependency of the project team on external suppliers. The team had no way of avoiding these contacts, although this increased their risk of exposure. Looking back, minimal contact was made, ending with the achievement of the desired outcomes, without increasing the level of risk.

Conclusions

In most Western organizations, project managers are requested to pay a high level of attention to time and cost management (Zwikael and Globerson 2004). This sometimes derives from project management software and customers' priority that focuses on these areas. Al Qaeda, not having project management software and not caring much about project budget, did not perform all the relevant project processes included in the project management "Time" and "Cost" knowledge areas. It is assumed that cost management processes were not formally planned, documented, and controlled due to security reasons. It may also be assumed that schedule delays may have been reduced if Al Qaeda had used project management time management tools and techniques.

On the other hand, project managers in Western cultures pay less attention to knowledge areas, such as communications and human resources management. The main reason for this is insufficient know-how in these areas and a lack of user-friendly tools. Yet these knowledge areas have the greatest influence on project success. This study found that Al Qaeda focused on these knowledge areas and performed the relevant processes in accordance with project management methodologies. It included the processes of team members recruiting, developing a clear organizational structure, team developing, and team members' motivation. Hence, unlike Western organizations, Al Qaeda's project management strengths in human resources and communications management are aligned with the areas that are most valuable to project success.

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