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Hintsa, Juha; Ahokas, Juha; Gallagher, Rosie; Männistö, Toni

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Supply Chain Security: Survey on Law Enforcement Agencies' Training Needs

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Juha Hintsa, Juha Ahokas, Rosie Gallagher and Toni Männistö

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Supply Chain Security: Survey on Law Enforcement Agencies' Training Needs

Juha Hintsa, Juha Ahokas, Rosie Gallagher and Toni Männistö

This paper studies of the types of training material which needs to be developed to order to help law enforcement fight crime more effectively in the context of international supply chains. The research is based on a survey of law enforcement officials and policy makers, concerned education and training matters. The results of this study highlight areas of supply chain security where the global law enforcement community may need new training material and information most urgently. Despite the fact that the relatively small and diverse sample size limits the validity and generalizability, the findings of this study help to design priorities, methods and target audiences for future law enforcement training programs. Over time, addressing these identified training needs makes the law enforcement community more able to prevent, detect and investigate supply chain crimes such as cargo theft, trafficking, and terrorism. The study also complements the limited body of empirical research on supply chain security and contributes to the theory of supply chain security by showing how law enforcement agencies perceive supply chain crime and the types of security solutions which they consider most useful for fighting it.

Keywords: Supply Chain Security, Law Enforcement Agencies, Training Needs, FP7-CORE

1 Introduction

This paper describes the design and piloting of a training needs survey for law enforcement on the topic of supply chain security. It took place in relation to the CORE Project, the world's largest supply chain security research project, funded through the European Unions' Seventh Frame-work Program. One aspect of the CORE Project seeks to disseminate its findings to key stakeholders by way of the development of education and training materials.

Knowing that law enforcement authorities are potentially important stakeholders in supply chain security matters, the project proposes to develop tailored training materials for this audience. The overall aim of this exercise is to enhance law enforcement capacity to prevent and investigate crimes linked to global supply chains.

First, we review the available literature on the subject of adult learning generally, and then on adult learning in law enforcement contexts in particular. We then provide a brief overview of the literature available on the subject of supply chain security. We explain the ways in which these bodies of work influenced the design of the survey.

The paper then discusses in detail the survey design, explaining in turn each question which was included in the survey. Subsequently, we dis-cuss the results of the survey based on the responses derived from con-ducting the survey at the LE TrainNet Meeting (Networking Meeting of the Law Enforcement training institutions) which took place in Baku, Azerbaijan, 28-29 April 2015.

2 Literature Review

2.1 Adult Learning

The study of adult learning as an academic discipline has gained increased interest in recent decades.

Knowles (1973), a key proponent of adult learning theory, is credited with revitalizing the use of the term 'andraogy,' as the equivalent of pedagogy for adults, revived from a term employed in Germany as early as 1833. Working within a humanistic framework, Knowles' work around andragogy revolves around the notion of adults as being autonomous, self-directed learners whose acquisition of knowledge is facilitated by teachers or trainers. Knowles put forward a number of principles of adult learning, stating that: adults are self-motivated and self-directed, adults bring their life experiences and knowledge to their experiences of learning, adults have a readiness to learn, and are relevancy-oriented and practical in terms of their learning.

Fidishun (2000) further put forward the premise that adult learners have a great deal of agency in their learning, and that they are resistant to learning when they feel that the information is being imposed on them. The Baku survey takes heed of this principle, by asking the audience to identify their own precise training needs.

Brookfield (1995) explored four key areas of research in adult learning which together compose a central body of work for adult learning theory. Firstly, the notion of self-directed learning is critical to adult learning theory, whereby adult learners seek out their own learning goals and resources and play an active part in evaluating their progress. Secondly, he raises the

point of critical reflection, knowing that adults approach learning with critical thinking, paying careful attention to context. Thirdly, Brookfield notes a convergence towards establishing experiential learning as a central tenet of adult learning, given that making reference to real-life adult experiences give meaning to the processes of learning. Finally, he consolidates the literature around the process of 'learning to learn' in adults. This focusses on the notion that adult learners take ownership and interest in the process by which they acquire knowledge, such as taking the time to understand their own learning styles and patterns, with a view to optimizing their own cognitive acquisition of knowledge.

