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Modern Tools for Business TRIZ

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Abstract

In the early 1990s, first attempts were made to examine if a systematic approach used in TRIZ can be used beyond engineering: in particular, to assist supporting solving innovative problems and challenges within the areas of business and management. The experience gained since helps with drawing conclusions regarding the applicability of the approach as well as which parts of TRIZ can be directly used in the areas of business and management; which parts cannot be used or must be adapted; and what new knowledge is needed. The paper summarizes state-of-the-art of modern TRIZ tools for different types of innovative projects in business and management.

Keywords: *TRIZ, Business Innovation, Innovation Training*

1 Introduction

For a long time, engineering innovation has been among the most important factors driving the progress of human civilization. Today it is obvious that business innovation is not less important to successfully compete and becomes the necessity. Modern business environment is extremely dynamic and fast, information technology and global networking eliminate borders, which used to keep businesses in their comfort zones, the market continuously demands better services, competition even between small companies moves to a global scale.

At the same time there was no solid and proven method that would support business innovation. In search for a solution, more and more businesspeople turn their attention to TRIZ. While TRIZ nowadays is primarily known and used in technology and engineering, applications of TRIZ in business and management areas have been practically unknown. It should not be surprising: TRIZ was created by engineers for engineers. The vast majority of TRIZ professionals work in the areas of engineering rather than business due to historic reasons.

In addition, most of TRIZ experts working in the technology areas are vaguely familiar with specifics of business environments. It became obvious that a separate version TRIZ for Business and Management was needed.

Relatively recently, TRIZ developers started to expand application of TRIZ to business and management areas [1, 2, 3, 4, 5, 6].

The results appeared to be rather encouraging: a number of seemingly unsolvable business and management problems were solved quite effectively and efficiently. Such situation triggered further development of TRIZ for Business and Management, which has been actively evolving during recent years. A major step in further promotion of "Business TRIZ" was made by introduction of Darrell Mann's book "Hands-On Systematic Innovation for Business and Management" [7] in 2004. It triggered performing further experiments by business professionals in academia and industry.

In contrast to engineering innovation which occurs either in a technical product or in a manufacturing or a production process, innovative solutions in business and management have a broader scope and can occur at different places of a specific business ecosystem (Fig. 1). Red spots in the figure demonstrate where such innovations can usually take place.

Note that sometimes, to achieve improvement of collaborative efforts within the value network, innovation of a business system of a supplier can be demanded.

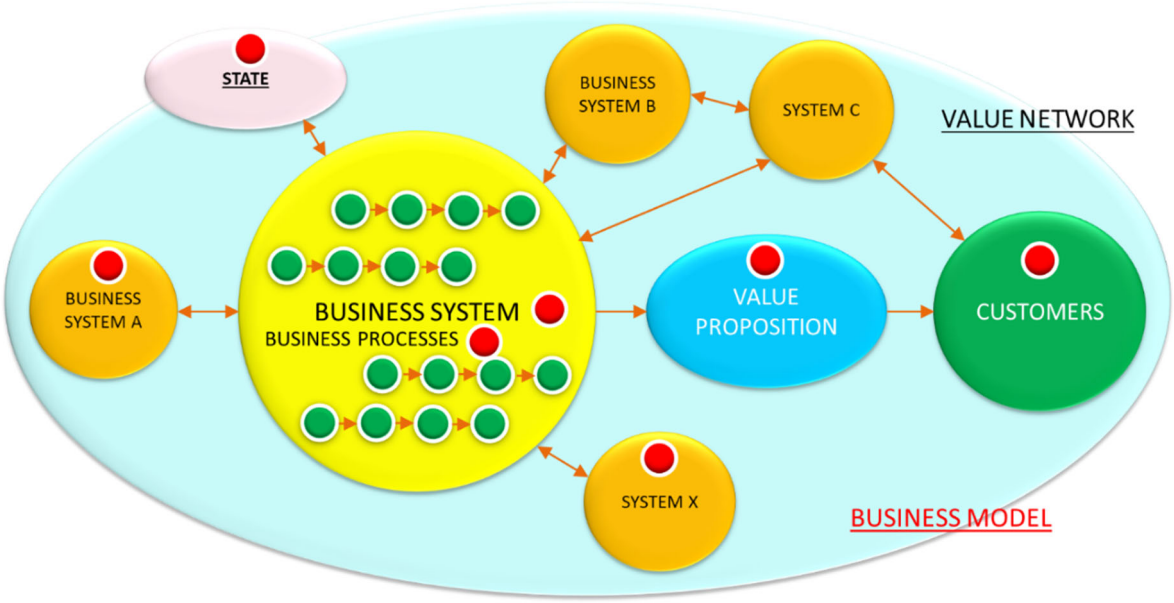


Fig 1. Red spots mark places where business and management innovation can take place.

