QUALITY INFORMATION GENERATION

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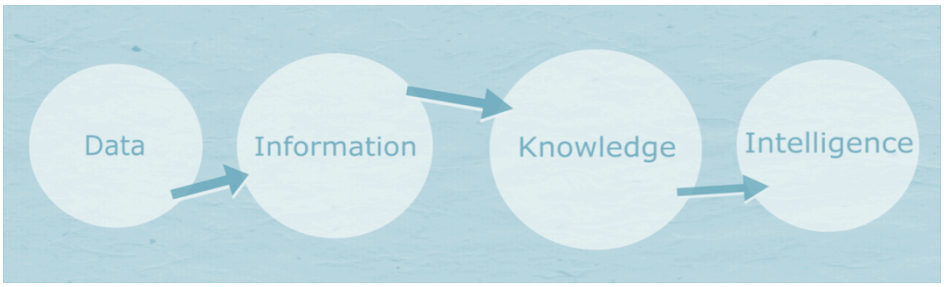
HOW TO CREATE QUALITY INFORMATION FOR INCIDENT INVESTIGATIONS AND PROBLEM MANAGEMENT

Thinking DIMENSIONS GLOBAL Management Consulting
KF KEPNERandFOURIE

Contents

How to Transform Information From Raw Data to SME Knowledge Effortlessly!

Many IT Professionals look at the same set of data and come to the conclusion that the raw data as it is represented at that time does not add any value towards making a conclusion. That might be true, but if you know what to do, that same set of data could be transformed successfully into highly useful insights for a problem situation. The secret is to use a process that would allow the investigator to transform the data into useful information. How do we do that? Like I said, using a specific process such as the following:



You need to know what to look for and how to go about doing this, but once you know which questions to ask it is fairly simple. **The golden rule is to ask the right questions from the right information sources at the right time to get the right answers that would provide a more detailed insight into the problem situation.**

The following procedure would be most effective in getting the right answers. At Thinking Dimensions we've been using these tools and techniques for at least 30 years and helped hundreds of clients to better understand the situation they are dealing with. Following the combination of the process above and the tools below helped them to solve really vexing problems in a relatively short space of time.

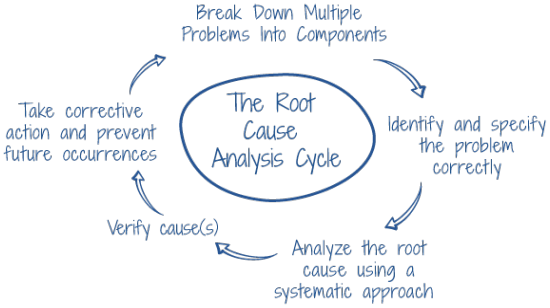
1 Insist on identifying the correct fault. In more than 95% of instances our clients were looking at the wrong problem and it is because they did not concentrate on finding the correct fault first.

2 Who has the information? Simple question, but powerful! One of two things we do differently from what the client tried before, is that we insist on having the right people at the session.

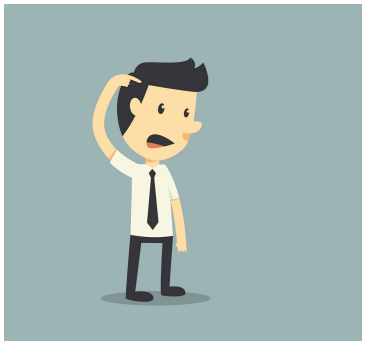
3 Asking, "What it is not?" This will create significant insight into the incident being experienced. This question normally leads to a curious contrast of what is happening and what is not happening and why that would be.

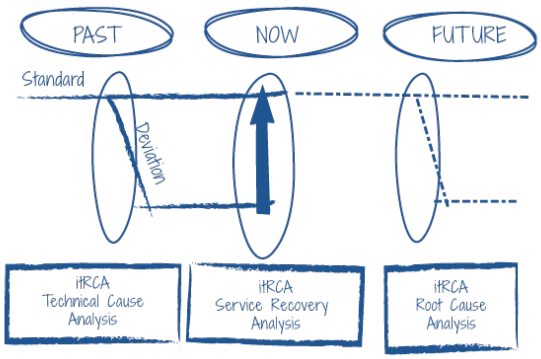
4 What is unique about this fault? This will get you and your team to the core in minutes! Providing normal answers would solve any fault that is normal, because they've seen it before and know the resolution. However, a persistent fault is normally a fault that has never been experienced before and needs an extraordinary answer.

5 Secret to virtual collaboration is a common process. That process makes provision for organized inputs and the array of information in such a way that would stimulate unique answers to the problem experienced.



