

URGENT

**OPERATION
BLUE BREACH**





PREFACE

Storytelling is a powerful tool that allows us to envision how innovative technologies could be employed and operationalized in a future operational environment. Through the Science Fiction Writing Contest, the US Army collects stories about future land warfare to get inspired for developing new concepts.

I entered the 2019 competition with the story below. Although I did not win the competition, I think it is still an interesting view on how modern technologies may interact with human soldiers in a future urban operation. Now that the competition is closed, am I allowed to share it with you.

This story is about a hypothetical amphibious initial entry operation in the urban environment of a city of the imaginary nation of Otso in the year 2030.

Enjoy,

Air Force Major Patrick VAN HOESERLANDE
Concept Developer
Office: +1 757-747-3621
Email: Patrick.vanhoeserlande@act.nato.int

THE OTSONIAN COAST

ANNO 2030

“The life of a soldier is about getting ready early to wait. Why can’t we go in?” Master Sergeant Patrick ‘Pat’ O’Neill of the Army’s Second Special Reconnaissance ‘the Smart Two’ squad knew the answer to that question all too well. He knew that the synchronization of a military operation was essential for success, but that did not mean he had to like it. He was not the type to wait in silence. He was a man of action. Pat had Irish roots although his figure would not tell you that. His black hair and even darker eyes were enough to impress everyone he met. He was a country boy and liked his job more than anything else. He was married to his unit and had no intention to change that anytime soon. He loved the relentless exercises and the pop-up action, but was also interested in working with the latest military gadgets. ‘Gadgets’, that is how he called the robotic members of the squad.

The whole squad was waiting in the submersible, ready to navigate through the minefield and go ashore. First, the route through the mines had to be secured. Although, the war had officially started a few days ago on March 17th, Saint-Patrick’s day of all days, when the wealthy country of Donovia, after months of strained relations and covert hostilities, invaded neighboring country Otso, the United States had been preparing this contingency for months. Due to treaty obligations and historical ties, his country would be compelled to intervene and help their close ally. Everybody had agreed that it was better to be prepared than to be surprised. All understood that this would not necessary be a skirmish and had the potential to turn into a full-scale war against a near-peer competitor. The first in over 80 years and the stakes were high. They would do their part, after the waiting.

He was looking through his eye lenses to his surroundings. Although he was sitting in the driver seat of the underwater, modular squad vehicle, he only saw his squad leader and the hardware necessary to execute the job at hand. All as if the protective hull was not there. The information he needed to control the vehicle was projected onto his eye. Body sensors connected to the internal artificial intelligence software detected his wishes and reacted to them so fast that he sometimes thought the system knew what he wanted before he did.

Vera Brown, his squad leader, was sitting behind him, half asleep. She was not a talkative woman and met his complaints with silence. The use of lightweight exoskeletons had done away with any gender specific difference in force and endurance. High physical fitness was now only one of the elements of a holistic approach to overall health and not a marked advantage of a soldier. The exoskeleton was more like an armored suit filled with intelligent sensors that reacted to

brain impulses, blood pressure, blood chemistry ... and changes in the external environment.

They were the only humans in 'Smart Two'; the rest were autonomous systems, robots. There were four more squads like theirs waiting for the start of the operations. It would be the first time that these integrated man-machine squads were employed. Every squad was identical, and all had been training for almost two years. All members, humans and robots, went through different tactical situations collectively learning how to react to each other. At the start, the machines were learning slowly. The human soldiers had to go several times through the same tactical settings while trying to act in a similar way on every repetition. Those were boring weeks.



During the soldiers' debriefs the machines were exchanging what they had learned quickening the pace of learning with every iteration. In the second month, the number of dull repetitions started to drop and by month three things were going fast. Soon thereafter, the scenarios did not change much over times, but the soldiers could improve their tactics while the machines proactively adapted their actions. Six months later, they were ready to take the next step: ever-changing situations. By now, the humans were the ones limiting the speed of learning. Luckily, 'gadgets' do not get bored as easily as humans.