As we all know, modern TRIZ is based on the assumption that all technical systems evolve according to certain regularities. Once we know these regularities, we are capable of predicting future evolution of systems and considerably lower the risks when choosing the direction of innovative changes. This assumption is based on the basic model of a technical system proposed in the early times of developing TRIZ by the author of TRIZ G. Altshuller (Fig 2).

It becomes obvious that the same assumption – evolution of applies to business systems, but with its own regularities. To unify business systems and to extract the patterns of evolution of business systems, a TRIZ-based model of a business system was suggested (Fig 3) [8]. Currently such a model is considered as fundamental and is used as a basic during the development of different TRIZ tools for business and management.

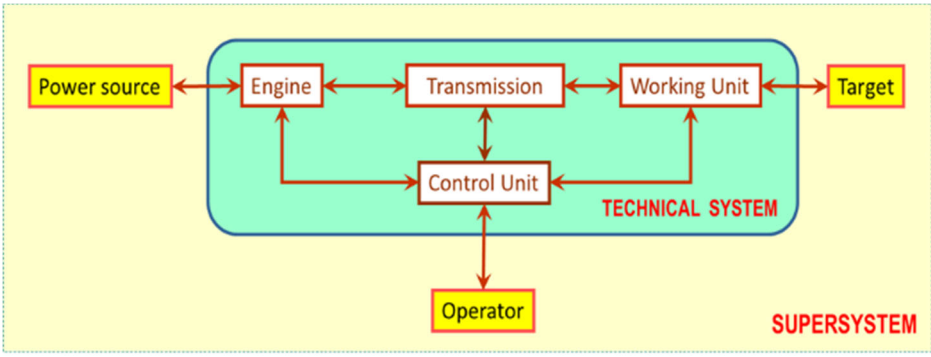


Fig. 2. Models or a Technical System in TRIZ

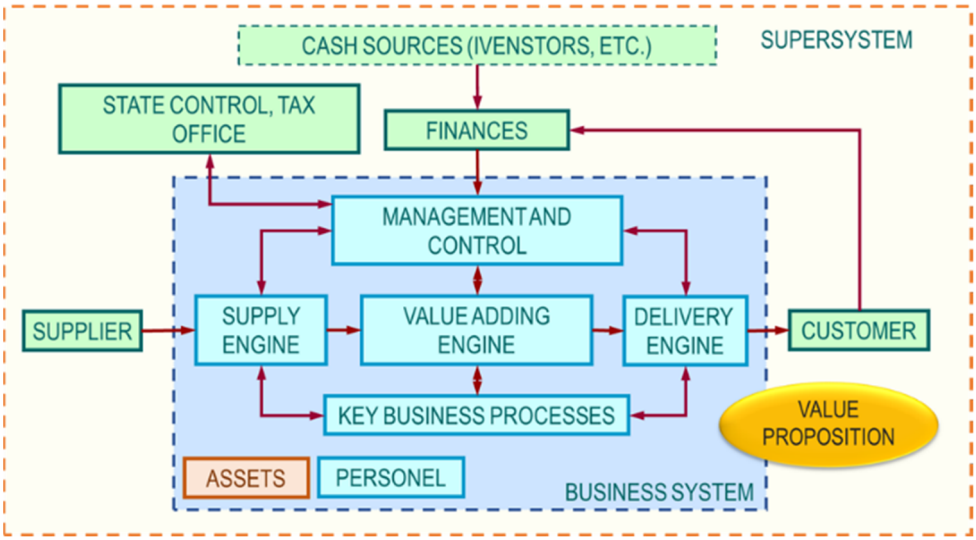


Fig. 3. Model of a Business System in TRIZ

A business system is a model of an organization which converts some input to a certain output by adding value. As seen, a model of a business systems resembles a technical system although includes different parts. Nevertheless, a conceptual similarity at a functional level helps to establish analogies and conduct many parallels. First of all, both technical and business systems are utilitarian systems, which are created artificially to satisfy some human goals and meet certain demands.

