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Systemization & Survival – “Houston, we have a Problem” – Business Lessons from Apollo 13

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Film Overview

The Apollo 13 movie is a dramatic presentation of the actual events as the Apollo 13 mission to the moon unfolded. The three astronauts Jim Lovell, Fred Haise, and Jack Swigert had their roles very dramatically acted out by Tom Hanks, Bill Paxton, and Kevin Bacon respectively. This was the seventh crewed mission in the Apollo space program and the third attempt by National Aeronautics and Space Administration (NASA) to land a man on the moon.

In the movie, as it was in the real-life mission, the launch was successful, the team took off and left the earth's orbit as planned. The team to take the Apollo 13 spacecraft to the moon had been carefully selected and placed under relevant medical tests and severe trainings to assess their suitability of going to space. During preparation, and just two days before the actual launch, different teams went to their respective places in the spacecraft and the mission control room for the last time to test the spacecraft and the running codes. These scenes are well acted in the movie where the team in the mission control room is seen surrounded by computers, their code files, and books.

During the Apollo 13 spacecraft launch on 11 April 1970, everything moved like clockwork and all systems performed smoothly as expected during lift off. It was all smooth up to 322,000 kilometers from earth. A routine stirring of the service module's oxygen tanks led to a short circuit, which then led to the explosion of one of the tanks. The crew promptly notified the mission control of this incident, with Swigert's utterance developing into the infamous quote, "Houston, we have a problem". This set off a major crisis triggering a series of events, decisions, actions, and conversations where the teamwork, systems, skills of both the astronauts in space and the mission control team in Houston were severely tested.

The lead flight director Gene Kranz and the mission commander Jim Lovell had their leadership and management skills severely tested as the mission evolved from a moon landing to the delicate task of getting the astronauts back to earth alive using the lunar module named Aquarius.

This monumental event started off with just an alarm from one of the five buttons, button number 5 going off. After checking their code files, one of the members from mission control room reassured the teams that everything "will be alright as long as we don't lose another one". After this small incident, everything seemed to be calm, and the flight continued. The

teams were in constant communication and updates. They discussed and consented every time before making any decision. As one of the crew stirred the oxygen tank as requested by mission control, the oxygen tank exploded, the master alarm went off and the escaping gas pressure caused a few pipes to disconnect. Many other alarms followed suite and started to go off and it seemed like they were having a “quadruple failure”. Jim Lovell thereafter notified the control room that “we are venting something out in the space I can see it outside the window 1, it is definitely a gas or some sort, it’s got to be the oxygen”. Gene swung into action immediately and ordered all support teams to be alerted. As they were frantically debating the available options, Gene kept them in check with his infamous command “work the problem and let’s not make things worse by guessing”. Each section in the control room went to their computers and notebooks to check and verify every system in the Apollo 13 spacecraft along the line of existing procedures (systems/prototype) with one other and the astronauts in the spacecraft.

The survival of the astronauts and their safe return to earth were under serious threat. It required everyone in both of the teams to give it their best shot as the near catastrophic developments demanded split second decisions be made continuously.

The teams started exploring all possible options. The mission to land on the moon was also considered and ruled out as unsafe and was subsequently cancelled. At that point all teams shifted their focus on the new mission “how to get our people home” and started to explore all possibilities for a safe return of the entire crew back to earth.

Ken Mattingly who was originally scheduled to fly Apollo 13 but was grounded for medical reasons was brought in to support the mission control team that was racing against time to bring back the astronauts from the damaged spacecraft back to earth. Ken conducted another simulation at mission control, taking on board all the things available on the Apollo 13 and asked the team at the control room to create “exactly the same condition they got there now”. Based on their experience with many other simulations conducted before the launch to anticipate faults that could have happened to Apollo 13, the mission control team was able to figure out a solution. Although the lunar landing mission was not accomplished, a solution was finally found, and the astronauts were brought back to earth safely.

The Film’s Main Theme: Apollo 13 as a Risk Management Event

The movie Apollo 13 provides several examples that highlight the importance of risk management in the context of space exploration. Here

are some key aspects of risk management that were demonstrated in the movie:

Risk Identification

In the movie, the explosion of an oxygen tank aboard the Apollo 13 spacecraft was an unforeseen event that introduced significant risks to the mission. The incident highlighted the importance of identifying potential risks and understanding their potential impact on the mission's success. Risk identification involves assessing various factors, such as technical malfunctions, human error, and external factors, to proactively identify potential hazards and mitigate them.

Contingency Planning

Following the oxygen tank explosion, the NASA team had to quickly develop contingency plans to address the emerging risks and ensure the safe return of the astronauts. This involved analyzing the available resources and finding innovative solutions to sustain life support systems and navigate the spacecraft back to Earth. Contingency planning is a critical aspect of risk management, enabling organizations to prepare for unexpected events and develop alternative strategies to mitigate the impact of those events.