A few months later, the training sessions moved to real terrain situations integrated into 'normal' military exercises. The teams performed better than expected. Thanks to their performance in the field exercises and a successful small intervention of opportunity, they would soon be battletested as the spearhead of operation 'BLUE BREACH'.

“IFS. Set. Members.” Pat went over the checklist one final time. The IFS, short for Identification of Friendly Submarines, made sure that the small submergible would not be destroyed by friendly sea mines. It would be hard to navigate through the adversary’s minefield but being stopped by one’s own devices would be plain stupid. His vision changed so he could check the rest of the squad.

The indicators for the Zulu were all in the green. A carrier just before going on land would release Zulu, the biggest of autonomous systems and the vehicle they were in. It would cover the squads’ approach on land by a screen of active camouflage in the visual and infrared spectrum. This made them nearly undetectable, certainly in low light conditions. For that reason, they would hit the dirt just before the first rays of sun. Zulu was also their heavy weapon support armed with a heavy railgun, six missiles and two tethered, armed, aerial drones.



Charles and Chuck reported “everything fine” after running their self-diagnosis software. They had given the two Charlies each a name because these were the close protection robots and, being the only quadrupeds in the squad, they looked like pets. Charles was his and Chuck Vera’s, named after her dog that died days before the start of the program. They worked closely with the C’s, almost daily. Training the man-machine interface was the hardest part, but now they formed a real team ‘intuitively knowing’ what the others would do in almost every situation, even if covered in the fog of war. Thanks to the interpretative power of the suit, they worked better as a team. They performed even better than the best human-only teams. Combat simulations had proven that.

The status of the two Alphas and Bravos lit up green too. These small, multipurpose platforms with an adaptable undercarriage were the armed recce robots of the squad. The Alphas had a rifle, a grenade launcher and two mini-drones, Hummingbirds, as main weapons, while the Bravos were equipped with a small gun and two mini ground vehicles, called Mice. They worked together as a swarm clearing the way for the rest of the squad.

Behind the eight of them would follow two Kilos. These unmanned vehicles were a bit heavier with an adaptable ammunition gun, a grenade launcher and a microwave emitter. They not only served as back-up and rear protection, but also as forward logistics suppliers.

The concept of employment of the squad was built around five bubbles. The first consisted of the human soldier protected by the intelligent exoskeleton suit.

This combination was a formidable weapon already successfully used in a stand-alone mode but supplementing it with a Charlie opened enormous potential. This human-machine combination extended a soldier's reach and security, and formed the second bubble. While the Charlie did most of the shooting, the soldier took care of the problem solving and human interaction. Robots-only teams did a good job in open terrain against other unmanned systems, but when operating in urban environments, they lacked the skills human take for granted. Integrated combinations remained the better solution.

At the third level, two soldier-Charlie pairs were connected to form a combat team. Two was the optimum for social interactions.

The next level was the complete squad with a recce swarm, a combat team, a rear support and a heavy fire support.

The last bubble protected the squad by means of a heavy aircraft or airship in a high pattern loaded with flexible bombs able to deliver the extra punch of firepower on request and, if necessary, in automated defense. This layer could be enhanced by naval fire support, artillery...

"Check."

Pat saw an underwater drone passing by. He turned to wake Vera but saw that it was not necessary. She was following the drone too.

"It will start soon," she replied to his movement.

"Yes, the waiting is over," he answered.

THE BUILDING

The Zulu lifted from the seabed and started to move in what felt like a random path towards the coast, but they knew better. They followed a precisely calculated route to minimize the risk of triggering a mine or warning a sensor. Although they could not see them, the mine countermeasure underwater vehicles would be busy rechecking the corridor they were using now and that would lead them to their landing spot. One mistake would jeopardize their mission.

