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Innovation and Technology Trends: A Compendium of Articles in Forbes

2018–2024

By Boris Kontsevoi President & CEO Intetics Inc.

Introduction

In today's world, technology drives everything forward, evolving so rapidly it's nearly impossible to keep pace. Yet, it's within this constant disruption that the greatest opportunities emerge. At Intetics, we've spent over three decades mastering this momentum, crafting tailored software solutions that not only meet but consistently exceed the demands of modern business. Our approach centers on understanding the unique challenges our clients face and delivering the perfect combination of technology, talent, and innovation to solve them.

This eBook brings together insights I've shared through the Forbes Technology Council, exploring critical industry shifts. From the rising need for automation to the transformative effects of artificial intelligence and IoT, we're entering an era where digital transformation is no longer optional—it's essential. What excites me most is how technology, when harnessed effectively, has the power to tackle the most complex problems businesses encounter today.

These articles aren't theoretical—they are rooted in real-world experience, reflecting the challenges our clients confront every day. Whether it's recruiting top talent, managing tight deadlines, or controlling development costs, we've repeatedly seen companies grapple with these issues. Through our tailored services—be it custom software development, building software teams, or providing pioneering digital solutions—we've helped organizations scale swiftly, operate efficiently, and innovate with purpose.

I encourage you to take these insights, apply them to your unique situation, and reach out if you need support. The future belongs to those who are not just reactive but proactive in shaping their digital landscape. We're here to help you do just that.

Thank you for your interest, and I hope you find these perspectives valuable.

Boris Kontsevoi
CEO & President of Intetics

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2024 Collection

INNOVATION

Can We Predict The Unpredictable? How Data Analytics Is Driving Smarter Crisis Response

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Oct 14, 2024, 10:15am EDT

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In an era where the unexpected is becoming the norm, the ability to anticipate and prepare for future events is more critical than ever. The global cost of natural disasters is staggering, reaching an estimated $250 billion in damages in 2023 alone, with climate-related crises like wildfires, floods and storms contributing significantly. In a world where a few days of foresight can save lives and billions of dollars, predictive analytics is emerging as a game changer.

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Traditionally used in fields like finance and marketing, predictive analytics is now reshaping the way industries and governments respond to crises. By leveraging historical data, artificial intelligence (AI) and machine learning (ML), predictive models can forecast risks and provide actionable insights in real time. Nowhere is this transformation more evident than in the management of natural disasters like wildfires, where predictive analytics is being used to not only forecast fires but also mitigate their devastating impact.

Predictive Analytics In Wildfire Control

One of the most memorable experiences I had with predictive analytics came during a project aimed at tackling the growing threat of wildfires—a crisis that's becoming more severe as climate change escalates. Each year, wildfires destroy millions of acres of forest and cause billions of dollars in economic damage. The urgency of finding a more effective way to manage these disasters was palpable.

To tackle this, a project was developed to create a predictive model that could forecast wildfire spread. The objective was to improve interactive fire and smoke maps using real-time data, giving public safety officials and residents in high-risk areas the tools to make informed decisions and act quickly.

By combining machine learning algorithms with computer vision techniques, the model achieved impressive accuracy in predicting fire movement. It aggregated data from various sources, including Google, the U.S. Geological Survey (USGS) and the National Interagency Fire Center (NIFS), to generate detailed fire perimeter maps. These maps provided crucial information for predicting how long it would take to control a fire in specific areas, aiding in evacuation planning, resource management and public safety efforts.

Furthermore, the model forecasted smoke dispersion, allowing communities far from the fire's origin to prepare for air quality issues. The ability to predict both the fire's path and the spread of hazardous smoke enabled more efficient planning and reduced the overall impact on public health.

Seeing this predictive system in action made me realize the profound impact analytics can have on crisis management. We weren't just reacting to fires; we were staying ahead of them, using data to anticipate what might happen next.

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Data: The Backbone Of Predictive Analytics

The effectiveness of predictive analytics largely depends on the availability and quality of data. In the aforementioned wildfire management project, a significant challenge was aggregating real-time data from various sources and ensuring its accuracy. The team behind the project used a combination of public data feeds and geospatial solutions to compile the necessary information for fire spread predictions.