However, numerous attempts in the past to directly apply technical TRIZ to create business innovations or solve business problems mostly failed.

One of the reasons is a cognitive bias. When we explain TRIZ principles with the help of technical examples, non-technical people will understand the examples, but they will hardly connect it with their own area of competence and therefore will not capture these principles and incorporate them to their own practice.

To solve this problem, during a number of years, studies were conducted to understand which and how some parts of TRIZ can be adapted to business language and business tasks.

As a result, it was proposed to distinguish a different direction within TRIZ for systematic applications of TRIZ principles for business innovation, which is today known as “Business TRIZ”.

2 Modern Business TRIZ

Modern Business TRIZ is a result of 20 years of adaptations and developments. Its tools are smilar to the tools of technical TRIZ, including classical ones. They are structured to the currucila accordingly three large areas of competence (Fig. 3):

1. Tools for solving specific stand-alone problems.
2. Tools for analysing systems and processes, and extracting and ranking of problems. Disruptive innovations and process/systems cost cutting.
3. Tools for future forecast, breakthrough innovations, and antcipating failures.

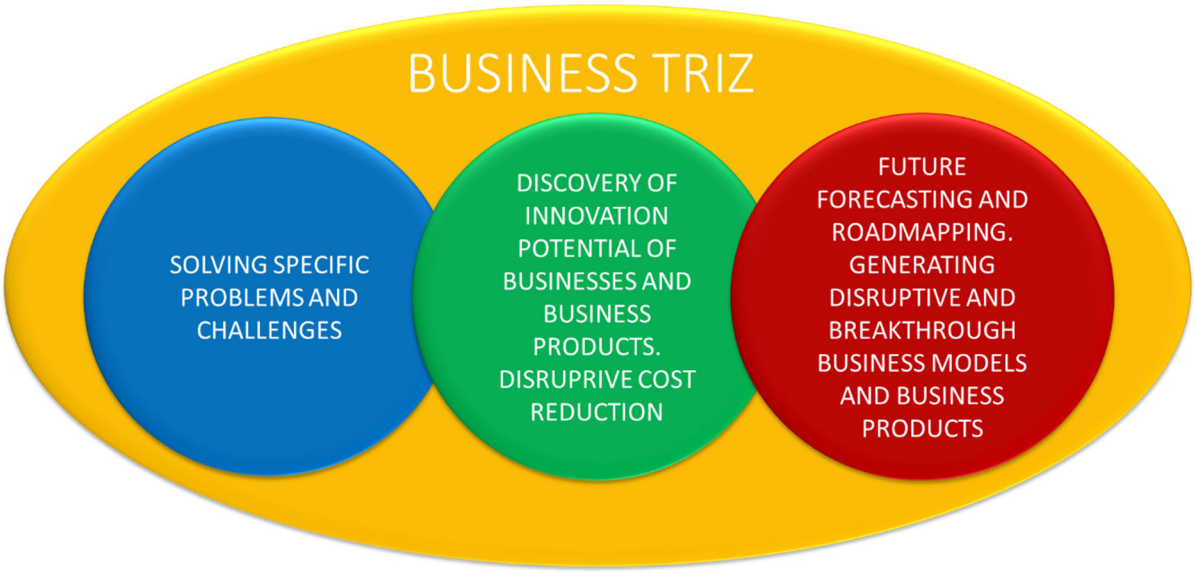


Figure 3. Three levels represent the current structure of Business TRIZ

Table 1 shows tools which are included to a modern training program for Business TRIZ. Similar to MATRIZ curricula for technical TRIZ, it consists of three competence levels.