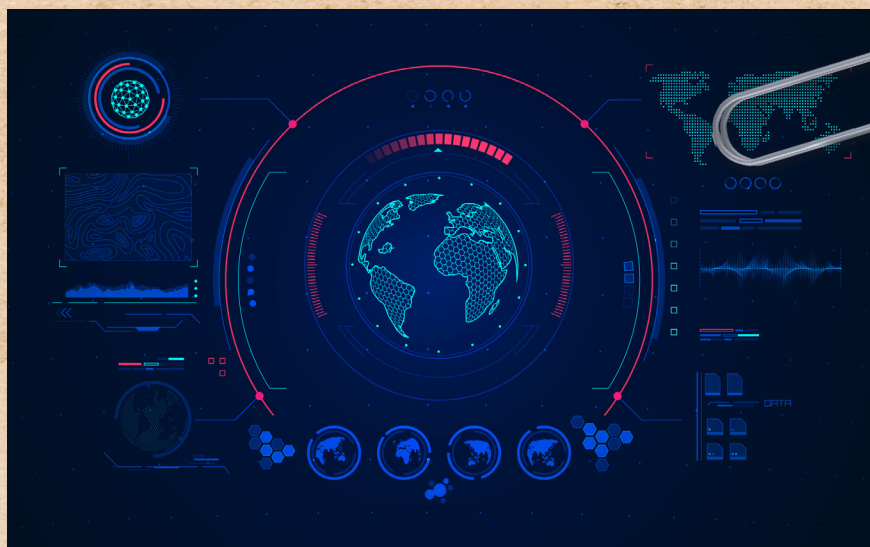
"It always seems longer than it really is," said Pat watching the time passing by while the Zulu was floating down to the bottom again. With a little shudder, the carrier that brought them safely to their entry point released their submergible and took off to its waiting point. No use in giving away information about a possible exfiltration point.

"Let's go," said Vera. Simply thinking about it was enough to give the order to move, but old habits die-hard.

A few seconds later, the Zulu gently broke the water surface and activated the active camouflage. The real time visual data provided by intelligence gathering mini-drones dropped a few days earlier by a high-altitude aerial vehicle strongly improved the quality of the camouflage. The two human soldiers in the Zulu could not see themselves moving towards the objective although they knew they were there. It was a strange feeling to look at a screen seeing nothing while physically being there. Even the microphones did not pick up any disturbance.

The moment the squad would dismount was critical. For a short period, the squad





vehicle would be visible. The Kilos had already left. Their exit maneuver hidden by obstacles on the way. Next, the two C's would crawl out and enter the building, directly followed by the two recce pairs. If no signs of danger, the soldiers would join the rest of the squad. They had exercised this exit-entry maneuver countless times. All went well as exercised. No surprises.

The building stood isolated on a big parking lot used by yacht owners with boats in the marina. That open space was selected as one of the possible areas to bring more troops ashore, therefore their first mission was to clear and secure the building with as little noise as possible and preferable without collateral damage. Unfortunately, the small intelligence drones surveilling the building showed that a group of civilians and four enemy soldiers occupied it. Civilians could be 'persuaded' by agents or by using a low yield microwave emitter, but that could warn the military occupiers that something was up. Besides overlooking the open area, the building also gave access to a tunnel that could take the squad covertly to their next objective. There had to be one, because there was no intelligence that the soldiers ever entered or left the building, while at least one of them was spotted somewhere else in the city.

Mini-drones from the Alphas were already flying in the building to complete the local multispectral picture. The Kilos had positioned them as to make sure that nobody would unintentionally move towards the building. Alpha One soon reported the whereabouts of two enemy soldiers. They were in a room together with the civilians. Bravo One proposed to send a Mouse to get a better layout of the room. Vera agreed and signaled Pat that she would take care of this situation.

His job was to find the other two.