Houle (1961) developed a typology for different kinds of adult learners, arriving at three broad categories: goal-oriented (those seeking to achieve specific objectives), activity-oriented (those who partake in learning in order to derive meaning from the social circumstances) and learning-oriented (those who seek learning for the sake of learning). The main impact of this for the Baku survey was that there is clearly no 'one-size-fits-all' solution for adult learning, just as there is no single profile for an adult learner. Thus, in Q4 of the survey (which addresses learning methods) it was important to suggest a range of options and not privilege one type of learner over another.

2.2 Adult Learning, for Law Enforcement Authorities (LEAs)

There exists a great deal of literature on the topic of effective strategies for adult education, and a smaller but consolidated body of literature on effective training for law enforcement authorities.

In applying Knowles principles of andragogy to police training concepts, Vodde (2012) establishes six constructs for structuring effective police training, as follows:

1. Institutional and instructional philosophy - should reflect the mission statement of the police institution.
2. Affective orientation: climate, tone and environment - creating a learning environment which challenges yet nurtures police trainees.
3. Self-concept and self-directedness - recognizing the role of individual autonomy in police training activities.
4. Integration and facilitation of curriculum - training curricula should respect the interlinked and inter-related nature of the subjects it covers.
5. Application and integration of experiential learning - police training should provide opportunities for exercising new skills in practical environments.
6. Stress and discipline - principles of accountability and hierarchy should be worked in to training activities, whilst still fostering an environment of mutual trust and respect.

Thus when devising the Baku survey, it was important to select learning methods which work within these themes and are accepted to be effective for law enforcement training generally. The main themes which were picked up on were: constructivism and problem-based learning, lifelong learning and flexibility, and construction of knowledge as a social process. Each of these will be detailed below, with an explanation of the way in which they were incorporated into the Baku survey.

2.2.1 Constructivism and Problem-based Learning

Firstly, it is widely established that training for law enforcement is most effective when it is hands-on, practical and with direct applications to the daily work of officers. Working within this framework, the value of using constructivism to view police training and education can be underscored. Constructivism, whereby meaning is generated from interactions with others, can be a useful lens through which to view police training, as it implies the effective identification of problems whilst planning for the resolution of these problems in real-life environments. According to Goldstein (1990, quoted in Glasgow and Lepatski, 2012): effective policing consists of proper recognition and research of "problems" and planning to try and solve those problems. Problem-based learning is thus a highly-effective strategy for use in police training.

Constructivism and problem-based learning centralises the learner as the makers of meaning and knowledge, and brings together problem solving and free discovery in order to assist in the development of a learners' ability to solve real-life problems. For this reason, the Baku survey invoked the possibility of using problem-based learning, practical exercises and demonstrations.

2.2.2 Lifelong Learning and Flexibility

The importance of lifelong learning, closely correlated with the knowledge and skills needs of the workplace has been underscored by a number of theorists. Lieb (1999) noted that training programmes for adults should take into account the fact that, unlike child learners, train-ing constitutes a

commitment of time and/or resources, knowing that adults are often heavily committed elsewhere in terms of their profes-sional and family lives. As a consequence, a number of theorists have cautioned that programmes for adult learning must be flexible, adaptable and sensitive to the particular needs and constraints of the adult learner. Davis et al (2004) outlined an infrastructure for online learning: "once developed, any infrastructure must be able to evolve in order to accommodate changing student needs, technologies and curricula."

In the case of law enforcement, there is a strong potential for the application of lifelong learning as there is a clear need for training to be frequent, repeated and constantly updated in order to match the ever-evolving needs of the profession. Working within this framework, the Baku survey recognised that e-learning, distance, blended learning, or mobile phone application solutions may be of value in transmitting knowledge on sup-ply chain security to a global law enforcement audience, in addition to proposing the traditional Socratic methods. According to Lieb (1999) and others, adult educators notice that learning happens in each individual as a continual process throughout life.

Training solutions thus need to be flexible and adaptable, and envisage modalities other than the traditional classroom-based ones so that they can be taken up, in theory, by any officer at any time. For this reason, some of the suggested outcomes (Baku survey Q4) include e-Learning, mobile applications, blended learning and case studies.