This points to a critical requirement for successful predictive models: the integration of comprehensive datasets. Inaccurate or incomplete data can lead to flawed predictions, which in crisis situations, could have dire consequences. Therefore, ensuring data integrity and proper validation processes are essential steps in building reliable models.

As technology evolves, the ability to leverage more sophisticated datasets—such as drone footage, satellite imagery and real-time IoT sensor data—will only improve the accuracy and applicability of predictive models in crisis management.

Expanding The Role Of Predictive Analytics In Crisis Management

While wildfire management is a striking example of predictive analytics in action, the technology's potential extends far beyond fire-prone regions.

In flood management, for instance, predictive analytics analyzes historical rainfall, river levels and geographical data to forecast when and where flooding is likely to occur. This enables earlier evacuation orders, more efficient allocation of resources and the reinforcement of critical infrastructure before disaster strikes. In fact, a report from the National Institute of Building Sciences found that every $1 spent on disaster preparedness saves $6 in recovery costs.

The power of predictive analytics isn't limited to natural disasters. In humanitarian efforts, technology can forecast food shortages, population displacement and resource scarcity, ensuring aid is delivered where it's needed most. For example, in 2020, the World Food Programme reported that predictive analytics helped save millions of dollars and thousands of lives by pre-positioning supplies in vulnerable regions ahead of crises.

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Similarly, during the Covid-19 pandemic, predictive analytics played a critical role in tracking the spread of the virus. By analyzing vast datasets, governments and healthcare systems were able to allocate essential resources like hospital beds, ventilators and vaccines more effectively. As public health challenges continue to evolve, the ability to make timely, data-driven decisions will be essential in managing future crises.

The Challenges And Future Of Predictive Analytics

Despite the significant benefits of predictive analytics, challenges remain. One of the most pressing concerns is ensuring that the data used in predictive models is free from bias and represents diverse populations. In crisis management, where decisions directly affect vulnerable groups, it's crucial to maintain fairness and accuracy in predictions.

Another challenge is accessibility. While large organizations and governments have the resources to implement cutting-edge predictive analytics solutions, smaller entities may not. As technology becomes more widespread, creating affordable, scalable solutions for smaller organizations will be essential.

Looking to the future, the potential of predictive analytics in crisis management is immense. As machine learning and AI technologies continue to improve, predictive models will become more accurate, helping decision-makers respond to increasingly complex challenges.

Conclusion

Predictive analytics is revolutionizing the way we manage crises, from natural disasters to public health emergencies. By turning data into actionable insights, predictive models enable governments, businesses and organizations to anticipate challenges and respond proactively.

As we continue to harness the power of data, predictive analytics will play a key role in building a more resilient, informed and prepared future.

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INNOVATION

Is C2C Dying? A Critical Look At Corporation-To-Corporation Benefits

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Jul 19, 2024, 07:00am EDT

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In today's information technology landscape, businesses are challenged with increasing IT spending while optimizing operations and controlling costs. Central to this challenge is the need for tech expertise and engineering capabilities. With IT specialist demand expected to grow by 25% between 2022 and 2032, hiring skilled tech professionals is increasingly costly.

For instance, the Total Cost of Ownership (TCO) for a Senior Software Developer in the USA includes more than just the base salary. The average salary is $132,115 annually. Other costs include:

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- Benefits and taxes: $40,630

- Bonuses and equity: $35,000

- Overhead costs (office, hard/software, admin, training, etc.): $39,000

- One-time costs (recruitment, onboarding, termination): $4,880 per year (assuming 10-year tenure)

These figures are illustrative and may vary based on specific circumstances and organizational factors. Altogether, these components bring the total annual cost of hiring a senior software developer directly to approximately $251,625.

But what if you could cut those costs in half? How would you use the savings?

In this article, I discuss corporation-to-corporation (C2C) arrangements as an effective alternative to direct hiring, highlighting their significance, benefits and operational aspects.

C2C Vs. Direct Hiring: Maximize Efficiency And Minimize Risks

C2C hiring is a smart employment strategy that provides companies with a flexible workforce while bypassing many of the costs and responsibilities of traditional employment. Here's how C2C stands out over direct hiring:

Cost Savings: Direct hiring comes with costs beyond salaries, such as benefits, taxes and overhead tied to full-time staff. C2C contracts can significantly cut these expenses, enabling businesses to use their resources more efficiently.

