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Trained T5 Model for Automated Question Generation for L&D

At a Glance

A leading financial organization chose Harbinger to simplify the process of generating questions for their learning and development (L&D) team. We deployed a Text-To-Text Transfer Transformer (T5)-based solution which helped them automate question generation for their respective study materials. This trained T5 technology also enhanced learner experiences and engagement.

Key Highlights

- Training T5 model for question generation
- Using data cleansing to improve T5 model's performance
- Creating accurate and high-quality questions
- Employing multiple Python libraries and tokenization
- Covering input material's key concepts and learning objectives
- Providing customization and tracking capabilities to users

Business Need

Traditional methods of developing training content, such as surveys and focus groups, were time-consuming and often yielded limited insights into what employees wanted to learn.

Our client's L&D team faced issues with creating effective training materials that would address the diverse learning needs and preferences of employees, including making them adept at achieving financial compliances (as well as testing them on the knowledge).

About the Client

Our client is a leading financial organization with over 10,000 employees across different business locations. The organization has a diverse workforce with a centralized L&D department. The L&D team wanted to enhance the learning experience by incorporating questions into the study material to encourage active learning and retention. They wanted to explore machine learning to automate the creation of questions for their study material.

Business Need

The L&D team wanted to create a customized training question generation process. This would satisfy the specific needs of different employee groups and the overall organization. They wanted to generate high-quality, relevant, and diverse questions for assignments that cover the key concepts and learning objectives of each study material.

Concretely, they were looking for a system that integrates into the company's learning management system (LMS). They wanted to ensure that the generated questions are appropriate, clear, and effective in promoting active learning and retention. The idea was to automatically assign the training modules to the appropriate employee groups based on their roles, skills, and interests.

The L&D team needed a system that monitored and evaluated the effectiveness of the new training modules, especially the assignment-based questionnaires through various metrics, such as completion rates, performance outcomes, and employee feedback. This would enable them to continuously improve the training content and delivery based on the insights gained from the evaluation process.

Solution Details

Harbinger recognized the need to create effective training that would address the diverse learning needs and preferences of the client's employees, especially when it comes to assignment-based questions. We trained a T5-based model to automate their question generation process with utmost precision.

❑ Customized Training for Different Employee Groups

T5 technology uses tokenization to produce concise questions or fill-in-the-blanks by dividing the input text into smaller units (tokens). The T5 model then processes these tokens, analyzing patterns and relationships to generate questions. Tokenization involves separating the input text into:

- Words

- Punctuation marks

- Other linguistic components like prefixes and suffixes

T5 technology encodes these tokens into numerical representations that the model can manipulate to produce questions. By employing this method, T5 technology can create high-quality questions that cover the most important learning objectives and concepts of the input material, while also providing customization and tracking capabilities.

❑ Meeting Diverse Learning Requirements and Objectives

To create multiple-choice questions, Harbinger utilized various Python libraries in tandem with tokenization. The tokenization process breaks down the input text into individual words, phrases, or linguistic components that these libraries can handle. These tokens are then inputted into the question generation process.

T5 technology can use these tokens to create answer choices that are semantically linked to the question stem. This can be achieved through techniques like:

- Paraphrasing

- Synonym replacement

- Generating sentences that are similar in meaning to the input text

Overall, T5 technology can generate high-quality multiple-choice questions that span a wide range of topics and learning objectives by employing multiple Python libraries and tokenization.

Solution Details

❑ **Monitoring and Evaluating the Effectiveness of the Training Modules**

To ensure the model is trained on top-quality data and produces precise and relevant questions, data cleansing is a vital step when employing T5 technology for question generation. The data cleansing process involves:

▸ Eliminating irrelevant and redundant data from the training dataset

▸ Standardizing the input data's format and structure

▸ Removing any noise or errors that might impede the model's performance

Removing duplicate data from the training dataset is a crucial aspect of data cleansing in T5 technology. Duplicate data can bias the model's training and result in overfitting, which reduces its ability to generalize to new data.

Finally, T5 technology can apply methods such as lemmatization, stemming, and stop word removal to clean the data further and decrease noise or errors in the input text. These techniques ensure the model is trained on top-quality data that precisely represents the input material's content.

Overall, data cleansing is an essential step in the question generation process using T5 technology. It guarantees that the model is trained on high-quality data. It also guarantees that the model produces accurate and relevant questions covering the input material's most important concepts and learning objectives.

After implementing these critical steps, Harbinger ensured that Quillionz could generate various questions (short, long, MCQs) and their answers for different end users.