The plan was quickly drawn up. Chuck would bust the door open while Vera would shoot with rounds that inflated like a balloon just before impact. These would knock down every civilian she hit without wounding or killing the victim. Her Alpha and Bravo would shoot with armor piercing bullets at the two enemies. The video stream showed that they had protective suits on. It was more acceptable that robots shot at soldiers than at non-combatants. The plan was flawlessly executed and over in a blink of an eye.

While Vera was checking and calming down the civilians, Chuck secured the place. There were still two out there, and maybe more.

Pat had a funny feeling about the room behind the next door. Although the streaming provided by his Mouse did not reveal anything special, his guts told him something was wrong. There was something odd about the shape of that room. The real time data told that there were four solid walls and no heartbeat detected. He requested his Bravo to enter the room and shoot at the opposite wall with a bullet set on exploding after entry. Almost directly, after the shot had torn the active camouflage net into pieces, a firefight broke out. Nothing that his recce team could not take care of. Number three was down.



When Pat entered the room, he saw one less problem to worry about. Top floor cleared. The roof presented no danger according to the images received. Vera signaled that the first floor was secured. She did not have to tell him that because he had already saw it on the after-action feed.

The Zulu warned them that an unmanned vehicle was approaching their position and requested to release its tethered drone to have a better look. Vera agreed with it and gave the permission to neutralize the vehicle if it came within the predefined range. Almost immediately, the drone unhooked itself and indirectly approached the incoming vehicle. At the same time, Kilo One followed riding towards a firing position that would not give away the squad's objective. Kilo Two moved too to make sure to cover the gap opened by Kilo One. The Zulu's second helicopter drone took off to guard the outer perimeter. All that was executed without intervention by the human soldiers who were moving downstairs.

Number four had to be near the entrance of the tunnel. Sunlight was entering the building, but down there everything was dark. Not that it mattered. The Hummingbirds were in a small-scale aerial fight, which meant that the other side was using drones too. They had to move fast now because number four knew there were coming, and the approaching vehicle could be the signal for incoming reinforcements.

Suddenly the fourth soldier appeared firing a volley at Vera. Her suit reacted to the flash, but she was just too slow to prevent being hit. Lucky for her Chuck was not human and equipped with superior mechanical reflexes. As soon as he detected the shot, it fired off a disk in the trajectory of the incoming projectiles. That was enough to prevent a direct hit and to slow down the projectiles' speed. Her Alpha and Beta both reacted by returning fire and eliminating the shooter.

Without a word Pat knew what had happened and that all had turned out fine. He was also informed that the helicopter drone had guided the Kilo One via an indirect route to an optimal shooting position. The enemy vehicle was identified as a RECON, a lightly armed reconnaissance ground vehicle. Although fully autonomous, it would have been in contact with the team that had sent it on patrol, and it was to be expected that even its destruction could not prevent it from alerting them of the danger. The only way to delay a reaction was not to give away the current location of the squad by an indirect approach. Once Kilo One was in position, the aerial drone handed over the target. A single burst disabled the recon vehicle. Pat was informed about the confirmed destruction of the RECON.

THE TUNNEL

While the soldiers searched for the entrance to the tunnel, the Zulu circumvented the building to a more forward position. Its task was now to alert and defend the landing zone against the expected attack from an advanced position. The Kilos were in a supporting role until the first regular troops came ashore. After that, they would follow the rest of the squad through the tunnels protecting the rear. The Zulu was too big to enter the building and make it to the tunnel. It would navigate through the city ready to support the squad on its second objective; 'just-on-time', so as not to alarm the adversary.

Vera was checking with the squad about finding the entrance, but all reported that nothing indicated an easy access. There should be one, but apparently, the enemy had done a great job at concealing it. In the meantime, Pat had found a spot above the tunnel with Charlie's sonar and was preparing to blow a hole in the ground. Just before igniting the charge, all members were warned, and Vera confirmed the action. There was no use in getting a confirmation from the rest; no doubt that they were aware of it.