2.2.3 Construction of Knowledge as a Social Process

A number of theorists underline the construction of knowledge as a social process, particularly in the constructivist tradition. Jonassen (1999) postures that constructivism creates a highly-fruitful learning environment in which students become actively involved in the creation of their own knowledge. Socialisation is key to this process, as the constructivist environment encourages learners to 'bounce' ideas off one another. Indeed, in this school of thought learning occurs best within a social group (Karagiorgi and Symeou, 2005), where there are some elements of the real-world environment, which replicate the workplace.

Collaborative groups can be used in police training to "test [their] own understanding and examine the understanding of others as a mechanism for enriching, interweaving, and explaining [their] understanding of particular issues or phenomena." (Savery and Duffy, 2001, quoted in Glasgow and Lepatski, 2012).

Therefore in designing the survey, we placed an emphasis on learning modalities which were interactive and with a strong social dimension including: collaborative problem-based learning, debates, practical exercises, role playing and serious games.

2.3 Supply Chain Security

Supply chain security management aims at mitigating the likelihood and consequences of intentional acts meant to cause harm in the supply chains (e.g., Pfhol, Köhler and Thomas, 2010; Nagurney, Manuj and Mentzer, 2008; Closs and McGarrel, 2004).

According Männistö (2015) the main goals of supply chain security solutions are discouragement and opportunity reduction, protection of cargo integrity, detection and interception, and investigation. Discouragement and opportunity reduction includes increasing efforts needed to commit crimes (e.g. strengthening targets with security locks and controlling access to accounting systems), increasing risk to be arrested and convicted (e.g. strengthening formal surveillance such as police and guard patrolling), and reducing rewards (e.g. using product authentication technologies, licensed customer care). Protection of cargo integrity means measures which prevent motivated offenders to bring valuable assets in their possession. These measures encompass structures that give resistant against manual, electronic or electromagnetic efforts to break-in (burglar resistance doors and windows, tamper proof containers) and security technologies and services that detect intruders and alert people who are capable to intercept intrusion. Männistö includes here also security screening and vetting aimed at detecting dishonest employees and business partners. Detection and interception means security solutions which prevent the escalation of security incidents while offenders have already succeeded to initiate criminal acts, such as the concealing of contraband in transportation units. These security solutions include scanning of containers and risk assessment techniques that help to detect dangerous or contaminated containers and consignments. Investigative measures come into a play when the adverse consequences materialize. They aim at limiting the extent and duration of supply chain breach and assessing financial losses or

personal injuries and casualties. Investigations can also shed light on current supply chain vulnerabilities that can be mitigated and prevented in the future.

The main goal of the FP7-CORE project is to develop and test technologies which facilitate legitimate trade and minimize disruptions due to inefficient customs processes and other law enforcement controls. Consequently, the survey focuses on technologies, methods, tools and databases which improve detection and interception, and public-public and public-private data sharing and collaboration. Data sharing encompasses both multi-agency collaboration on national level and international level, and includes improved data sharing between customs and police. The questionnaire includes tools and databases that enable to assess, screen and inspect the cargo traffic focusing on specific crime types, trade lanes, transport systems or commodity types. Overall threat and vulnerability assessments are also included. In addition, tools to assess compliance with compulsory and voluntary supply chain security programs and initiatives were assessed in the questionnaire. The last group contains different cargo screening and scanning technologies, electronic seals and transport vehicle track & trace technologies.

The findings of the literature review provided us with a basis from which to develop a survey which was both sensitive to the realities of education and training in a law enforcement context, and to contemporary issues in global supply chain security.

3 Baku Survey Design

This survey gathers information with the aim of determining the types of training materials which need to be developed in order to help police and customs law enforcement agencies to better combat crime in the context of international trade lanes. The survey features five survey questions with five Likert scale response options, as below: 1. Not at all useful / important / effective, 2. Not very useful / important / effective, 3. Somewhat useful / important / effective, 4. Very useful / important / effective or 5. Cannot say. The five questions are listed below and explained in turn.

Question 1. How useful would it be for your organization to access new and enhanced training materials with regard to the following crime areas?

This first question identifies the key crime areas relevant to police and customs law enforcement work, where there is a need for new and enhanced training materials. Some of the crime areas proposed are: cigarette and tobacco trafficking, corruption, cybercrime, financial crime & tax evasion, maritime piracy, pharmaceutical crime and terrorism.

Question 2. How useful is it for your organization to learn about advancements in the following areas of supply chain security methods, tools, programs and datasets?