Unique Differentiators

- Training T5 model Quillionz for question generation

- Training the model on top-quality data

- Automating the question generation process

- Generating high-quality, diverse, clear, relevant, and accurate questions

- Addressing the diverse learning needs and preferences of employees

- Improving the creation and delivery of training modules

Technology

- Quillionz by Harbinger

- T5

- Python Libraries

Result

Integration of T5-trained Quillionz with the organization's LMS

Effective promotion of active learning and retention

Faster, scalable, and budget-friendly T5 model

Questions comparable in quality to those written by humans

T5 model that adapts to the specific needs of the organization and employees

T5 model tested by L&D on a subset of their study materials

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Scenario-Based Gamified Training for a Retail Chain's Drive-Thru Workforce

At a Glance

A US-based fast-food chain with 350+ outlets across the country used Harbinger's scenario-based gamification solution to train their staff. The game provided real-life experiences at a drive-thru counter. The game had two levels, namely 'Overview & Practice' and 'Practice Only' and rewarded learners with interesting badges like Time Champ, Hat Trick, Perfection, and Head Set Hero.

Key Highlights

- Gamified training with interactive scenarios
- Exposure to similar-to-life experiences
- Simulation of real-time customer experiences
- Simple and conversational narration style
- Applying learning in a realistic context
- Gamification for faster learning

Business Need

Employee turnover in the food industry is very high. Training costs are therefore very high. The client had some kind of video-based training already in place but it was not delivering the expected results. So, they were looking for something more engaging, motivating, and effective to train their drive-thru workforce. They wanted to implement a gamified learning experience to achieve their objective. They had even zeroed down on the content to be used from their service content manual.

About the Client

Our client is the owner and operator of some of the world's most successful restaurant brands, including the world's largest hot dog chain with 50+ years of proven success. This fast-food chain has 350+ outlets across the United States and serves 120+ million hot dogs a year. The bona fide pioneer of the quick-service food industry is famous for its delicious proprietary chili recipe.

Solution Details

At a drive-thru window, pressure can run high and even the smallest mistakes can prove catastrophic, backing up lines and spelling disaster for both customers and the restaurant. The client therefore wanted to train its workforce using similar-to-life experiences.

Keeping the subject, requirement, and the audience in mind, Harbinger proposed to use a scenario-based gamified approach which would expose the learner to real-life experiences at a drive-thru window.

The learning objectives to be achieved were outlined as follows:

- Demonstrate the sequence of the drive-thru service

- Recall the guidelines for a "wow" service

- Illustrate how to use the H.E.A.T steps (Hear them out; Empathize; Apologize; Take action) to resolve customer complaints

The game that was finally designed uses a very simple, conversational narration style, to simulate a real-time customer experience. An environment similar to the restaurant's drive-thru window and customer car queues is emulated graphically based on the photographs shared by the client.

The game has 2 levels.

❑ **Level 1**

Level 1 of the game has two parts: A screen giving a brief overview of the drive-thru service process and a practice section comprising interactive scenarios that provide learners with the opportunity to apply learning in a realistic context.

❑ **Level 2**

It is a practice only level and a more complex one. The learner has to again complete taking the order of minimum 3 guests with a maximum of 5 guests at the drive-thru counter. Each guest is required to be served in a total experience time of 3 minutes 30 seconds. The learner can achieve badges such as 'Time champ', 'Hat Trick' and 'Perfection' if one, three, or five customers are served in time and become a 'Head Set Hero'.

The run against time along with a WOW factor for extra scoring and 'Runner Charger' activation button takes the gaming experience to another level.

Project Screenshots

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Project Screenshots

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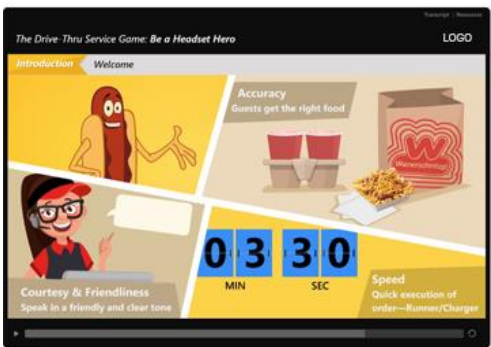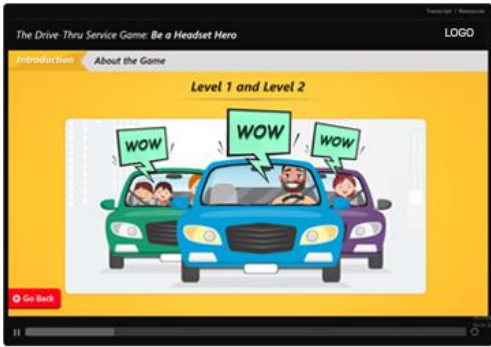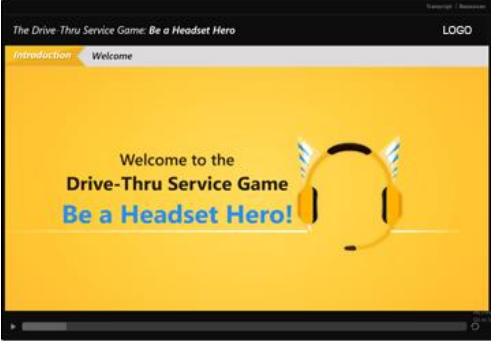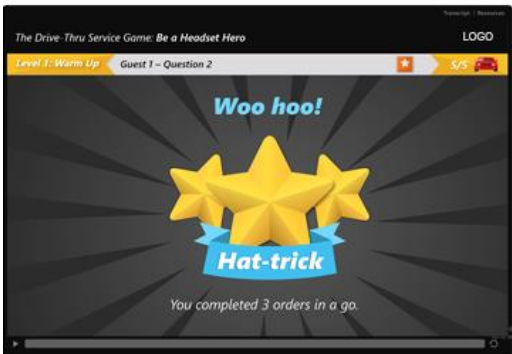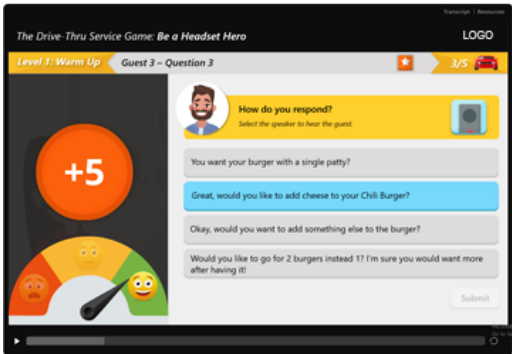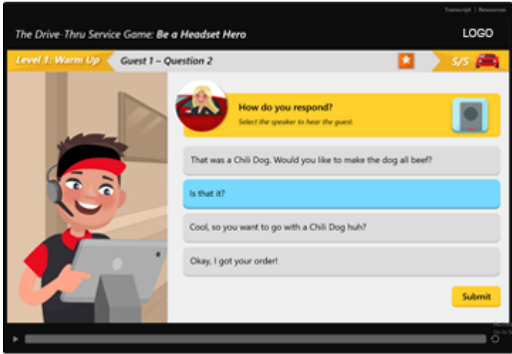
Result