Collaboration and Decision Making

Risk management often requires effective collaboration and decision-making among various stakeholders. In the movie, NASA's engineers, flight controllers, and astronauts worked together to analyze the risks, brainstorm solutions, and make critical decisions. Risk management involves bringing together multidisciplinary teams, leveraging their expertise, and fostering open communication to ensure informed decision-making in high-pressure situations.

Monitoring and Mitigation

Throughout the movie, the NASA team continuously monitored the situation, assessed risks, and implemented mitigation strategies. They meticulously tracked vital resources such as power, water, and oxygen to optimize their usage and extend their availability until the astronauts' safe return. Monitoring and mitigation involve regularly assessing risks, implementing controls, and adjusting plans as new information becomes available to minimize the potential impact of identified risks.

Learning from Failure

The Apollo 13 mission taught valuable lessons about risk management and the importance of learning from failure. After the mission, NASA conducted extensive investigations to understand the causes of the oxygen tank

explosion and implemented corrective actions to prevent similar incidents in the future. Risk management involves a continuous learning process where organizations analyze failures, update risk assessment strategies, and improve processes to enhance safety and success in future endeavors.

The movie Apollo 13 showcases the significance of risk management in a high-stakes, complex mission. It highlights the need for proactive risk identification, contingency planning, collaboration, decision-making, monitoring, mitigation, and learning from failure. By effectively managing risks, organizations can enhance their ability to anticipate and respond to challenges, ultimately improving the overall success and safety of their endeavors.

Systemization as a Business Process Management

Business Process Management (BPM) is a discipline that focuses on optimizing and improving the efficiency of an organization's processes to achieve better outcomes. It involves analyzing, designing, implementing, and continuously monitoring and optimizing processes to enhance productivity and customer satisfaction.

The incidents from the Apollo 13 movie demonstrate the importance of BPM in managing complex and high-stakes situations. The mission control team's ability to analyze, design, implement, monitor, and optimize processes was vital in overcoming the crisis and achieving a successful outcome. Their collaboration, communication, problem-solving, and decision-making skills highlight the key aspects of BPM in action.

Process Analysis and Design

When the oxygen tank explodes, the mission control team at NASA faces the challenge of quickly assessing the situation and developing a plan to bring the astronauts back safely. They analyze the available resources, capabilities, and constraints to design a new process to overcome the crisis. They collaborate, brainstorm ideas, and evaluate alternative options to develop a viable plan.

Process Implementation

Once the plan is designed, the mission control team works together to implement the new process. They allocate roles and responsibilities, assign tasks, and coordinate activities to ensure a smooth execution. The team members communicate effectively, exchange information, and monitor progress to keep everyone aligned and informed.

Process Monitoring and Optimization

Throughout the crisis, the mission control team continuously monitors the progress and adjusts the plan as needed. They collect data, analyze performance metrics, and make data-driven decisions to optimize the process. They adapt to the changing circumstances, consider feedback from the astronauts, and modify the plan to increase the chances of a successful outcome.

Valuable Insights from Apollo 13

Apollo 13 provides a compelling example of the impact of systems in business development. While the movie primarily focuses on the space mission and its challenges, it offers valuable insights into how systems thinking and problem-solving are essential for successful business development.

Interconnectedness and Integration

In Apollo 13, the crew faces a life-threatening crisis when an oxygen tank explodes, jeopardizing their return to Earth. The incident highlights the interconnectedness of various systems in space exploration. Similarly, in business development, various departments, processes, and stakeholders are interconnected and need to work in harmony for success. Effective integration of different systems, such as marketing, operations, finance, and human resources, is crucial for achieving business objectives.

Problem-Solving and Adaptability

The crew of Apollo 13, along with mission control on Earth, demonstrates exceptional problem-solving skills and adaptability when confronted with unexpected challenges. They quickly analyze the situation, assess available resources, and devise innovative solutions to overcome the obstacles. Similarly, in business development, unexpected hurdles can arise, requiring teams to think creatively and adapt their strategies to navigate through difficulties.

Communication and Collaboration

Effective communication and collaboration play a pivotal role in the successful resolution of the crisis in Apollo 13. The astronauts and mission control work together, exchanging vital information and coordinating efforts to ensure the safe return of the crew. Similarly, in business development, effective communication and collaboration between teams, departments, and stakeholders are essential for aligning goals, sharing knowledge, and making informed decisions.

Contingency Planning and Risk Management

In the movie, both the crew and mission control engage in contingency planning and risk management to mitigate the potential dangers posed by the damaged spacecraft. They carefully evaluate available resources, explore alternative options, and make calculated decisions to optimize their chances of success. Similarly, in business development, organizations must identify and assess potential risks, develop contingency plans, and proactively manage uncertainties to minimize negative impacts and maximize opportunities.