Here we have collected a list of technologies, tools, practices and programmes such as tracking and tracing technologies, anti-tampering technologies, risk management tools for overall threat and shipment, databases with intelligence on criminal acts and trends, collaboration practices among governmental agencies on national and international level. These options are derived from technologies, tools, practices and programmes

which will be demonstrated over the CORE Project, currently being funded by the European Union.

Question 3. How important do you consider it to be that the new training materials on supply chain security include the following types of content?

The contents of this list are derived from the discussions of a workshop in the framework of the CORE Project, which aimed at identifying approaches, aspects and perspectives which could be of use in developing new training materials. We listed items such as case study approaches, collaborative approaches, assessment of negative consequences and impacts, cost-benefit analyses, human factors and proactive approaches instead of reactive ones.

Question 4. Please rate each of the following learning methods, based on how effective you think they are for your law enforcement training activities.

Similar to Question 3, we created a list of training and learning methods and asked the audience to assess them according to their potential effectiveness. Learning methods proposed here included blended learning, classroom lectures, debates, e-learning, practical exercises, and role playing.

Question 5. How would you assess your expectations with regard to the benefits of new supply chain security training materials for your organization?

We were also interested to learn what kind of outcomes police law enforcement agencies could envisage for new education and training material on

supply chain security from the perspective of their organisations. We compiled options such as better use of organizational resources, improved efficiency and increase of successful prosecutions, seized goods and arrests.

4 Baku Survey Results

The research is based on a the responses of 16 law enforcement officials and policy makers, who took part in the LE TrainNet Meeting (Meeting of Networking of the Law Enforcement training institutions) which took place in Baku, Azerbaijan, 28-29 April 2015.

4.1 Target Population

The UNODC's LE TrainNet meeting seeks to promote closer cooperation between various organizations and institutions engaged in law enforcement training. Specifically, its key aims are to establish an inter-regional network of training entities encompassing all manner of law enforcement authorities, whilst establishing focal points within this network to facilitate the exchange of information of best practices in law enforcement training. A further aim is to explore the establishment of a common database of law enforcement training materials, using secure access procedures to restrict access to a law enforcement audience. Central to the LE TrainNet approach is the inclusion of law enforcement entities with varying mandates. It acknowledges that there are a number of topics and challenges relating to training for law enforcement globally, which are common to police, customs, specialised law enforcement units and border agencies. Those in at-

tendance therefore represented agencies from a variety of law enforcement backgrounds, with a common interest in topics of capacity building and training.

The interagency and inter-regional nature of this audience created a useful environment for the piloting of this survey, knowing that the aim of the exercise was to identify training needs for law enforcement in the framework of global supply chain security, to enable them to better combat criminal intrusions in the supply chain.

4.2 Profile of Respondents

The survey was shared with the attendees of the LE TRAIN-NET Meeting in Baku, Azerbaijan. A total of 16 responses were received, which reflects a response rate of 23.2%, given there were 69 delegates registered from the conference. However, based on an assessment that approximately 15 delegates were listening to an interpretation track when English was spoken, we can estimate that the response rate amongst English speakers was closer to 42.3%.

Of the respondents, the largest group came from governmental organisations (56%), with the remainder coming from inter-governmental organisations (25%) and academic institutions, (6% of respondents indicated 'other' or did not give a response.)

Of those who came from government, 44% identified as coming from police authorities, 12% identified as coming from customs authorities, and 6% from border guard authorities. The remaining 38% of respondents did not identify with one of these groups in particular, suggesting that more than a

third of respondents came from organisations with a broader law enforcement profile.
Geographically, respondents came largely from Europe and Asia, including the Middle East. Some countries of the Americas, namely Jamaica and the USA, were also represented in the respondents.

4.3 Limitations of the Survey

It is important to note that the relatively small sample size may limit the implications of the survey. However, an advantage of this sample is that those in attendance were representatives from various law enforcement training institutions, or of the training departments of major law enforcement organizations, often with a broad oversight of law enforcement training needs. Thus, where possible, the members of the audience were able to assess from an organization-wide perspective a number of the questions posed, and were often able to correlate their responses with their acute understanding of law enforcement training.