Gamified training helped train a large audience

Improved training helped team members execute the brand standards at a higher level

Fun, simple, engaging, and motivating training module

Gamified training helped drive home defined learning objectives

New module helped new team members learn faster than the previous module

The module helped team members achieve perfection

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AI-Based Automated Custom Content Development for Educational Courses

At a Glance

Harbinger helped a technology institute automate the process of custom content development in video format. We created customized MP4 videos for their BCA and MCA higher education programs through end-to-end automation using OpenAI GPT-4 Turbo and Python scripting. We enabled AI-based automated content creation, script creation, and image search for custom MP4 videos.

Key Highlights

- LLM trained for instructional design (ID) thinking, with ID knowledge, efficiency, and experience fed to the model

- Quick turnaround of 30 days instead of 120 days to set up automation and execute the POC

- Minimum to no technical know-how required to teach using the custom MP4 videos created

- Easy course content navigation and maintenance for the university and their professors

- Future-ready content generation framework which can be reused and tweaked for eLearning

About the Client

A well-established technology institute that offers advanced higher education programs on par with international standards. Carrying the vision of transforming lives through excellence in education and research, it aims to create the leaders of tomorrow. It persistently adopts innovative measures to enhance the quality of higher education on a consistent basis. Its Memoranda of Understanding with multiple international universities allows its students and faculties to participate in joint research projects.

Business Need

Our client wanted to create online video-based course materials that are customized for their Bachelor of Computer Application (BCA) and Master of Computer Application (MCA) program curricula. They were looking for an automated solution that can fast-track this process and generate video content for their entire BCA and MCA curricula in less than 4 months.

There were 3 major challenges faced by our client when they approached Harbinger with their business requirement:

➢ Generation of an extremely large volume of video content
➢ Super-thin budget allocated to the project
➢ Tight deadline to develop custom videos for vast curricula

Solution Details

Harbinger analyzed the business needs of our client and offered an AI-based end-to-end automation solution that covered all stages of video content development – from content sourcing to content creation. This helped generate comprehensive custom MP4 videos for our client's exceedingly large BCA and MCA curricula.

An automated Harbinger IP framework was implemented to convert the curated content into well-structured PPTs and generate MP4 custom videos as the ultimate output. We used OpenAI GPT-4 Turbo for video content generation and trained AI to think like an instructional designer in the entire content development process.

We used the expertise of SMEs at critical stages of the automated video development process to validate the correctness and completeness of the custom videos being generated. We achieved greater content accuracy and reduced dependency on their university professors to review or validate the content.

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Solution Details

Auto-Generation of Interim Deliverables

Our client shared a brief session plan for each course included in their BCA and MCA programs. Based on this input material, Harbinger created well-structured, detailed, and accurate session outlines using its AI-based automated solution involving OpenAI GPT-4 Turbo. The session outlines included:

➢ Session topics

➢ Learning objectives

➢ Keywords

➢ Definition of key concepts

➢ Real-world applications

➢ Pacing and time allocation

➢ Additional notes

By using our AI-based solution involving OpenAI GPT-4 Turbo, we also automated the process of video outline, video script, and video content creation. All these interim deliverables (session outline, video outline, video script, and video content) were created using automation to define the structure of the MP4 videos generated for our client's BCA and MCA programs.