Almost without a bang, a big chunk of floor dropped in the tunnel directly followed by a Hummingbird. After a quick scan, Alpha Two went into the hole falling two meters down. Barely touching the floor, it leaped forward. Bravo Two imitated the action and disappeared out of sight. The moment Pat jumped in, Alpha Two reported that 200 meters further the tunnel was flooded. That was a complication because water degraded the performance of the sensors and could be used to conceal booby traps. It could also indicate that the tunnel was no longer functional.

Vera proposed a change in the configuration of the squad, supported by Pat. Together with Charlie, he backtracked into the tunnel to make room for Alpha and Bravo One to pass. They would dive into the water to make sure all was safe. Alpha and Bravo Two would follow providing a communication link with the rest of the squad and securing the exit at the end of the flooding. Once all in the water, the two recce teams cooperated immediately without loss of movement.

The first regular Army troops came ashore and started to secure the open space and the direct vicinity. The Zulu signaled it would start its move. The two Kilos reported that they were linked up with the amphibious forces and ready to follow as soon as the order was given. First, Vera made sure that the first unit ashore would take care of the civilians in the building. Then, she instructed the Kilos to wait for the Mouse that she had left with the civilians and to follow them as soon as she hit the water.



Alpha One confirmed that they had reached the end of the flooded section and that they had found and neutralized a booby-trap. That was the signal for Pat and Charlie to get in the water. Charlie was rigged with a waterjet strong enough to propel the two of them. Pat breathed from a device that extracted oxygen from the water. The dive went smoothly and when they exited the water, Pat saw that both their recce teams had already moved forward. When they passed Team One, he saw that they had secured a side tunnel. This confirmed the information they had sent, but he liked to check it for himself. His screen flashed to the image of an empty tunnel provided by a Mouse.

“They will do just fine.” It was the voice of Vera in his helmet. He was surprised to hear her, but she must have picked up his worrying thoughts about the landing force. It was sometimes scary to be reminded that the interface was sophisticated enough that it could translate feelings and thoughts outside the tactical scope.

“Don’t worry about it. You know it happens to me too.”

“Thanks.”

Back to business. The move through the tunnels was as planned: quick and dull. He felt a bit relaxed. A few years ago, you could not allow your guard down, because you had to stay sharp so as not to be surprised. Now, as a human you could relax a bit in the lull of a fight because the other members were always 100 % alert. The bubble concept gave you ample warning time. He was wondering if the Zulu would make it in time. Its extra firepower would surely be welcome, but its most recent status update was when the last Kilo entered the tunnel. He hoped it did not run into some trouble stopping it from meeting them.

THE CITY

Alpha Two reported they had reached the end of the tunnel, but the exit was blocked by debris. Blowing a hole through it could alert nearby enemy troops or trigger sensors, so Vera and Pat decided to use Charlie to clear the debris. First, it made an opening big enough to let through a Mouse and a Hummingbird. After exiting these two assessed the situation and reported to the squad. In the meantime, that same hole served to restore communication above ground, providing updates on the Zulu and a situational awareness of the environment external to the building. If necessary, they could relocate the intelligence drones dropped by the Air Force to give them a better picture of their situation.

Everything looked benign, so Charlie removed more debris to let Team Two out. By that time, Team One had joined them and left the tunnel too. Now it was Pat and Charlie's turn.

"How's the fresh air?" asked Vera.

"It smells like a city," replied Pat.

Their objective was a small hill, just outside the city. They had to walk at the surface and, although early in the morning, there were people in the streets. That was a good sign, because that meant that the other side did not yet have a strong foot in this city. The data from the mini-drones did not indicate any abnormalities either, but that would soon change when the reality of war reached the city.