Information Technology Professionals on a day-to-day basis are confronted with a variety of incidents that degrade the performance of operations. On a continuous basis the root cause of these problems need to be found and eliminated to reduce inefficiency and ensure service availability.





Root Cause Analysis involves a number of distinct activities. Initially problem solvers in Information Technology environments need to do technical cause analysis to ensure that end user service can be restored to it's required level of performance.

6 "Thinking outside the box" is this a cliché or does it really work? It is really working and this is most probably the most difficult exercise for IT professionals who are used to working with hard facts only.

7 Learn how to eliminate "pet theories" and "born losers" early. These theories are normally highly distracting and surprisingly tenacious. They keep on coming up and not adding any progress towards resolution.

8 Learn how to develop a useful hypothesis and test its logic. Learn how to imagine "what could have happened" and then be destructive in trying to eliminate it. This sounds counter productive, but it works.

I will cover each of these tools/factors and techniques separately in upcoming chapters, expanding on the "how to" so that you would be able to incorporate this into your own investigative approach, hopefully making you a savvier investigator!

1. Insist on Identifying the Correct Fault

Over the years as a consultant, I've learned how to listen to what people are saying, albeit doing it for a different reason you might have had in mind. I am doing it to eliminate the "noise" and "clutter" normally surrounding problem solving sessions. This might surprise you, but the biggest obstacle in solving problems and incidents effectively, is the human nature to "elevate" or escalate things in order to get the appropriate attention of the other person.

Hearing the words "outage" or "crash" in an IT environment is not something you would like to hear on your watch, because this kind of situation really spells "doom and gloom" for the person accountable for the function.

You need to possess the skills to ask questions that will break down these general and vague descriptions so that you and your team can get started with the real issue at hand. Dealing with information that is too general is going to stretch your investigation cycle way beyond the time you have any patience for.

Let's start at the beginning, and that is trying to be specific with two factors namely the "fault" you are experiencing and the "object" that has the fault. The terms "not working" or "it's dead" are not faults. These are descriptions of an end state or the consequence of the fault and still when you look at the problem description of most tickets you would notice such phrases and descriptions of consequences and or the use of extremely vague words.

Let's look at an example. You get the following problem description **"Website page dropping".** This does not look too bad and you most probably won't believe me if I tell you that this statement could be improved dramatically with the **use of a few process questions.**

So, look at the questions offered and look at the underlined portions and you would notice two question types that would help you to get your end user or client to arrive at a much more effective incident description and thus a much better chance to solve this incident quickly and accurately.

The aim is to start with an object or virtual object description and then to generate the fault associated with that object. The ultimate aim is to concentrate on the fault. I do not know about you but "web page **down**" does not cut it. The term "down" does not describe a fault, but rather an end state or consequence of a fault. So the trick is to get the team to identify the right fault to start the investigation with. Unless you do that exercise first you and your team will have a difficult time arriving at the correct cause of the incident.

In the following example, you will notice the importance of the following PROCESS questions: "What do you mean by?" and "Can you be more specific?"

QUESTION	ANSWER
What do you mean by website dropping?	Every time when I get to a specific page, the website drops off
Can you be more specific, what do you mean by a specific page?	It is the order application page, every time I try to go to the "checkout" page it drops
Can you be more specific about what you mean by "trying to go to the checkout page?	Yes, the moment I click the "checkout" button, I get dropped off the website
So, what is the actual fault you would like to solve?	The checkout button not activating my instruction
What would then be the most accurate incident description?	The CHECKOUT BUTTON NOT ACTIVATING MY INSTRUCTION, causing the page to close down

This is a good start to being more specific and instead of starting with "Website dropping" you now arrived at a statement that is more accurate and more specific "Web page checkout button not activating my instruction".

I mean, "Checkout button not activating" is quite different to "website page dropping!"

2. Who has the information? Simple question, but powerful!

One of the most important questions to ask yourself in attempting to solve an incident **quickly, accurately** and **permanently** is to ask the following three questions:

1. **What do you know about the incident?**
2. **What don't you know about the incident?**
3. **How can you collaborate with someone who could provide you with the missing information?**

"I'm going to cover my ears now to avoid information overload."

The million dollar question now is **"How do you know what information you don't have for this incident,"** because each incident is unique and might require different types of information? We suggest a simple "factor analysis" introduced by Rudyard Kipling more than 115 years ago. Once again this is a process approach that would be helpful in most diverse situations.

FACTOR TO CONSIDER	INFORMATION SOURCE TO BE CONSULTED
LOCATION OF FAULT?	Who would know best where this fault is occurring?
TIMING OF FAULT?	Who would have the accurate info of when this fault started?
WHO IS AFFECTED?	Which users are impacted by this fault?
SEQUENCE OF FAULT?	When in the process/procedure do we see this fault?
FREQUENCY OF FAULT?	How often is this fault occurring once it started?