With OpenAI GPT-4 Turbo, we automated the process of creating and saving the interim deliverables in individual MS Word docx files. The content in these files was structured into a specific format that can be easily converted into PPTs through automation for final video creation.

The final custom videos were developed in MP4 format using AI-based avatar as a narrator with the help of Synthesia. Apart from narration, the process of royalty-free image search, generation, and placement based on specific keywords was automated.

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Unique Differentiators

- Video content equivalent to any human SME inputs

- Significant reduction in the use of resources

- AI trained on instructional design thinking

- Automation to handle sheer volume of video development

Technology

- OpenAI GPT4 Turbo APIs

- Python

- Synthesia

Result

80% automation of video development	Self-paced learning for university students
75-80% savings in time and efforts	No dependency on course instructors
4X faster turnaround and high cost-effectiveness	Higher accuracy of video content and curricula
Custom and comprehensive MP4 video content	Generation of assessments, quizzes, and case studies
Integration of hands-on activities in the videos	Easy content navigation and maintenance

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eLearning Course Modernization for a Catalog Learning Solutions Provider

At a Glance

A leading provider of state-specific legal compliance tools and training sought Harbinger's expertise to modernize their extensive eLearning catalog. We developed a comprehensive prototype, customized features, and implemented tailored solutions to deliver modernized, accessible, and consistently branded eLearning courses.

Key Highlights

- Migration of 500 courses to Articulate 360 with modern design and technology

- Compliance with accessibility standards across all updated eLearning courses

- Development and testing of prototypes for effective eLearning course modernization

- Comprehensive standards and documented guidelines to eliminate content gaps

- Well-strategized delivery of eLearning courses that were high in demand

About the Client

The client offers comprehensive, state-specific legal compliance tools and training for HR managers, employers, safety professionals, environmental compliance officers, and training development managers.

Business Need

The client had developed over 500 courses in Articulate Presenter in phases over the years. It was becoming critical for the client to keep up with changing technologies, advancement of devices, and the need for a modern learning experience for learners.

In addition to the demand on the delivery to be in synch with the trends, the intrinsic need of compliance content to be updated quickly and with minimal effort was a pressing requirement.

Specialists in the fields of environment, health, and safety maintained and updated the compliance material regularly. This training material needed to be updated for:

❖ The latest trends using an authoring tool that their L&D could easily adapt to

❖ Uniform branding across the courses

❖ Accessibility compliance

Solution Details

Harbinger helped the customer evaluate three different technologies to modernize the courses. The pros and cons for each were discussed in-depth before deciding on using Articulate 360 as the tool.

Listed below are few areas which ensured optimal development and delivery of the modernized courses:

❑ **Prototype**

A prototype of a few courses was developed first to ensure that there was a rigorous test of the product and processes. The standards and the expectations were finalized to create the foundation for volume turnaround.

❑ **Process**

The client had limited bandwidth, so it was desired to follow a process with comprehensive standards and documented guidelines. A simple process was defined to ensure that there was a balanced approach of updating the courses by making minimal changes to the content and at the same time content gaps, if any, were identified and filled-in.

❑ **Templates**

A wide range of templates were defined to accommodate all the types of screen in the legacy courses. Three sets of the templates with various designs helped in managing the variety in the courses. These templates were a common language across both the teams for defining the look-and-feel of the screens.

❑ **Customization of Articulate 360**

The client expressed the need to retain features like timer for the course progress and customized size of the transcript window, even though these features were not available in Articulate 360.

It was also required to customize the success criteria in the assessments across courses as they would be deployed in different companies with different policies. Harbinger found a solution to these challenges in using JavaScript. It enabled achieving the mentioned features through back-end programming.

Solution Details

☐ **Delivery**

The client was not burdened with volume deliveries; instead, Harbinger was flexible enough to ensure that the courses were delivered as per their business requirements. The launch of courses that were in high demand was selected as a priority. Robust training was arranged for the client's staff for implementation of the customized features.

Harbinger adapted to all bandwidth constraints at the client's end. We took up the role of reviewers' team on their behalf end and filled-in when the client needed specialized skills like need of a project manager.

Here are some screenshots:

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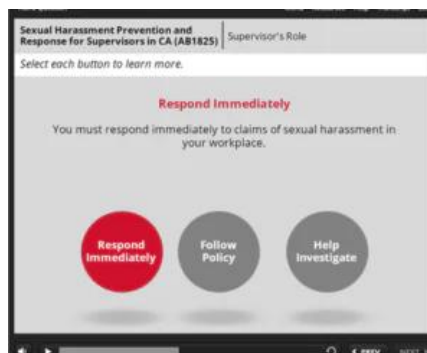
Unique Differentiators

- Creation of tailored templates to accommodate diverse eLearning course designs

- Use of Articulate 360 and JavaScript to retain features like timer and transcript window

- Flexible eLearning course delivery as per business priorities to reduce client workload

- eLearning course modernization with minimal content changes and flexible delivery options

Result

Effective modernization of eLearning course library

Increased learner satisfaction through improved course design and aesthetics

Ready-to-use library of 50+ templates for future in-house course development

Scalable and rapid course development with reusable templates

Unified learning experience with consistent and solid business branding

Improved ability to maintain and evolve course offerings independently

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Competency Assessment to Identify Skills Gap for Targeted Training

At a Glance

A renowned organization specializing in heavy vehicle driver training collaborated with Harbinger to elevate their training program with a competency-based learning approach. Harbinger implemented a pre-assessment tool to determine competency gaps, enabling personalized learning paths. Our solution ensured targeted skill enhancement for learners, improving their knowledge about safe driving before licensing exams.