4.4 Results of the Survey

When the participants of the conference were asked to identify the crime areas which could be addressed through new and enhanced training material following areas were valuated the highest: corruption, narcotics and drug precursor trafficking, financial crimes and tax evasion, trafficking in human beings, trafficking in counterfeit goods, terrorism and cybercrime (Table 1). The participants had lowest interest in maritime piracy and export violations of dual use and strategic goods. The lesser interest in these

areas may be explained by the fact that these areas are clearly more closely correlated with customs authorities.

Table 1 Question 1. How useful would it be for your organization to access new and enhanced training materials with regard to the following crime areas?

Crime Area	Average
Narcotics and drug precursor trafficking	3,8
Corruption	3,7
Cybercrime	3,5
Financial crime & tax evasion - including fraud in customs duties, sales tax, excise tax etc.	3,5
Terrorism – focus in trafficking of chemical, biological, radioactive, nuclear or explosive weapons	3,5
Trafficking in human beings	3,5
Trafficking in counterfeit goods	3,4
Pharmaceutical crime	3,3
Cultural heritage & works of art trafficking	3,2

Crime Area	Average
Firearms & light weapons trafficking	3,2
Cigarette and tobacco trafficking	3,1
Natural resource trafficking - timber, fish etc.	3,1
Waste trafficking - hazardous & electronic waste etc.	3,1
Stolen vehicles	2,9
Wildlife trafficking - CITES violations	2,9
Dual use / strategic goods export violations	2,6
Maritime piracy	2,2

The survey then asked respondents to rate the extent to which a number of advancements in supply chain security methods, tools, programs and datasets would be of use for the work of their organisation (Table 2). The advancements in multi-agency collaboration including improved data sharing between customs and police were seen the most useful (if they focused on national agencies). Governmental agency collaboration on global level was assessed much lower. In the context of international supply chain

crimes the difference is quite surprising. The present study doesn't give an answer for this difference, but previous studies imply that lack of trust is possible factor which prevents sharing information among agencies (Urciuoli, 2013). When this situation is expanded to a global level, distrust often increases, leading to a reluctance to share information among agencies on an international level.

Table 2 Question 2. How useful is it for your organization to learn about advancements in the following areas of supply chain security methods, tools, programs and datasets?

Supply chain security methods, tools, programs and datasets	Average
Multi-agency collaboration on national level, including improved data sharing between customs and police	3,7
Databases with intelligence on criminal acts and trends across the global supply chain	3,5
Tools for risk management, focusing on overall threat and vulnerability assessment	3,4
Tools for risk management, focusing on a specific shipment / movement risk profiling and targeting	3,4

Supply chain security methods, tools, programs and datasets	Average
Technologies for screening & scanning cargo containers and other transport units	3,3
Tools to improve x-ray image interpretation among the front-line government officers	3,3
Governmental agency collaboration on international level, including improved data sharing between customs in two or more countries	3,3
Databases in international trade, supply chains and transport systems – with information on countries, export products, trade lanes, supply chain actors etc.	3,2
Databases to exchange x-ray images between agencies	3,2
Electronic seals and other anti-tampering technologies for cargo & transport vehicles	3,1
Tools for systems based security controls and audits, focusing on company processes and IT systems	3,1

Supply chain security methods, tools, programs and datasets	Average
Databases with intelligence on cyber threats and cyber criminals – specific to global supply chains	3,1
Due-diligence tools for companies	3,0
Databases on commodities – with information on restrictions and prohibitions, tax rates, dangerous goods, standard quality controls etc.	3,0
Automated license plate recognition tools	2,9
Cargo and transport vehicle track & trace technologies	2,9
Synergies between supply chain security and global trade performance	2,9
Trusted trader certification programs (AEO, C-TPAT etc.; including benefits for the companies)	2,6

Tactical, operational and strategic intelligence are key methods in the toolbox of police law enforcement officers. Tactical intelligence provides

analytical support for crime investigation and prosecution processes. Operational intelligence stands to benefit from a closer link to real-time information which describes present location and current or following movements of suspect consignments. The latest advancements in tools focusing on a specific shipment movement, using risk profiling and targeting were also assessed as useful. Also, x –ray interpretation tools, screening and scanning technologies were assessed valuable for their potential to provide learning materials. They make it possible to accurately time operations and the seizure of the goods.

Strategic intelligence focuses on criminal trends and new patterns, such as shifts in criminal markets and changes in organized criminal structures. It is therefore not surprising that databases with intelligence on criminal acts and trends in the global supply chain were assessed as valuable in the survey.