Because of the people, they could not use the squad's normal formation. There was no use in alienating the population by sending armed robots first. Pat led the squad. He walked with open visor and had slung his weapon as casually as possible on his back. Charlie took a configuration resembling something between a dog and a small horse. Research had shown that in that way bystanders perceived it as less threatening. The Alphas and Bravos placed themselves between Pat in the front and Vera in the rear, hugging the side of the buildings. Their weapons ready but folded. They would be slower to react to danger in this arrangement, but it was worth the risk. Anyhow, in this type of environment, unless a direct attack was detected, it was up to the human soldiers to decide what had to be done. And their reaction speed was much slower.

The last in the row were the Kilos. It was hard to give those a less threatening posture. Field test had shown that the sight of the Kilos at the end of the formation was less shocking to pedestrians because they had already seen the other robots. The chances of somebody approaching the squad from behind were slim, as they

were trotting at high pace and the last Kilo was radiating low energy microwaves towards the rear. Just enough to discourage ‘naturally’ accidental overtaking from the rear.

Whatever the formation, they stayed a strange group city dwellers and a prelude of what to come. The early pedestrians knew this instinctively, and interpreted it as a signal to hasten whatever they were up to that morning.

Pat tried to interact in a friendly way with passersby, while Charlie guided the squad to their objective. Thanks to the data stream, they had an excellent assessment of situation ahead. A short blip-sound informed them of the re-established link with one the Zulu’s helicopter drones. They now had a bird’s-eye view of their mobile position. That also meant that their missing member was nearby; a reassuring piece of information in case they ran into trouble. The aerial picture showed their objective, and nothing was standing between here and there. All went smoothly.

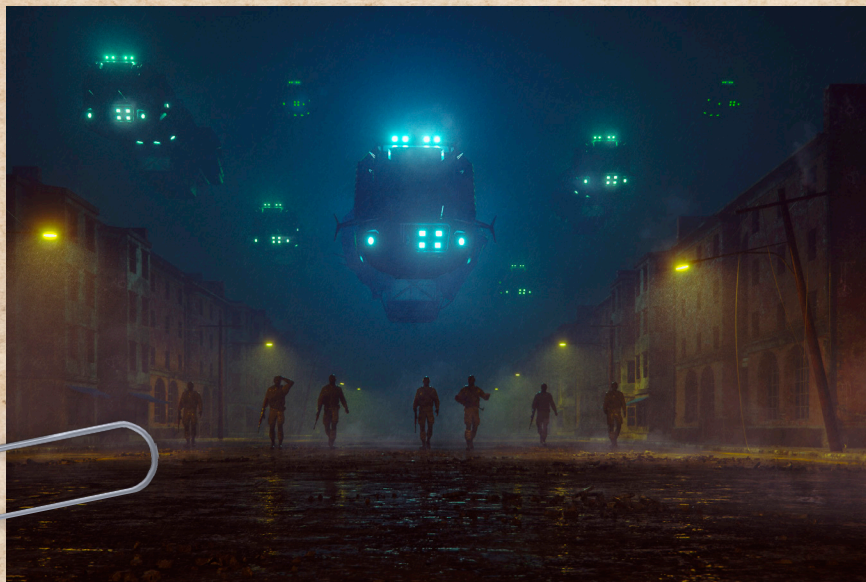
As they crossed the last big road heading towards the sleepy streets of the residential community leading towards the hill, they stepped up the pace. The advantage of being sooner in position outweighed the minimal risk of a human encounter. Being aware of their intention, the drone overhead took a more advanced position, providing a detailed view of the streets they had to use, and keeping track of human activity ready to warn them of a possible encounter. Team One rushed forward followed by Pat and Charlie. Thanks to their suit, they were running fast with minimal effort. The whole squad was no longer on the boardwalks but moving at high speed on the roads.



THE HILL

The part of the hill they were interested in was a city park. The slope would give them some natural cover, a good field of observation and did not oblige them to disturb a household. It was also convenient to know that in case of a fight they were far enough to not give cause for collateral damage. Team One was first in and drove to positions down the slope of the hill. The other teams followed, while the Kilos made sure nobody would enter the park for a morning run. Zulu reported to be on station too and to have deployed its missiles. Firing those missiles would not give away its exact position if their trajectory would be retraced.