Key Highlights

- Creation of a pre-assessment for competency evaluation across 12 driving skills

- Customized learning modules triggered based on competency gaps

- Interactive video-based assessments analyzing reaction time and proficiency

- Real-time data integration with internal LMS

- Implementation of Harbinger's competency-based learning framework

About the Client

A global organization that trained learners on best practices, rules, and regulations for heavy vehicle driving before the license test. The driver took this program to improve their knowledge of various driving conditions before attempting the license test.

Business Need

Our client required an innovative training program that helps ensure the safety of heavy vehicle drivers, minimize risks, and reduce overall liability.

Solution Details

The customer had developed video learning content for each competency. Instead of the standard methodology of opening all learning modules for every learner, the video-based learning modules were planned to be opened based on competency gaps. These learning modules of the program were stored on the client's LMS as SCORM packages.

The program had 2 main components:

➢ A pre-assessment that tested the learner's current knowledge and proficiency on 12 driving competencies.

➢ Focused learning modules that provided training for each of the 12 competencies.

The assessment had 2 types of questions:

➢ Interactive video-based questions mapped to the competencies which tested aspects such as the learner reaction time and recognition, which are critical for determining competency.

➢ A set of multiple-choice questions that tested the learner knowledge level around that competency.

Once all the questions were attempted, based on the learner responses and the reaction time, the competency level (early, intermediate, advanced) was calculated and shared as a percentage.

The assessment score is calculated as a breakdown of the questions along with details such as reaction time, number of incorrect attempts, correct answer expected, and so on.

Along with the individual competency score breakdown, the assessment also calculated an overall combined % score of various competencies which is then sent to the LMS.

Since the LMS was a traditional one, Harbinger used its competency-based learning framework which stored the assessment questions and content tagged with their competencies in a JSON file.

Solution Details

The individual competency scores were then used to open training modules for the learner. The competencies with the lowest percentage scores were noted, and respective learning modules opened for the learner on priority. Modules for competencies with higher scores were opened later.

As the learners completed the modules at their own pace, the subsequent modules would open for the learner after a set time lag. When the learner completed all the modules, the course was marked as complete on the LMS.

Here are some screenshots:

Unique Differentiators

- Tailored video-based learning modules to address individual competency gaps

- Competency-based assessment and knowledge sharing for precise skill evaluation

- Dynamic module progression based on learner's pace and performance in real-time

- JSON-based framework for efficient learning content delivery through the LMS

Result

Enhanced skills and knowledge in safe driving	Personalized training modules for optimized learning efficiency
Better training and learning outcomes	Holistic and comprehensive training program delivery
Improved driving performance and test results	Elevated safe driving standards through competency-based learning

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Design and Implementation of Custom Headless ALM for Extended Enterprise Training

At a Glance

The world's leading designer, manufacturer, and marketer of access equipment chose Harbinger to design, develop, and implement Adobe Learning Manager (ALM) for extended enterprise training. Harbinger helped them develop a headless user interface and implement ALM to streamline training for their esteemed customers, partners, and vendors.

Key Highlights

- Development of custom Headless ALM user interface
- Implementation of eCommerce functionality with payment gateway integration
- Implementation of bulk course license purchasing functionality for the employees of extended enterprises
- Automated digital operator ID card generation
- Implementation of training management console
- Development of instructor finder map functionality
- Training course content and learner data migration

About the Client

Our client is the world's leading designer, manufacturer, and marketer of access equipment.

The company delivers powerful and versatile access equipment along with industry-leading equipment training programs backed by the latest ANSI and OSHA regulations.

Since 1969, they have been supporting customers, surpassing training and service, improving product efficiency, and ensuring safe equipment handling across teams.

Business Need

Our client followed a traditional format for providing online and in-person equipment handling training to their extended enterprise ecosystem including customers, partners, and vendors. Our client used their in-house LMS to manage and deliver eLearning content around their products. They also used a learner dashboard to help learners access and track operator training.

After completing the online training, learners used to meet the instructors for in person training on the products/equipment's. Once they had completed the online and in-person training, learners were certified to operate the equipment. An ID card was also issued to indicate that they were certified to operate the equipment.

With in-depth analysis, our client found out that their extended enterprise training format was unable to meet the evolving needs of modern learners. They identified that their training process had a few loopholes and was manual, complex, and time-consuming.

❖ Unavailability of Unified LMS

Learners needed to use two different portals for their training: one portal was used to deliver courses and another to find the best instructor and coordinate with them for in-person training.