Flexibility: C2C offers significant flexibility, allowing businesses to bring in specialized skills for specific tasks without long-term commitments. This adaptability is especially crucial in the fast-paced tech industry.

Risk Mitigation: In C2C arrangements, contractors handle workplace issues and compliance with labor laws, reducing the client's risk. Direct hiring places this burden on the employer, increasing administrative and legal risks.

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- **Access To Expertise:** Direct hires may lack the precise skills needed for specialized projects, leading to additional training costs and delays. C2C provides access to highly specialized professionals ready to deliver from day one.

- **Growth Opportunities:** C2C contractors operate as business entities, allowing them to expand their services, attract more clients and even hire their employees. This entrepreneurial spirit fosters innovation and efficiency.

- **Quality Of Service:** The C2C model enables corporations to focus on their areas of expertise and collaborate effectively, leading to improved service quality. Direct hiring can sometimes result in skill mismatches and suboptimal performance.

Leveraging the strategic benefits of C2C can be an attractive option for companies aiming to reduce costs and boost efficiency, reducing the overhead of traditional employment models.

Rethinking Direct Hiring: How C2C Offers Significant Value

Direct hiring is often seen as beneficial for long-term commitment, cultural alignment and career development. However, C2C arrangements can provide equal, if not greater, value in these areas. Here's how modern sourcing models that blend C2C advantages with an employee-centric approach excel in these key aspects:

- **Long-Term Commitment:** C2C arrangements support building long-term relationships between contractors and companies. These models can foster loyalty and commitment like direct hires, especially when companies engage contractors on long-term projects. This can lead to high levels of engagement and retention, as contractors often become integral parts of the team over time.

- **Company Culture:** C2C can ensure that contractors align with the company's values and culture. Modern sourcing models emphasize cultural fit during the selection process, ensuring that contractors are well-integrated and collaborative within the organization. This alignment can lead to improved teamwork and a cohesive work environment.

- **Career Development:** C2C offers significant opportunities for career growth and advancement. Contractors in C2C models often invest in training and development

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programs to enhance their skills and reach their full potential. This investment can result in higher job satisfaction and motivation, as contractors feel valued and supported in their professional development, similar to direct hires.

Key Considerations Before Choosing C2C

Deciding between C2C arrangements and other hiring models can be complex. Here are several factors to guide your decision:

- **Cost Analysis:** Evaluate salaries, benefits, administrative expenses and potential savings with contractors. This financial assessment will clarify which option is more economical for your business.

- **Project Requirements:** Consider the specific skills and expertise needed. For short-term or niche projects, a C2C contractor might be more beneficial than a full-time hire.

- **Flexibility Needs:** C2C offers the adaptability to swiftly respond to changing project demands.

- **Legal And Compliance Considerations:** Ensure compliance with labor laws and regulations, as hiring contractors differ from employing full-time staff.

- **Company Culture And Integration:** Assess how well C2C contractors fit with your team and culture. Effective onboarding and clear communication are crucial for seamless collaboration. Although direct hires might be more deeply embedded, C2C professionals can bring fresh perspectives and innovative solutions.

By weighing these factors and conducting a thorough analysis, you can determine if C2C arrangements are right for your needs and circumstances.

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Embrace The Future Of Talent Acquisition With C2C

As the gig economy grows, the C2C model is becoming a common practice for companies seeking specialized skills, cost-efficiency and agility. Although the benefits are substantial, it's important to navigate the legal landscape, establish solid contracts and build strong working relationships to fully leverage this model.

Adopting C2C arrangements can transform your talent acquisition and project execution, driving your business toward success with agility and precision.