You will be surprised to know that in many cases where I was involved in a client situation I had to obtain very specific information sources, who I believe were not invited in the first place. This goes with the quote by Chuck Kepner, "If a team could not solve an incident, the person with the appropriate information was not invited to the meeting."

Therefore when I get involved with a client investigation I make sure that I have the "appropriate brains" there and not necessarily the "best brains." Because I am a consultant a client company will go "all out" to get the most senior people to attend the meeting. They want to make sure their money is well spent and do everything possible to ensure a successful meeting.

In an incident investigation meeting I would like to have the information sources present that are actually involved in the incident or are working closely with the people involved in the incident. In many cases I have to insist to have an operator join us in a boardroom, which does not always go down well with senior management.

A good example is when I worked with an airline helping them solving a baggage problem. In the end it was the baggage handler with his dirty work attire that came up with the piece of information that convinced management of the possible cause of the incident being experienced.

If a team could not solve an incident, the person with the appropriate information was not invited to the meeting.

Thinking Dimensions Global excels at bringing teams together to find the information needed to solve any problem. Contact us for more information.

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3. Asking, "What It Is Not?" Will Create Significant Insights Into The Incident Experienced

In an incident situation we are always looking for that "Silver Bullet" question – the one question that would bring some insight to the incident being experienced. The good news is that there is such a question; in fact there are a few of these questions that could provide you with that insight needed. We call that the "but not" question.

Asking someone what the "fault could be" under the same circumstances "but is not" is normally met with a blank stare, because they either do not understand the question or they find the question highly counter intuitive. It is surprising, because we are used to asking this question in our everyday lives. Let's take the example of you getting home after dark and proceeding to put on the lights. When flicking the switch the light does not come on and without even thinking about it you move to the second switch to see if that one is working or not.

Why would you do that? Well, **without even knowing it you are looking for a BUT NOT to the existing situation.** Imagine this light did not switch on either…now you are concerned, because it now seems a bigger problem than initially thought. What do you do now? Now you are thinking of causes or reasons why this might be happening. Maybe it is a general outage or a circuit breaker that tripped. Quickly you would be looking for a BUT NOT. You look outside and see that the lights in the neighborhood are all on and you come to the conclusion that it must be the circuit breaker. Looking at a series of BUT NOTS you "solved" the situation.

Findings:

*In a recent **Production and Operations Management** article, researchers found that too much time or too little time spent defining the problem in question lengthened overall project time (Choo, Andrew, "Defining Problems Fast and Slow: The U-Shape Effect of Problem Definition Time on Project Duration). This is why it is of upmost importance to have a process and follow it when investigating incidents and problems.*

So, due to the insights created by asking BUT NOT questions and checking it out you came to a useful conclusion. We suggest the same kind of thinking in a business incident investigation situation. For instance you ask the question to a group of people "Where is this fault noticed in our operations?" You might get a fairly unsatisfactory answer such as "all over our operations". However, if I now ask a BUT NOT question such as "Where in our operations could we expect to have this same incident, but we don't?" We would discover information that would give us much better insight into the first answer. The staff might take some time to think about this and then agree on an answer, but they agreed that it is not happening in Hong Kong. Now that is what I call useful information!

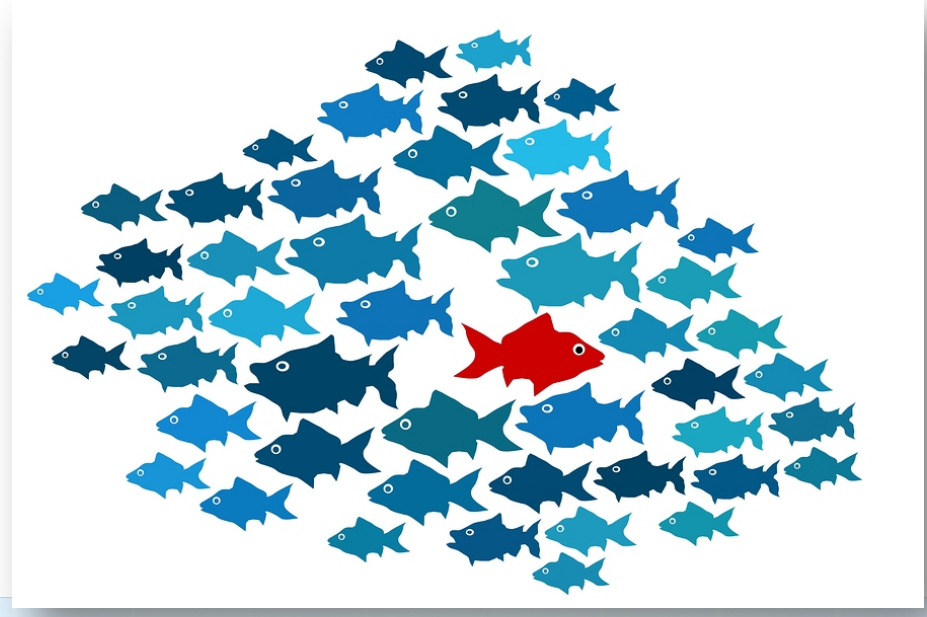
This BUT NOT question is a powerful process question aimed at creating anomalies that needs to be explained and which is normally the underlining factor in what is causing the incident. We would suggest you ask these BUT NOT questions for all the facts that you've uncovered for the IDENTITY, LOCATION, TIMING, USERS, FREQUENCY and SEQUENCE information collected during your investigation. This curious contrast created between what it is and what it is not is a highly effective way to create ideas about cause.