❖ Absence of eCommerce and Payment Gateway

Learners were required to make payments offline to enroll in their preferred courses.

❖ Lack of Multiple License Purchasing Feature

There was no option in the extended enterprise training system for the extended enterprise team to purchase multiple licenses and assign them to their team members.

❖ Manual ID Card Generation

After a learner completed a certification, their information was sent to a printer operator using an MS Excel spreadsheet via email. The printer operator used this data to print ID cards and hand them over to the certified learners in person.

As such, our client sought to advance their extended enterprise training ecosystem. They wanted to enable seamless learning experiences by streamlining eLearning content delivery. Their ultimate goal was to replace their two online training portals with a unified LMS. They also wanted to embed eCommerce functions while effectively hosting digital content and delivering equipment training.

On the other hand, our client was looking to reduce the equipment training cost. The idea was to simplify training delivery, automate administrative processes, and ensure effective learning outcomes for all customers, partners, and vendors.

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Solution Details

After analyzing the overarching business requirements of our client, Harbinger helped them establish a crowdsourced system to accelerate their extended enterprise training, advance eLearning content delivery, and maximize business growth.

Harbinger successfully implemented ALM to support our client's trainer network. Our team enabled end-to-end design and development of custom headless ALM. The newly developed extended enterprise training system was backed by the following capabilities:

Development of New Extended Enterprise Training System

❑ Centralized Multitenant LMS

Harbinger combined the critical aspects of our client's online learning portal and learner dashboard by building a multitenant LMS for their extended enterprise training system.

The solution supported different mobile devices with added tracking and reporting functionalities to ensure operator compliance and data traceability. It provided learners with a unified platform, enabled paperless learning, and reduced training cost.

Centralized LMS helped the learners take full advantage of the following functionalities:

- ➤ Landing page - login/logout
- ➤ Search, view, and launch courses
- ➤ Course content, learning paths, modules, training progress, and discussion forum
- ➤ Find an instructor via a map
- ➤ View grades, course completion reports and certificates, and an option to order operator/instructor ID Cards
- ➤ Automatic enrollment in the next course with a theory score above 80%
- ➤ eCommerce, payment gateway, and checkout pages

❑ Successful ALM Integration

Harbinger integrated ALM into the extended enterprise system of our client. With the help of ALM integration, learners were able to effectively log in to our client's new unified LMS. They could view the list of enrolled and catalog courses available to launch.

Learners were able to view the course details, start the course, and monitor its progress. They could view their profiles and log out of the web application, thereby clearing their sessions from ALM.

Development of New Extended Enterprise Training System

❑ **Advanced Instructor Finder Map**

Harbinger developed and integrated a feature that assists learners in finding the right instructors. Once learners complete their online training, they could utilize this feature to search for nearby instructors based on their geolocation, communicate with them, schedule a time slot, and receive in-person training.

When instructors were offline or unavailable, the instructor finder map feature notified them via email. This feature facilitated and tracked two-way interaction between instructors and prospective learners via chat.

❑ **Seamless eCommerce and Payment Gateway Integration**

Harbinger integrated new LMS with eCommerce and payment gateway. With this integration, learners could visit the LMS, make payments online, and enroll in desired training courses. As a part of the eCommerce functionality, our team also built a coupon/discounting system.

Through this coupon/discounting system, admins were able to generate discount coupons that learners used to get a discount on the courses they intended to take. Admins could extend the validity of these coupons. Other capabilities include the following:

➢ Manage discount coupons through Create, Read, Update, and Delete (CRUD) operations
➢ Track and report consumption of discount coupons
➢ View the course list to purchase courses
➢ Select and add courses to the shopping cart
➢ Manage licenses for rental centers, learners, instructors, and admins
➢ Check out and process payment transactions
➢ Enable account billing by invoice

Development of New Extended Enterprise Training System

❑ Sophisticated Bulk License Purchasing

Learners from the extended enterprises had the flexibility to purchase any number of licenses to meet the equipment handling training requirements of their organizations. They could utilize these licenses to enroll team members in specific courses, certifications, or training programs.

Implementation of the bulk license purchasing feature eliminated the need for individuals to purchase their own training license. It allowed managers and organization heads to centrally purchase licenses and distribute them among their employees.

Admins can oversee the allocation of licenses, monitor their usage, and revoke or reassign them as needed to ensure efficient license utilization across their organizations.

❑ Streamlined ID Card Generation and Verification

Harbinger automated the ID card generation process for the client. Learners could now access the system, complete their course, and have their training record printed on their ID card. They also have the option to download a digital version of their ID card.

This feature eliminated the need to rely on printer operators and allowed learners to view their ID cards on-screen. It automatically updated the ID card when learners obtained certification in another machine type.