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INNOVATION

From Chatbots To Business Allies: Enterprise Knowledge Assistants

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

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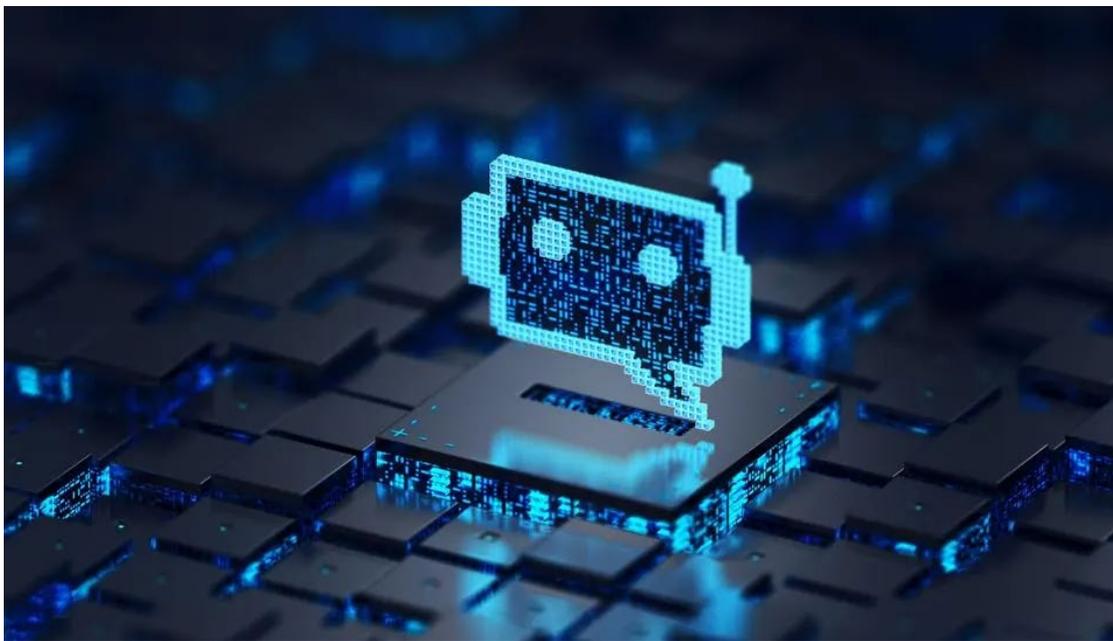
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The evolution of artificial intelligence (AI) in business is continuous. What started as simple chatbots providing basic customer service has now grown into enterprise knowledge assistants (EKAs) that act as strategic allies. These modern AI-powered tools are designed to change how we search for information, provide customer support, manage tasks and do business.

As we look to the future, it becomes clear that EKAs are becoming the trend in the corporate world.

The Journey From Chatbots To Knowledge Assistants

MIT professor Joseph Weizenbaum developed the first chatbot in the 1960s. It was called ELIZA. The program was designed to mimic human conversation. ELIZA reviewed the words that users entered on a computer and then matched them to a list of possible scripted responses. Experts declared that chatbots would be indistinguishable from humans within a few years. However, Weizenbaum rejected the notion that machines could replace human intellect.

Over time, IKEA's Anna Ask characterized the first wave of AI for businesses. It was huge in the 2000s. Anna answers questions about IKEA products, prices, sizes, delivery, spare parts, opening hours, etc., and opens related pages in a browser window. Furthermore, she knows when your local IKEA restaurant is open and what they serve for lunch! Anna also answers simple but personal questions like, "What's your name?" On top of that, she shows emotions, for example, if she can't find the information you are looking for.

However, only in the second half of the 20th century did the world see other versions of AI chatbots, such as Alexa, Siri, Google Now and, finally, ChatGPT.

Unlike their predecessors, EKAs leverage advanced AI technologies, including machine learning (ML) and natural language processing (NLP). ML and NLP are supplemental for EKAs, which is the main point of creating custom LLMs to provide qualified support across various business functions. They do more than answer questions—they understand context, learn from interactions and adapt to the enterprise's specific needs.

Practical Use Cases: How Enterprise Knowledge Assistants Transform Business Operations

The true power of EKAs lies in their customization and scalability. With transparent implementation processes and the option to deploy on-site or via a private cloud, businesses can maintain control over their data and integration processes.

Enterprises can customize the LLMs that power these assistants with their proprietary data, ensuring a personalized AI experience. This adaptability is crucial for maintaining relevance and effectiveness, particularly as business needs evolve.