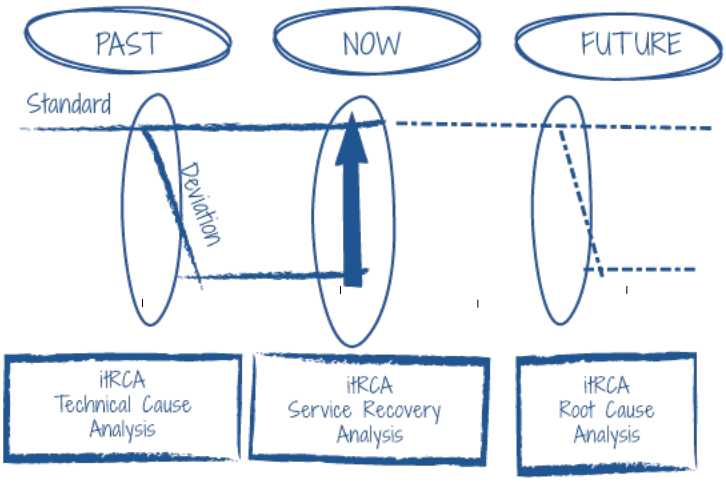
4. What Is Unique About This Fault? This Will Get You And Your Team To The Core In Minutes!

If you could not restore a service within three hours there is something unique about the fault being experienced – do you know what it is?

It is a fair assumption that if you experience an incident that is typical and normally has typical causes then all you have to do is to find which cause is the culprit this time. An example would be when you cannot get logged in to your normal email service. You know from your own experience that only a few things could cause you to be unable to get access. You quickly check these normal factors until you have found the cause and "solved" the situation.

However, did you know that if you knew the unique factor about your fault that you could have gone directly to the one or two typical causes that would be able to explain that uniqueness only? This would have made it possible to avoid testing all the possibilities before you got to the one that caused the incident.





This scenario is even more important in any IT/Business relationship and looking for the unique factors first could save you and your business colleagues a lot of effort, time and money. Again let's look at an example. You have a problem that you get booted off a website while doing quotes. Here are the typical reasons why this could happen:

1. **Your browser has a particular time out setting**
2. **You are using an unauthorized key or character**
3. **Too much traffic on the web and getting bumped off**
4. **There is a certain field that has a compatibility issue**
5. **There is a corrupted file in the application and you need to reboot**
6. **Search engine having intermittent problems causing you to be booted off**

I think you would agree that it would take a long time to work through all of these possibilities why you are getting booted off. However, let me ask the uniqueness question. **"What is unique about the fault of being booted off?"** The uniqueness could be in the location, timing, type of user or size of fault. In this case I only get booted off after 4pm in the afternoon, every afternoon. That is what is unique about my situation.

So, which of the six possible reasons mentioned above would be able to explain why I only get booted off at the end of the day? The aim would then be to find the one or two reasons that would explain this uniqueness and then to focus on these to restore my service. The following is a rudimental explanation for the sake of this example:

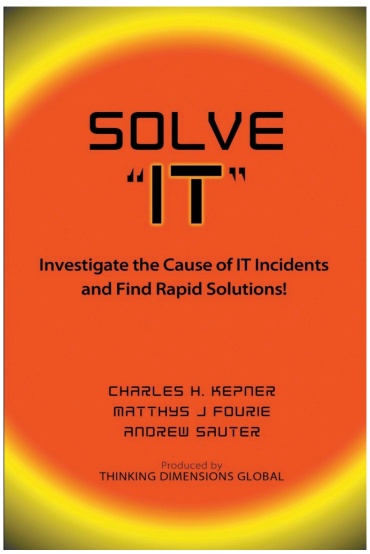
The uniqueness could be in the location, timing, type of user or size of fault.