Harbinger simplified the ID verification process. For instance, if a certified boom lift operator visited a field to operate a machine, the on-field engineer could easily verify their identity. By entering the unique ID from the ID card into the system, the engineer could confirm whether the person was authorized to operate the machine. Other critical functionalities are as follows:

- ➢ Toggle visibility to obtain ID cards with course completion performance of more than 80%
- ➢ Allow learners to order and replacement ID cards
- ➢ Revoke access to certification training materials when a certificate of training expires
- ➢ Allow access to the platform and training records
- ➢ Allow learner/instructor ID details to be reviewed by manager/instructor/learner
- ➢ Integrate with third-party API to share details for ID card generation
- ➢ Receive payment for all ID cards via the custom payment gateway integration

Development of New Extended Enterprise Training System

❑ **Personalized Training Management Console for Instructors**

Implementation of ALM for extended enterprise training helped instructors support multitenancy and leverage custom out-of-the-box capabilities. They could perform the following tasks with ease:

➢ Edit learner profiles
➢ Change learner passwords
➢ Enroll learners in courses/programs
➢ Download learner certificates
➢ Remove learners assigned to them
➢ Run learner completion reports
➢ Select and add courses to shopping cart

❑ **Integrated Training Management Console for Managers**

Managers can perform the following for instructors and learners assigned to them:

➢ Create courses for instructors
➢ Assign instructors
➢ Enroll learners in courses/programs for all instructors
➢ Run learner completion reports
➢ Select and add courses to shopping cart

Unique Differentiators

- Unification of online learning portal and learner dashboard through a centralized LMS.

- Implementation of ALM to host digital content and deliver equipment training.

- Design and development of custom multitenant headless UI for ALM.

- Focus on extended enterprise training for customers, partners, and vendors instead of internal training.

- Integration of eCommerce and payment gateway into the new centralized LMS.

- Transition from offline to online training and eLearning content delivery.

Technology

- ALM

- Next.js

- Node.js

- Azure

- Bambora

- Okta

Client Testimonial

"Harbinger was helpful in bringing our product and its experience to life. Their team has been extremely patient. They have helped us expand our vision. The talent that has been brought to bear with Harbinger was very supportive. The experience was positive. This is a long-term partnership. We want to raise the bar and level of innovation in this industry and partner with Harbinger."

- Senior Director, Global Product Training, Access Equipment Manufacturer

Result

Increased revenue with better penetration of products into the market

Accelerated extended enterprise training process and functionalities

Reduced manual intervention and extended enterprise training cost

Simplified administration operations and broader audience reach

Seamless delivery of extended enterprise training modules

Quick search of qualified instructors for in-person equipment training

Enhanced training experience, engagement, and involvement of learners

Easy search and access to the desired eLearning content

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AI-Powered Voice-Enabled Chatbot for Employee Performance Support Transformation

At a Glance

The world's largest hot dog chain approached Harbinger to maximize performance support for its floating staff. We helped them build an AI-powered voice-enabled employee performance support chatbot to avoid manual query resolution and the constant churn of employees. Our AI-based solution automated employee assistance, improved performance, fast-tracked response generation, and delivered seamless employee experiences.

Key Highlights

- ⬠ Development, training, and fine-tuning of AI chatbot
- ⬠ Multilingual employee support for query resolution
- ⬠ Alexa and conversational AI for hands-free assistance
- ⬠ Advanced document processing for massive data stack
- ⬠ Dynamic data search and filtering for error-free results
- ⬠ Cutting-edge features for staff performance tracking

About the Client

Our client runs the world's largest hot dog chain in the US with 50 years on proven success. Founded in 1961, they have 300+ quick-serve restaurants in 11 states that effectively serve more than 120 million hot dogs a year.

The company is committed to partnering with exciting brands and hosting events in the music, fashion, and sports industries to make a difference. Their business leaders believe in serving up craveable food at a great value for many generations to come.

Business Need

Our client provided training to its floating staff on standard operating procedures, policies, and recipe preparation guidelines. However, assimilating a multitude of information regarding the workflow was challenging for employees.

During peak hours, their support center was overwhelmed with multiple calls, leading to delays in resolving employee queries. This led to a recurring issue of high employee turnover.

On the other hand, many of the franchisee employees were Mexican and preferred query responses in Spanish. The franchisee wanted to introduce a customized functionality that allows employees to receive responses in Spanish. Their objective was to ensure ease of work, employee satisfaction, and productivity.

As such, the company sought to accelerate their employee performance support process. They wanted to generate multilingual and more accurate query responses for their employees. Their aim was to create a standardized response generation procedure as per the proprietary documents.

Some of the other key business requirements of our client were as follows:

➢ Automate query resolution mechanism to provide 24/7 employee performance support.

➢ Keep a track of the types of queries, responses generated, and employee engagement.

➢ Build a hands-free system to ask questions and receive immediate verbal responses.

➢ Avoid the involvement of high-priced support experts and translation professionals.

➢ Handle a high volume of queries with utmost precision and minimal human intervention.

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To overcome such critical challenges and meet essential business requirements of our client, Harbinger developed an AI-based voice-enabled chatbot. This advanced technology solution was built in five consequent phases.

Development of AI-Based Voice-Enabled Chatbot

❑ **Engineering and Training of AI Model**

Harbinger developed and trained an AI model based on our client documentation consisting detailed instructions to carry out assigned tasks. This AI model was integrated into a chatbot accessible to franchisee employees at the point of sale or within the company system where they were logged in.