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The practical applications of EKAs are extensive and varied, showcasing their potential to deliver significant benefits:

- **Customer Support:** Provide real-time, intelligent responses to customer inquiries, enhancing satisfaction and reducing human workload.

- **Market Insights:** Process extensive data to offer insights on trends and competitive standings, aiding in strategic planning.

- **Content Generation:** Streamline the creation of tailored content for marketing and communications.

- **Legal And Compliance:** Manage legal documents, ensuring regulatory compliance and minimizing risks.

- **Predictive Analysis:** Offer forecasts and trend analyses, aiding in strategic planning and resource allocation.

- **Learning And Development:** Deliver personalized training programs, enhancing employee skills and career progression.

- **Product Innovation:** Assist in designing and simulating new products, speeding up the innovation cycle.

The Growing Trend Of AI Adoption

According to various sources, the AI market is expected to grow significantly in the coming decade. For example, based on Statista data, the AI market size is expected to show an annual growth rate (CAGR 2024-2030) of 28.46%, resulting in a market volume of US$826.70bn by 2030.

A survey by Forbes Advisor revealed the various ways businesses are utilizing AI tools:

- Fifty-six percent are using AI to improve customer service.

- Fifty-one percent are turning to AI to help with cybersecurity and fraud management.

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- Forty-seven percent harness AI tools in the form of digital personal assistants.

- Forty-six percent are using AI for customer relationship management.

- Forty percent are turning to AI for inventory management.

- Thirty-five percent are leveraging AI for content production.

- Thirty-three percent are using AI for product recommendations.

- Thirty percent are turning to AI for accounting assistance and supply chain operations.

- Twenty-six percent harness AI for recruitment and talent sourcing.

- Twenty-four percent are using AI for audience segmentation.

Believe it or not, we need to move faster in this crazy market.

Challenges And Considerations

Of course, big enterprises are improving AI daily, but there are still a lot of debates about its adoption. Here are some points to be aware of:

- **Data Security Concerns:** AI assistants handle sensitive data, making robust data security essential. Implement strong protections to prevent data breaches and safeguard data.

- **Integration Challenges:** Integrating AI with legacy systems can be complex and time-consuming, but with careful planning, you can prepare for multiple possible outcomes.

- **Bias And Fairness:** AI systems may inadvertently perpetuate biases in their training data. When training these systems, it's important to keep an eye out for these possible biases.

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How Do We Solve These Challenges?

Custom software development can address some of these challenges by integrating AI systems and ML models tailored to specific enterprises' needs. This approach ensures smoother integration, robust security measures and ongoing support, allowing businesses to focus on the benefits of AI.

The Future

As we've seen, the journey from simple chatbots to complex EKAs has been fast-paced and transformative. These assistants' real magic lies in their ability to adapt and scale to meet the unique needs of any organization.

Looking ahead, the future of EKAs is promising. As businesses navigate the complexities of the digital age, these tools will be instrumental in driving efficiency, fostering innovation and supporting growth. Let's embrace these strategic allies and harness their potential to transform the way we do business.

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INNOVATION

Why Everyone Has A Role In Creating AI Ethics Standards

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Oct 16, 2023, 10:15am EDT

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In an increasingly AI-dominated world, even the realm of governance is not immune. Governments worldwide are actively pursuing regulatory measures to address the deployment of emerging technologies. Their goal is to strike a balance between fostering innovation and safeguarding citizens, addressing concerns related to privacy, security and AI ethics.

As AI steadily integrates into our daily lives, ethical dilemmas have come to the forefront. I firmly believe that this duty extends beyond government boundaries; it's a shared responsibility encompassing each and every one of us, especially business leaders working with or on AI technology.

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Personal Perspective

Allow me to share my personal perspective and opinion. AI is making incredible progress and has the potential to achieve amazing feats. Witnessing AI-driven innovations and lifelike robotic dogs leaving audiences in awe at conferences, it's undeniable that AI's potential is breathtaking.

The world recently received AI tools, which are powerful tools for boosting the work of both each employee and the company. That said, it is important to learn how to use them correctly. In my team, for example, we have developed an "AI tool usage policy" in response to the increasing usage of AI. This policy addresses questions regarding acceptable and prohibited AI-related practices.