POSSIBLE REASON	EXPLANATION
1. Your browser has a certain time out setting	**No**, this is normally after a certain time elapsed and not a time of day
2. You are using an unauthorized key or character	**No**, this is not time related and could happen at any time during the day
3. Too much traffic on the web and getting bumped off	**Yes,** this is possible if it could be confirmed that traffic is high as from 4pm
4. There is a certain field that has a compatibility issue	**No**, this would be a certain page and not time related
5. There is a corrupted file in application and you need to reboot	**No,** we should then have the problem all the time
6. Search engine having intermitted problems causing you to be booted off	**No,** should be happening at any time of the day and not just after 4pm

Excerpt from *Solve "I.T.": Investigate the Cause of IT Incidents and Find Rapid Solutions,*
written by Charles Kepner, Mat-thys Fourie, and Andrew Sauter

The IT professional is constantly struggling with information overload when addressing Incident and Problem Management situations. They need an approach that would dispense with all the different dimensions and layers of data and information to reveal the true nature of the incident or problem as early as possible.

What the incident and problem investigators need is a structured, systematic thinking process that helps them to discover the information that is relevant and remove the irrelevant information. Imagine having access to a process that would deliver the correct starting point and provide you only the relevant information first time every time. Even better, imagine having a structured set of 18 questions that would identify what information is missing and therefore the reason why the cause has not been identified yet. When the investigator trusts the process he or she will have a more direct approach. "You wither know the answer to the question or you need to get someone to go and get that specific information!"



Looking at the example above the only possible reason that could remotely attempt to explain the situation is the only time related reason that could explain why it was happening at 4pm every afternoon. This should be easy to check with Networks and if confirmed would need a "workaround" suggested by Networks.

So, the conclusion is that if we do know what the unique component of our fault is that would enable us to focus in onto the most probable cause/reason quickly and help us to restore service quickly and accurately **without having to perform too many "trial & error" fixes.**

5. Secret To Virtual Collaboration Is A Common Problem Solving Process

How do we ensure we get the best information at all times, especially if our company is located over different time zones?

Global organizations find it increasingly more difficult to deal with decisions and investigations effectively, especially if some of the stakeholders and information sources are not in the same location. What do you do if you need to make a decision and one of your most important stakeholders is on the other side of the world?

Using a **common approach** and process towards problem solving will help individual stakeholders and information sources to participate and contribute remotely. The stakeholders would know what is expected from them and would also understand the requirements of the thinking process at any given stage. The **KEPNERandFOURIE root cause analysis** and problem solving processes consist of only four steps and each step is stand-alone and can be performed separately. The KEPNERandFOURIE thinking approach also uses various techniques and the remote contributor can easily provide inputs using the techniques learned. These tools and techniques are embedded in common Excel Spreadsheets that would be used by all.

Let's take the example of having to find the technical cause of an incident and we are doing an exercise to eventually get to the root cause in our Problem Management department. The steps are:

1. **Identify the Incident Statement** – All the information sources understand the technique of having "one object" with "one fault" to describe an incident. The facilitator could get this set up with the incident or process owner, but any information source that has a better and more specific description would be able to contribute that to the team.

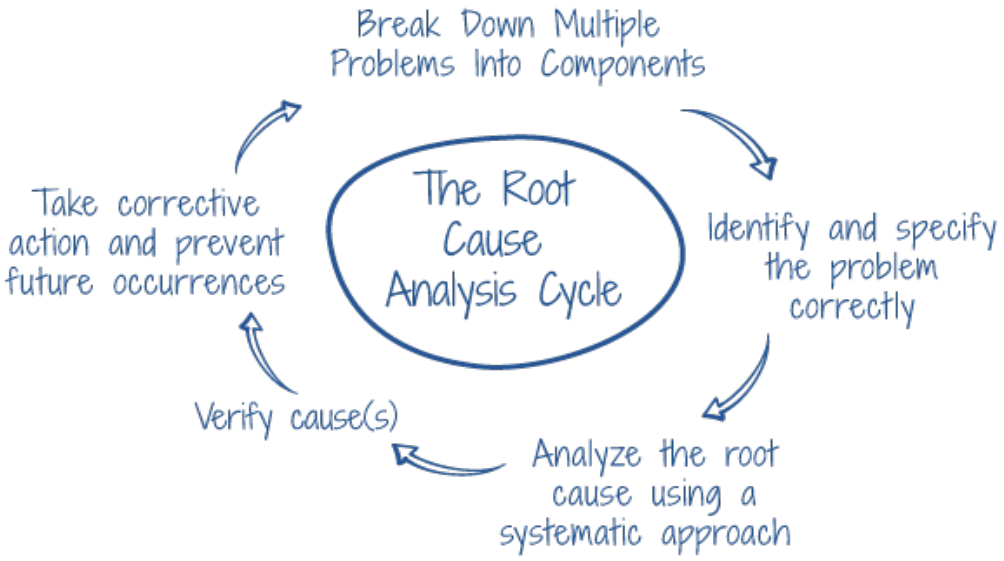
2. **Identify the Incident Detail** – All the information sources know they will be looking at the five dimensions of a factor analysis of WHAT, WHO, WHERE, WHEN and UNIQUENESS and would be able to contribute effectively. Particular responsibilities could be identified to specific information sources that are tasked to provide the most accurate information relative to the questions they are responsible for. All of this factual information could then be summarized by the facilitator and fed back to all information sources asking them to generate possible causes based on the information already collected.