The AI chatbot provided two key benefits to the franchisee employees:

➢ It delivered direct answers to employee queries.

➢ It directed employees to the specific document where the answer was found, allowing them to gain a deeper understanding of the instructions and procedures.

❑ **Fine-Tuning of AI Chatbot**

Harbinger integrated the AI-based chatbot with 'thumbs up' and 'thumbs down' feedback options. This helped identify whether the responses provided to the employees by the AI chatbot were helpful and accurate.

Harbinger gathered this feedback and analyzed the instances of thumbs down. The AI chatbot was fed with the right answers and trained on certain instances to provide employees with relevant responses.

❑ **Multilingual Response Generation**

Harbinger integrated the AI chatbot with Spanish language support. The integration eliminated language-specific document constraints to enable cross-language interactions. Employees could ask questions in Spanish and receive responses based on an English knowledge base, with the final output in Spanish.

In the same way, the AI chatbot accepts queries and provides accurate responses in various other languages.

Development of AI-Based Voice-Enabled Chatbot

❑ **Implementation of Dashboard and Analytics**

Harbinger integrated the AI chatbot with a dashboard backed by sophisticated reporting and logging mechanisms. It involved analyzing employee interactions and system behavior.

The information was used to create reports enclosing the list of queries requested and responded to and from different locations and devices.

❑ **Integration of Alexa Skills and Conversational AI**

Harbinger integrated the AI chatbot with Alexa Skills. The integration helped our client's floating staff receive immediate answers to their queries in natural language.

Through Alexa Skills implementation into the AI chatbot, our team created an AI-based voice-enabled system to strengthen employee performance support.

Harbinger fine-tuned the Alexa Skills to automate the voice command-based support as per our client knowledge base. The process involved setting up interaction models, specifying the trigger phrases, and optimizing the user experience for Amazon Echo Dot.

This phase focused on the following key aspects:

➢ Comprehensive analysis of knowledge base for employee support.

➢ Utilization of Alexa Skills for instant verbal response to queries.

➢ High natural language accuracy for specific terms and instructions.

➢ Conversational AI interface to reduce employee time and effort.

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Development of AI-Based Voice-Enabled Chatbot

Harbinger's AI-based voice-enabled chatbot is supported by various advanced features and functionalities such as:

❖ Intelligent Document Processing

Harbinger's AI-powered voice-enabled chatbot enabled advanced document processing to manage and utilize the vast volume of data available in the proprietary documentation. This intelligent document processing feature is backed by the following capabilities:

- **Tracking and Management:** The chatbot automates the process of tracking newly uploaded and modified documents, ensuring it always references the most current information.

- **Enhanced Searchability:** The chatbot analyzes documents to improve searchability, allowing employees to receive responses they need more quickly and efficiently.

- **Content Mapping:** The chatbot maps indexed document content with the original documents, including specific pages and sections, responding to employee queries with the most relevant and detailed information.

❖ Smart Search and Filtering

Harbinger's AI-powered voice-enabled chatbot leverages a sophisticated datastore capable of advanced text data search. It enables precise information retrieval by searching through documents and delivering exact answers to employee queries. It also allows smart filtering using dynamic attributes and search criteria.

❖ Robust Conversational AI Interface

Harbinger's AI-based voice-enabled chatbot is built with a robust conversational AI interface, designed to deliver natural language interactions. This functionality provides employees with immediate, hands-free verbal responses. It's optimized for high accuracy, especially when dealing with specific terms and instructions, boosting staff operations and competence.

Unique Differentiators

- Precise AI model development, training, and fine-tuning to generate error-free employee query responses.

- The chatbot is scalable enough to handle a high volume of queries, ensuring consistent performance even during peak times.

- A dashboard with robust reporting tools analyzed employee interactions, helping refine and optimize the system over time.

- The chatbot employed advanced NLP techniques to understand and respond to natural language inputs with high accuracy.

- The chatbot automates routine query resolution to reduce the need for high-priced employee support experts.

- The chatbot delivers accurate responses as per client database, keeping it secure and isolated from unwanted or external sources.

Technology

- AI

- ML

- Alexa Skills

Client's Response

"The AI-based voice-enabled chatbot has been a game-changer for me. My staff use it every day, and they feel it's like having a personal assistant at their fingertips. It's so intuitive and reliable. Alexa responds quickly with exactly what I need. It has made my daily routine so much smoother! The chatbot has simplified my operations. Whether I need quick facts or reminders, Alexa always delivers, and is super reliable."

- Manager of Training and Development, Hot Dog Chain

Result

Enhanced query resolution with 92.5% success rate

High natural language accuracy for specific instructions

Achieved more than 90% accuracy of query responses

Increased time savings and reduced training costs

Improved employee performance and engagement

Enhanced accessibility and usage of the AI chatbot

Automated, faster, and verbal response generation

Faster, paperless, and cost-effective training system

Contextually-appropriate and precise punctuation

Personalized learning experiences for global teams

Wish to know more?

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