Continuous Learning and Improvement

Throughout Apollo 13, the crew and mission control constantly learn from their experiences, analyze failures, and use feedback to improve their processes. They reflect on their actions and implement changes to enhance future missions. In business development, a culture of continuous learning and improvement is crucial. Organizations must embrace feedback, analyze their performance, and make necessary adjustments to enhance their operations, products, and services.

The movie Apollo 13 underscores the significance of systems thinking, problem-solving, collaboration, adaptability, and continuous improvement in both space exploration and business development. By understanding the interconnectedness of various elements, proactively managing risks, fostering effective communication, and embracing a learning mindset, businesses can navigate challenges, optimize their operations, and achieve their goals.

Lessons Learnt from Apollo 13: The Impact of Systems in Business Development

The incidents portrayed in the Apollo 13 movie demonstrate the importance of robust systems, collaboration, adaptability, and training in business development. By incorporating these principles into their operations, businesses can enhance their ability to navigate challenges, seize opportunities, and achieve long-term success.

Risk assessment and mitigation strategies

In the movie, the explosion of an oxygen tank onboard Apollo 13 leads to a critical situation for the astronauts. This incident highlights the importance of robust systems and processes in business development. The oxygen tank failure was ultimately traced back to a faulty component, highlighting the need for thorough quality control and testing procedures. In business, similar incidents can occur if systems are not well-designed, tested, and

monitored. It emphasizes the importance of risk assessment and mitigation strategies to prevent catastrophic failures.

Collaborative problem-solving

After the oxygen tank explosion, the mission control team at NASA and the astronauts on Apollo 13 had to work together to solve a series of complex problems. They had to devise innovative solutions using the limited resources available. This incident demonstrates the significance of collaboration and effective communication within a business development context. It underscores the importance of having well-defined systems for collaboration, decision-making, and problem-solving (Kalogiannidis 2020), as well as the ability to adapt and think creatively in high-pressure situations.

Adapting to change

The Apollo 13 mission had to be completely redefined after the oxygen tank failure. The original objective of landing on the moon had to be abandoned, and the focus shifted to the safe return of the astronauts. This incident highlights the need for flexibility and adaptability in business development. In a rapidly changing business environment, organizations must be able to adjust their strategies and objectives based on unforeseen circumstances or market conditions as pointed out by Zhang, Fong and Agyemang (2021). Having systems in place that allow for quick decision-making and agility is crucial for continued success.

Importance of training and preparation

The Apollo 13 crew's training and preparation played a critical role in their ability to handle the crisis effectively. The rigorous training they underwent equipped them with the necessary skills and knowledge to troubleshoot problems and make critical decisions under extreme conditions. This incident underscores the significance of investing in employee training and development in the context of business development. Well-trained and prepared employees are better equipped to handle unexpected challenges, adapt to new situations, and contribute to the growth and success of the organization (Ferrara and Lecce 2019).

Identifying the real problem

In the movie, NASA faces a life-threatening crisis when an oxygen tank explodes on the spacecraft, jeopardizing the lives of the astronauts on board. When the explosion occurred, the team at Mission Control initially assumed that it was a routine electrical problem. However, Gene Kranz, the lead flight director, challenged this assumption and insisted on performing a thorough root cause analysis to understand the true nature of the problem. They quickly realized that it was not just an electrical issue but a

catastrophic failure in the oxygen tank. They also realized that the problem was not just the damaged tank itself but the fact that it impacted critical systems on the spacecraft. By identifying the real problem as a combination of power loss, loss of life-support systems, and dwindling resources, NASA could focus on optimizing the available resources to ensure the astronauts' survival.

This approach to identifying and solving problems highlights the critical importance of identifying the real problem in business development so that organizations can implement targeted solutions, foster collaboration amongst diverse teams, adapt to changing circumstances, and facilitate effective communication and decision-making. Addressing the root cause of issues enables businesses to achieve their objectives efficiently and successfully overcome challenges.

Business Simulation

Digital business simulation can be tailor made to specific company objectives as business simulation tools now available which can enable stakeholders to explore strategic changes scenarios before they happen. As this was the case in Apollo 13, simulation tools can help business managers to know the “what, why, and how” of problems even before the problems occur (Anand and Barsoux 2017). Some reviews (e.g., The Guardian 2014) later revealed that the NASA mission control team at Houston managed to find the solution quickly due to the numerous simulations which were done during the preparation phase prior to the launching.

The two exceptional team leaders did not disappoint as their behavior and actions demonstrated the most progressive management principles such as importance of planning and preparation, effective communication, flexibility and adaptability, effective leadership, teamwork and collaboration, learning from failure, innovation and creativity, robust procedures and protocols, and resource management, which are lacking in many business managers today.

To conclude, this drama demonstrates the validation and application of key business management principles and systems such as visioning, planning, team management, delegation, crisis management, prototyping, systemization, and process documentation.

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