3. **Generate Possible Causes** – Everyone is allowed to suggest causes as long as it is a causal statement that could explain how the fault could have occurred. This is recorded for all to see and would be used during the testing phase.

4. **Testing and Verifying Technical Cause** – All the participants in this exercise would know how to use the common template and the technique of how to ask the "test question". They could therefore contribute individually and be managed collectively by the facilitator to arrive at the most probable cause that would to be verified through replication exercises to eventually establish the technical and root causes.

By using common tools and techniques the possible information sources at various remote locations would be able to contribute effectively. This is all based on the assumption that you have the time to perform this analysis.

If you are in a crisis situation, you might have to resort to a common time zone and through a videoconference use a facilitator to then work through the investigation process in real time. **This will allow the common process, tools and techniques to help the facilitator work through the investigation quicker and more effectively.**



6. "Thinking Outside The Box" Is This A Cliché Or Really Working?

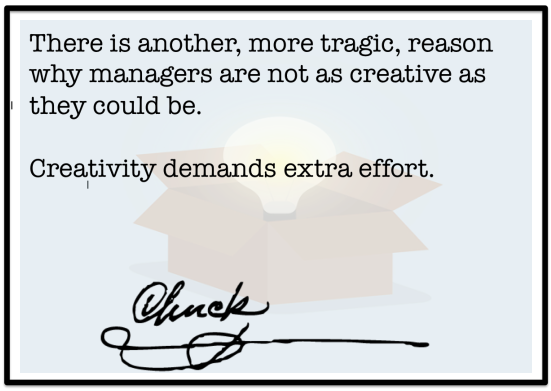
If you want to put fear in the hearts of IT Professionals, ask them to "think out of the box". It is not that they cannot do it rather than the fact that they are not used to doing that in dealing with IT problems and Incidents.

I've been involved in many sessions with IT teams in Incident Investigation situations and I've come to the following conclusions as to why this is a problem with IT personnel:

1. **Most people do not associate "thinking outside the box" with that of incident investigation.** This function is normally associate with trying to identify the truth and not to be creative about the situation. That is a basic pitfall, as I will explain later.
2. **IT Professionals are used to working with hard facts at all times;** proving and disproving theories based on logic as it is known at that point in time. Effective problem solving is normally a combination of rational and intuitive thinking, which when combined will give you a quick and effective way of arriving at certain hypotheses.

Is this a cliché? No it is not and it is really working very well. The aim is to get a quick factual snapshot of what is really happening and then to use SME intuition and gut feel to generate possible answers. We've found over many years of doing this that in 99% of cases the IT professional would have an idea of what could be causing the incident or what would be the best way to restore a service. The problem is that you might have at least six different suggestions and you do not know which is correct in this case.

So, we would like to "tap" this intuition of the SME more effectively during incident investigations and that is why we need them to be "thinking outside the box." The clinical fact is that if we do get to the stage where we need to do a formal analysis it means that the SME's could not provide a solution for the problem. If this has been going on for at least 6 hours or more we could make a fair assumption that all the resident theories have been exhausted.



Therefore, at this juncture we need to ask the SME to dig deep into their experience and their own knowledge base to come up with "out of the box" suggestions. We now ask them the following questions to "jumpstart their thinking:"

1. **Outside of your own function, what do you think could have happened that could have influenced this situation?** For example: Did anybody change a code or certificate?

2. **What other system, process, hardware, software or something similar could have had an influence on your situation?** Maybe there was an integration problem, maybe someone cleared their disc and deleted your driver?

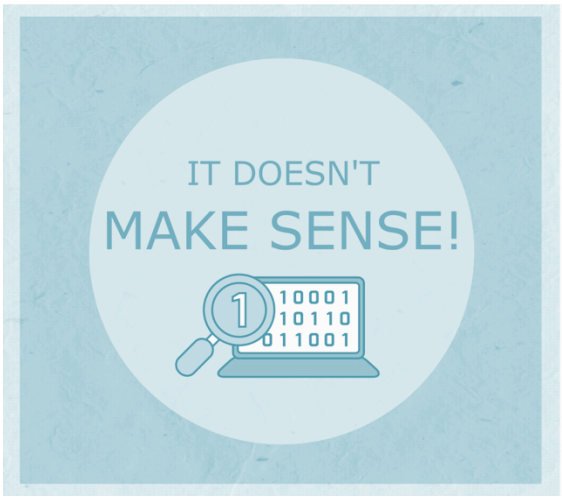
When set-up correctly; we normally do not have a problem getting the SME to be prolific in contributing theories. You must however, create an environment where this is OKAY and the SME must feel they are encouraged to do this and that there is no suggestion that any outcomes would be held against them.