Table 1. Tools of Business TRIZ in the current Business TRIZ Curricula

LEVEL 1: SOLVING A SPECIFIC PROBLEM / CHALLENGE	LEVEL 2: INNOVATION OF SYSTEMS AND PROCESSES, PROBLEMS DISCOVERY, DISRUPTIVE COST CUTTING	LEVEL 3: FUTURE INNOVATION ROADMAPPING
• Problem Perception Mapping. • Ideal Solutions. • Root Conflict Analysis (RCA+). • Principles of Separating Conflicting Requirements. • 40 Innovation Principles for Business and Management. • Contradiction Matrix for Eliminating Business Contradictions. • Ideas Portfolio. • Multi-Criteria Matrix of Solution Ideas. Integral Ideas Landscape.	• Business Model Assessment. • Function and Cost Analysis. Problems Discovery. • Function Idealization (Trimming) for Systems and Processes. • Object-Field Modeling. • Standard Inventive Solution Patterns for Business and Management. • Merging Alternative Competing Systems (Feature Transfer). • Function Oriented Search (FOS). • Main Parameters of Value (MPVs). • S-curve Analysis and Assessment.	• Value-Conflict Mapping (VCM). • Multi-Screen Analysis (MSA). • TRIZ Laws and Trends of Evolution. • Line of Functionality Evolution. • Trends and Lines of Business Systems and Products Evolution. • Systematic Services Evolution. • Subversion Analysis. • Anticipatory Failures Analysis. • Business Models Navigator. • Diversification of Business Models and New Markets Discovery. • Business Innovation Roadmapping.

Today, these levels of competence are implemented in a training and certification program developed by the International Business TRIZ Association (IBTA) [9].

Currently, the following three groups of tools are in the program:

1. Tools of classical TRIZ which remained unchanged.
2. Adapted tools: classical and modern tools of technical TRIZ which were incorporated to Business TRIZ but underwent slight or serious adaptations.
3. New tools which were developed for Business TRIZ.

2.1 Adapted Tools

As mentioned above, adapted tools represent the largest group of TRIZ tools. They are listed in Table 2.

Table 2. Adapted tools of TRIZ

TOOL	CHANGE
40 Inventive Principles	Adapted version of 40 Inventive Principles for Business and Management
Contradiction Matrix by G. Altshuller	Business Matrix 3.0 (D. Mann) Innomation Matrix (D. Conley)
Cause and Effect Chain Analysis (CECA)	Root Conflict Analysis (RCA+)
Resources	Classification of resources for business and management
Function Analysis	Extended version: intangible objects; function formulation, etc.
Substance-Field Model and Standard Inventive Solutions	Object-Field Model; New classification of standard solutions; New system of standard solutions.
Function Oriented Search (FOS)	Updated a way a function is identified in business
Laws, Trends and Lines of Systems Evolution	Adapted version for business systems and products
ARIZ	Problem Solving process supported by different tools replaces ARIZ

To illustrate the changes, let us take a look at two most known problem solving tools of TRIZ: 40 Inventive Principles and 76 Standard Inventive Solutions.

In particular, a modified version of the most famous TRIZ tools - 40 Inventive Principles for eliminating technical contradictions, contains the following changes:

- Partly changed the content of each principle to adapt it to business terminology.
- Completely changed contents of Inventive Principles 8, 9, 12, 14, 18, 19, 28, 29, 30, 31, 36, 37, 38
- Changed the titles of Inventive Principles 12, 14, 18, 28, 29, 30, 31, 32, 36, 37, 38.
- In each principle were changed the quantity of subprinciples, and currently the system includes of 192 recommendations.

An example of an updated inventive principle #12 is shown in Fig. 5.