Methods, tools, programmes that are most commonly affiliated with customs matters were rated lowest; for instance, trusted trader certification programs are based on customs laws. The programs are fully managed by different customs authorities. Similarly, global trade performance parameters were not assessed as pertinent to police law enforcement work.

Table 3 Question 3. How important do you consider it to be that the new training materials on supply chain security include the following types of content?

Training content	Average
Human factors in crime and security covered	3,7
Collaborative approaches and best practices, both public-public and public-private	3,5
Consequences / negative impacts of illegal activities explored and explained	3,5
Case studies on security in global supply chains	3,4
End-to-end supply chain thinking - from sourcing, manufacturing & transport; to distribution, retail & reverse logistics	3,4
Proactive approaches and global best practices – in terms of crime prevention, risk mitigation etc.	3,4
Benchmarking with world-class organizations	3,3
Cost-benefit analysis included	3,3

Training content	Average
Multi-disciplinary approaches - e.g. operational, economic and legal aspects covered in parallel	3,3
Training materials grounded on solid theories in crime prevention, security, supply chain management etc.	3,3
Quantitative / numeric data included	2,9

We used the survey to explore which aspects the respondents wished to emphasize in training and education (Table 3). The audience aimed to highlight collaboration with other public and private stakeholders. They also wanted to see the role of human factors in often very technology-oriented security training.

The survey results highlight the importance of practical approaches in training and education methods. Case studies, practical exercises and role-playing were assessed the most useful methods (Table 4). Interactive approaches to the creation of learning materials, such as blended learning (combining classroom-based learning and e-learning) fits best with the requirements of the survey participants. This is perhaps unsurprising, given the established links between problem-based learning and effective learning outcomes for law enforcement.

Table 4 Question 4. Please rate each of the following learning methods, based on how effective you think they are for your law enforcement training activities.

Learning methods	Average
Blended learning (combines classroom and e-learning)	4,0
Case studies	3,8
Practical exercises	3,8
Role playing	3,7
Collaborative problem –based learning	3,5
Debates	3,4
e-Learning	3,4
Serious games	3,3
Shadowing / monitoring / learning by observing others	3,3
Simulations	3,3

Learning methods	Average
Demonstrations	3,2
Classroom lectures	3,1
Mobile phone / mobile device learning applications	2,9
Textbook reading	2,8
Modular learning	2,7

The final question of the survey addresses the potential organizational benefits of developing supply chain security training materials (Table 5). From the results of this question, it becomes clear that police organizations are goal-oriented. In this question, improved use of resources was evaluated higher than direct performance indicators such as increases in the number of seizures, arrests or successful prosecutions.

Table 5 Question 5. How would you assess your expectations with regard to the benefits of new supply chain security training materials for your organization?

Benefits	Average
Increase in number of successful prosecutions	3,4
Better use of organizational resources in intelligence	3,3
Better use of organizational resources in crime detection	3,3
Increase in number of seizures of illicit goods	3,2
Increase in number of arrests	3,2
Better use of organizational resources in crime investigations	3,1
Improved efficiency in processes & cost reductions	3,1
Increase in number of detection of serious offences	3,1

5 Summary and Conclusions

Whilst the small sample size limits the significance of results, some important trends emerge which concur with major themes in literature around adult education and law enforcement education. Practical approaches to learning, as well as an emphasis on human factors and intelligence-led policing stand out as important considerations when developing training materials for law enforcement on the topic of supply chain security. We have preliminary plans to replicate this exercise with a broader law enforcement audience, to be disseminated via electronic channels (such as email and Survey Monkey), with the option of translating it into other languages to expand its reach.

Of crucial importance during the Baku pilot was the fact that respondents acknowledged the possible added-value of supply chain security training for law enforcement, meaning that enhanced capacity in this area could lead to optimal direction of resources in intelligence-gathering exercises. This could clearly lead to greater organizational efficiency. Acknowledgement of this point is a promising sign of recognition from the law enforcement agencies themselves that supply chain security training is a worthwhile investment for their organizations.

This exercise equally underscores the importance of conducting thorough training needs assessment activities before developing training materials. A comprehensive training needs assessment phase is a vital aspect in this exercise, as it ensures that the resulting material can be and will be used by the people for whom it was designed.

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