The key is to get them to be "creative" in this way and then to allow them to test these theories against their collective logic in order for them to arrive at an answer that eluded them up to this point. You can imagine the pride and excitement when they arrive at new highly probable causes to be verified.

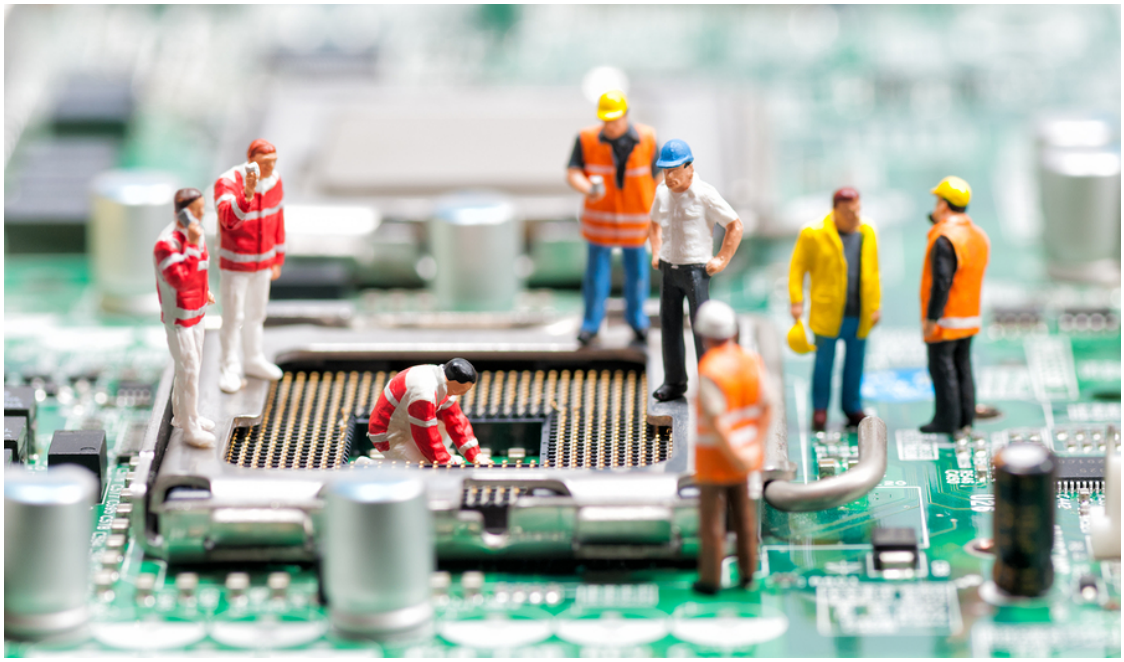
7. Learn How To Eliminate Pet Theories and Born Losers Early

What do you do when you have a SME or two that are adamant that they have the answer and they cannot understand why you are wasting time not listening to them? When not acted upon these individuals could become quite destructive in the meeting and could derail your investigation altogether.

I want to show you a natural and powerful method in how to handle these kinds of situations. I am calling it a natural approach, because you are already using the basics in your personal life and I want to show you how to elevate this into your business life as well. It normally starts by you saying, "that does not make sense" to a situation that was presented to you and you do not believe it is correct. Let's look at a typical example. Have you ever found yourself in the following situation?



Someone says to you, "The reason why you have a problem with allergies is because of the air-conditioning system recirculating stale air". You listen to that argument, but you cannot "buy" it, because you have air-conditioning at home and you are not experiencing the same problem there. So, at this stage the theory offered does not make any sense and you would most probably answer, "John, if that were correct, why do I not have a problem at home where I also have constant air-conditioners running all the time?"



In KEPNERandFOURIE we love this question and we formalized it so that this highly effective question could be asked at any stage of an incident investigation. This question is; **"If (x=pet theory) is the true cause then how does it explain we have a problem with the IS factor and not the BUT NOT factor?"** As you can see from the stated question, it follows the same logic as was mentioned in the personal example. Secondly to make this work we need the "IS information" and the "BUT NOT information."