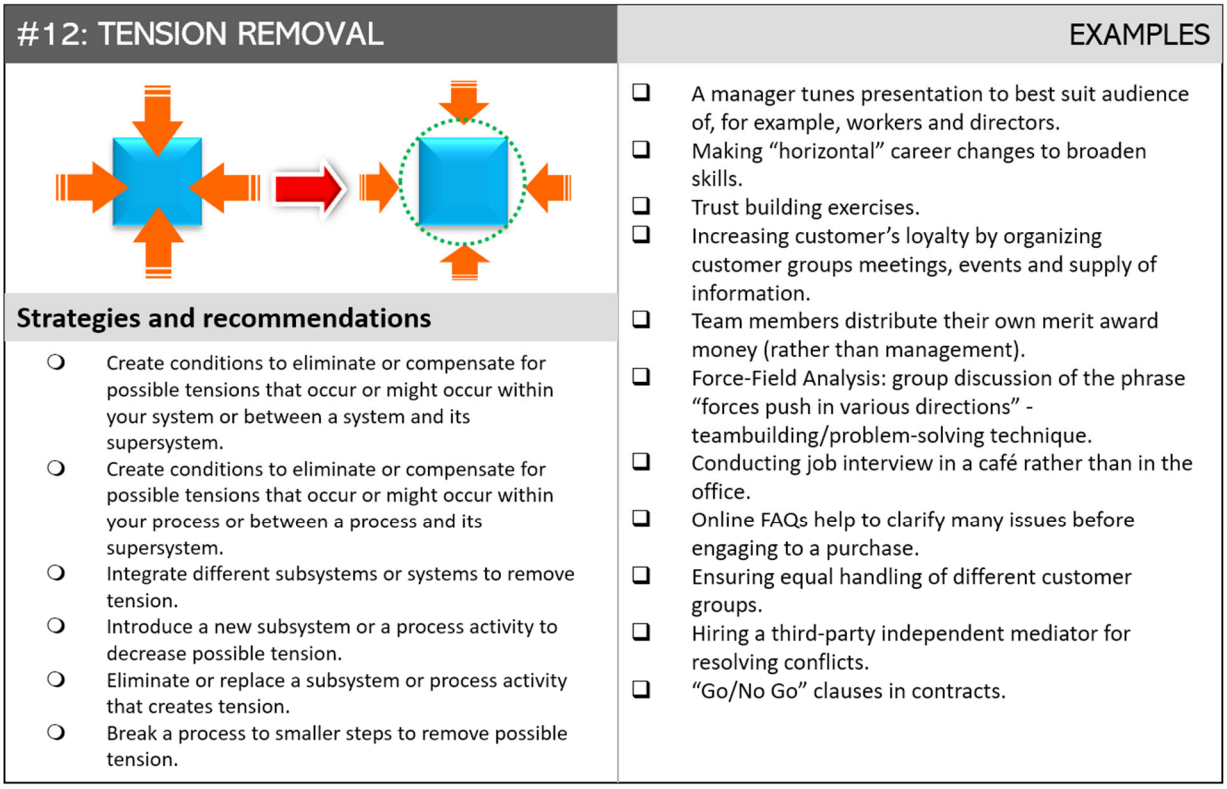


Fig. 5. An Inventive Principle for Business and Management.

Similarly, the new matrix of contradiction elimination for business and management is available and consists of 45 business parameters [10].

The same applies to what is known as "Standard Inventive Solutions". A classical TRIZ System of Standard Inventive Solution is based on a so-called "su-field" (substance-field) analysis and consists of 76 standard solutions. Although the approach can be effectively used for solving business and management problems, using the word "substance" would be obscure. Therefore a model was changed: rather that "substance-field", an "object-field" analysis is used.

Examples of two modified and adapted Standard Inventive Solutions for business and Management are shown in Fig. 6.

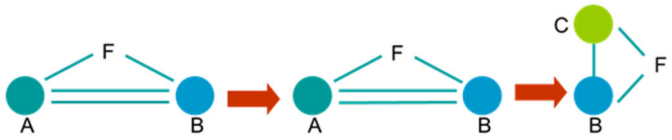
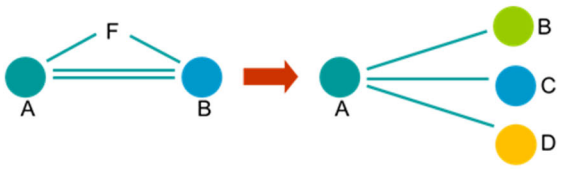
2-3	**If a precise effect of interaction between two objects A and B is required while the excessive interaction must be maintained, and it is difficult or impossible to achieve it under the conditions given, use the maximum action, while the excess of the action is then removed.**  Explanation: Often we cannot obtain optimal result directly. In such cases it is possible to use maximum action and then remove the excess.	*Example: If it is difficult to predict in which specific methods (A) to train employees (B), then train them in general methods which can be later adjusted to the specific needs of an organization (C).*
2-4	**If there is an excessive result of interaction between the objects A and B, introduce several objects instead of object B and redistribute action between these newly introduced objects. New objects can be identical or with biased parameters.**  	*Example: Too much diverse information (A) can make work of a business analyst (B) ineffective. Rather than using a single analyst with broad competence, several analysts with different narrow competences can be used.*

Fig 6. Two examples of Standard Inventive Solutions for Business TRIZ.