The second helicopter drone was now high above in front of them, while the first had returned to recharge its batteries to be ready when in contact with the enemy. Vera tasked the forward teams to send their mini-drones further ahead as a detection screen against enemy micro- and mini-drones. Every member activated their camouflage and disappeared into their surroundings. The feed from above confirmed they were no longer visible. They were ready.



However, the same could be said about the ones they were waiting for. The task was to stop enemy troops if they moved towards them and the main landing force progressing through the city. Staying concealed while moving, even with high tech, remained very difficult. One small mistake would be most probably be detected, and making mistakes was more probable when you were on the move.

Sitting there, they went through the information on the status of the operation. Two of the five special reconnaissance squads were successful in securing a landing area. One squad had run into a minefield that was too smart to infiltrate undetected and had to turn back; another was detected prematurely and aborted the mission. The third was pinned down by the enemy and had to fight its way out leaving their Kilos to cover the retreat. The squad's Zulu had supported that squad in fending off an attack. They could see that the regular troops were engaged in some small running fights in the city, nothing major. The operation was going well. Most of the regular troops of Donovia were engaged in the main battle on the other front but that would not stay that way much longer. By now, it should be clear to the other side that there was a second front forming, one they could not ignore. Soon the opposing troops would show up.

Vera checked the status of the flying artillery. The near-satellite airship was positioned more to the rear, because of the risk of being intercepted. The greater distance made it possible to protect it by fighter kill boxes but resulted in a longer reaction time. The artificial intelligence operational planning software suggested launching loitering, flexible ammunition to make good for that delay. Vera suggested adding some armored piercing rounds to the package. She expected some harder targets to show up and the flexible bombs were less effective against those.

The software agreed with her assessment and prepared the order. Inside the airship's weapon shop, robots put together the different modules retrieved from storage and transported the assemblies to the launch path. Once left, the flying bomb contacted the squad informing them about the time on target and the maximum loitering time. It would report again when on station. Soon a swarm of bombs close by would be ready to answer any request for support. Together with the Zulu's arsenal, they formed a stopping force to be reckoned with.

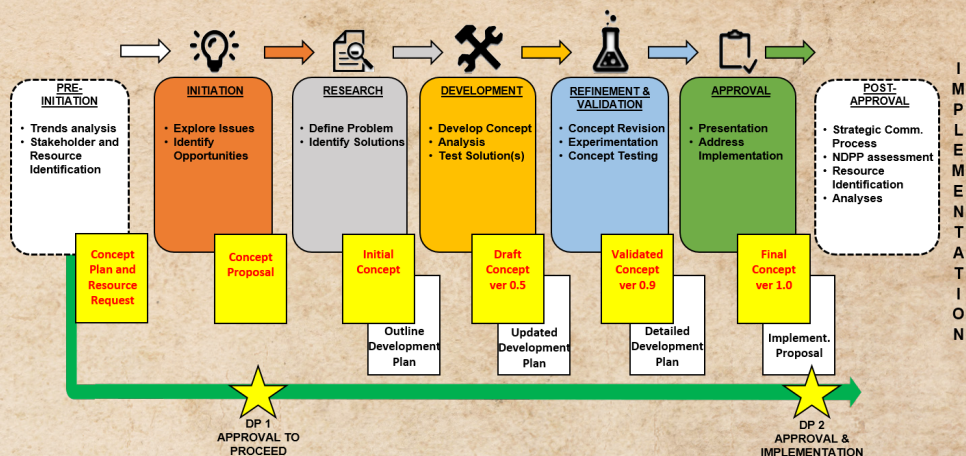
"Ready to wait. Again," thought Pat, "Even with all this technology, we have to wait."

Charlie slightly turned towards him. Did it read his mind?

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