To then utilize this question to eliminate or confirm pet theories or suggested answers quickly we would need some basic information about the problem or incident. I suggest you look at the factor analysis of WHAT, WHERE, WHO, WHEN and quickly generate IS and BUT NOT information for what ever you have at that stage. The best is to make this visible, because it has much more impact when you actually ask the "test" question. For example:

DIMENSION	IS	BUT NOT
WHAT	Co Internet down	Company emails are fine
WHO	Only in Asia	In the UK
WHEN	Only after 4pm	Any other time of day

Now, let's imagine one person offers their pet theory of "Network Issue" as being the culprit in this situation. Now we will phrase that test question in the following way:

WHAT: If "Network Issue" is the true cause of the incident, how does it explain we have the problem with the Company Internet and we do not have a problem with the Company Emails? Now the pet theory person needs to explain how that would be possible.

WHO: If "Network Issue" is the true cause of the incident, how does it explain we have a problem with only Asia and we do not have a problem with our Internet in the UK? Again the pet theory person must be able to explain this situation. The last one would be the following question.

I suggest you look at the factor analysis of WHAT, WHERE, WHO, WHEN and quickly generate IS and BUT NOT information for what ever you have at that stage.

WHEN: If "Network Issue" is the true cause of the incident, how does it explain the problem only occurs after 4pm every day and not at any time before 4pm?

If the answer is negative in any of the three scenarios then the pet theory offered, "Bombs out" and we could then agree the "Network Issue" cannot be the cause of the situation. Now you have a method to challenge the logic of the other person effectively, without having to tell them in their face that their identified cause does not fit the facts.

8. Developing a Useful Hypothesis Is the "Acid Test" for Finding Effective Root Causes

If you cannot develop a useful hypothesis for a specific problem situation you do not have a worthwhile cause to be considered. A hypothesis in itself is a test of your ability to link a cause to that of the incident/fault experienced.

Your hypothesis must be able to explain how that particular fault could have occurred. In other words you need to phrase your hypothesis as a causal statement. This is easier said than done and to do this hypothesis properly you need to follow the following guidelines.

Your hypothesis:

- Needs to be stated as **specifically as possible**
- **Must identify the change** that broke the camel's back and caused the fault to occur
- Must explain the **unique aspect of the fault** experienced
- Must be a **logical** statement

Information Technology Professionals on a day-to-day basis are confronted with a variety of incidents that degrade the performance of operations. On a continuous basis the root cause of these problems need to be found and eliminated to reduce inefficiency and ensure service availability.

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Let's take the example of your staff not being able to get access to a certain website during lunch-hour. If your **possible cause is too vague or generic** such as "Volume Issue" it could be interpreted in too many ways, which would make the testing of this logic fairly difficult. The problem starts with every person in the room having a different understanding of how the "volume issue" could have caused the problem. If you follow the guidelines above you need to get your problem solvers to be much more specific and also explain why we cannot log-on to the website during lunch-hour.

I would ask, **"What aspect about 'volume' are you thinking of?"** How would this volume issue be able to explain it only happens during the lunch-hour, because this is normally the time when most staff are out of the office.

However, if they tell you that it is because of this situation during lunch hour that Networks decided to do the database back-ups on a daily basis and due to the increase in traffic or volume being experienced. Now the issue starts to make more sense and would also explain why it is happening during lunch hour. Everyone would be able to grasp this explanation, because it is stating exactly the WHAT and WHY of the causal statement.

In fact a statement such as, **"Increased network traffic during lunch hour as a result of Networks doing database back-ups is causing high levels of volume which makes it difficult for normal users to log-on during the lunch hour,"** represents a CHANGE that gives us a perfect causal statement and hypothesis of what could be happening and why we have the fault as described. Many pet theories would be eliminated if you insist on having a well-constructed hypothesis developed to the above guidelines.

Summary

In summary, when you do faultfinding or incident investigation you can never go wrong being more specific in stating facts about the incident situation. The devil lies in the detail, and that is the level that is required to get to the bottom of any incident.

I must have done over 300 incident investigation and restoration sessions with clients and every time we needed to drill down for the relevant information to an even more specific level. Only once we were satisfied we could not get anymore specific we enjoyed success time after time and realized achievement first time every time.

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Dr. Mat-thys Fourie is currently Chairman of Thinking Dimensions Global and Managing Director of Thinking Dimensions USA and Thinking Dimensions Singapore and still works selectively with some of his clients. He is also co-author of the KEPNERandFOURIE® methodologies. Dr. Matthys Fourie is a Professional Problem Solver as accredited by the Institute of Professional Problem Solvers (IPPS). He has over 29 years of Problem Solving and Decision Making experience helping organizations across the world solve some of their most vexing and seemingly unsolvable problems. He is an author of several books on problem solving and decision making and is co-designer of the KEPNERandFOURIE® Thinking methodologies.

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