In addition, the inventive standards are grouped differently than in technical TRIZ. While in technical TRIZ they are grouped according the line of evolution of technical systems, in Business TRIZ, standard inventive solutions are grouped according to the type of problems they solve. In total, there are 5 groups of problems [11] (Fig. 7).

GROUPS:

- **Group 1: Improving insufficient effect of an interaction**
  - Standard 1-1: Transition to internal complex model
  - Standard 1-2: Transition to external complex model
  - Standard 1-3: Introducing intermediary
  - Standard 1-4: Using existing resource
  - Standard 1-5: Using modified or new environment
  - Standard 1-6: Transition to dual model
  - Standard 1-7: Transition to periodic action
  - Standard 1-8: Introducing selective protection
  - Standard 1-9: Introducing selective amplification
  - Standard 1-10: Segmentation of objects and processes
  - Standard 1-11: Increasing the degree of segmentation
  - Standard 1-12: Dynamization of objects and processes
  - Standard 1-13: Increasing the degree of dynamics
  - Standard 1-14: Transition to bi- and poly-systems
  - Standard 1-15: Increasing differences in bi- and poly-systems
  - Standard 1-16: Paradigm change
- **Group 2: Improving excessive effect of an interaction**
  - Standard 2-1: Introducing filtering
  - Standard 2-2: Modified environment
  - Standard 2-3: Action maximizing
  - Standard 2-4: Removing excess of action
- **Group 3: Improving poorly controllable effect of an interaction**
  - Standard 3-1: Introducing intermediary
  - Standard 3-2: Transition to external complex model
  - Standard 3-3: Replacing paradigm
  - Standard 3-4: Outsourcing to supersystem
  - Standard 3-5: Transition to chain model
- **Group 4: Eliminating negative effect of an interaction**
  - Standard 4-1: Introducing intermediary
  - Standard 4-2: Introducing modified intermediary
  - Standard 4-3: Neutralizing
  - Standard 4-4: Distraction by a new field
  - Standard 4-5: Introducing antipodal action
  - Standard 4-6: Modified object in advance
  - Standard 4-7: Withdrawing effect
  - Standard 4-8: Periodic action
  - Standard 4-9: High speed
  - Standard 4-10: Paradigm change
- **Group 5: Organizing or improving measurement and detection**
  - Standard 5-1: Problem change
  - Standard 5-2: Using a copy
  - Standard 5-3: Successive detection
  - Standard 5-4: Indirect resource measurement
  - Standard 5-5: Transition to a dual model
  - Standard 5-6: Transition to bi- and poly-systems
  - Standard 5-7: Measuring derivative

Fig 7. Current structure of a System of Inventive Standards

2.2 New Tools

In addition, new tools for Business TRIZ were developed. Some of them appear to be universal and can be applied to both technical and Business TRIZ [11]. They are listed in Table 3.

Table 3. New tools of TRIZ

TOOL	DESCRIPTION
Value-Conflict Mapping (VCM)	Enables extracting barriers to further evolution of a system or a service with regard to existing and forthcoming market trends and demands and presenting them in form of a contradictions tree
Multi-Screen Analysis (MSA)	Systematic comparison of previous and current generations of systems or processes and extracting future problems to solve related to Ideality-Value Formula
Root Conflict Analysis (RCA+)	Decomposes a problem given to a tree of interrelated causes and contradiction
Business Models Navigator	Identifies specific business models capable of eliminating typical business contradictions
Ideas Landscaping	Multi-criteria Decision Matrix and a set of layers to evaluate and select most promising solution ideas
Business Innovation Roadmapping	Approach to strategically plan a timeline of future innovations consisting of a number of layers (based on Dr. R. Phaal approach)

Descriptions of most of these tools are presented in [12].

Specifically, we can outline the tool "Business Model Navigator" which was developed to eliminate contradictions by replacing business model [13].

Summary

This paper was supposed to give a short overview of tools included today to the training and certification program of the International Business TRIZ Association (IBTA) which set up a goal to develop the top quality standards of training in TRIZ for Business and Management.

Taking to account relatively short time of implementing the program, IBTA looks forward to expanding its activities, in particular, accreditation of new trainers, thus gathering more customer feedback to improve its training program.

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