Additionally, I would recommend companies conduct surveys to assess AI adoption in your company. When my company conducted a survey, we found that approximately half of our team was already using AI, and 90% of those who were not using it expressed a strong interest in learning more and integrating AI into their work processes.

I aspire to continue in this direction, increasing work productivity and enhancing its quality with AI. However, there is a troubling feeling: What if this technology ends up in the wrong hands? It's a disconcerting prospect, emphasizing a critical concern: AI's progress demands an in-depth examination of ethical applications.AI has transformed lives, affecting governance, industries, decisions and daily routines. Yet, it's imperative to remember that the responsibility for steering the course of AI is not vested in governments alone.

Each of us has a stake in defining the ethical boundaries governing AI's development and utilization. Recent strides, like the European Parliament's AI laws, are notable, but shaping AI's path isn't solely the job of officials. Are we ready for this journey? The answer lies in our actions.

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Principles To Navigate AI

AI applications in various industries bring some serious ethical challenges, including potential job displacement, concerns about the impact on humanity, issues related to security and transparency and debates surrounding singularity and the rights of AI entities.

Every industry faces these dilemmas as they integrate AI technology, and each leader will find unique solutions. However, there are common guiding principles I adhere to in addressing the challenges with AI ethics.

- Provide information, knowledge, ethics and news about AI. Gaining a deep understanding of AI's ethical implications is vital. Whether a person is in a corporate position or leading an ordinary life, understanding the intricacies of artificial intelligence is necessary. Knowledge empowers people to hold decision makers accountable and advocate for ethical AI practices.

- Support human values and rights. The governance of AI depends on maintaining rights and privacy. Regardless of status, respecting ethical boundaries is critical. This is especially true for those who create artificial intelligence technologies since their actions have critical implications that affect the entire society. They must pay attention to whether AI technologies are relevant to human well-being.

- Encourage and support open communication, dialogue and questions. Transparent dialogue is necessary and helps build trust and understanding. From government to corporations to individuals, the exchange of ideas promotes understanding. Leaders must lead by example when interacting with experts, politicians and the public. AI companies must also engage citizens in this dialogue, as they also have a responsibility to participate.

Shared Responsibility For AI Ethics

While AI's potential offers prospects, it also raises concerns about potential misuse. This underscores the importance of ethics. Governments may enact regulations, but the true impact depends on individuals, especially the companies creating or working with AI technology.

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Therefore, let me emphasize my point by acknowledging the rapid growth of AI worldwide. I firmly assert that AI is no longer a matter of choice; it's an undeniable reality. It's up to all of us, whether in government, business or as individuals, to decide how we implement AI ethically.

In simple terms, we collectively shape the future of AI, and it rests within our acceptance. We are laying the groundwork for AI, and yes, we are navigating through uncharted territory. Let's ensure that AI works to benefit humanity's best interests.

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INNOVATION

Privacy And Security: Empowering Trust Through Education And Regulation

Boris Kontsevoi Forbes Councils Member

Forbes Technology Council COUNCIL POST →

Aug 8, 2023, 06:00am EDT

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Within the current digital era, generative AI stands as an eccentric, innovative, creative and unpredictable frontier, advertising a mix of excitement and potential development. Privacy and security are delicate components hanging in the balance as businesses navigate this bold new world. Similar to stepping outside a secure room, engaging with the digital realm comes with its share of risks and rewards.

The Crucial Basics Of Privacy And Security

Privacy and security are basic aspects of our digital lives that require consideration and action. Fostering a sense of security and safeguarding users' well-being is paramount, as it serves as the foundation for building trust.

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Trust forms the basis of any relationship, and our interactions with technology are no exception. Without trust, users may hesitate to embrace technology, hindering potential progress and advancement. Trust is not something that can be purchased; rather, it must be nurtured.

Organizations can do various things to avoid these issues. A few vital activities include:

- **Teaching Clients:** Make clients mindful of security, and demonstrate how to stay clear of potential threats.

- **Using Solid Security Strategies:** By utilizing encryption and multifactor authentication, along with secure network protocols, unauthorized access can be prevented, ensuring information remains secure.

- **Having Protection Policies:** Clearly telling clients how their information is collected, utilized and protected is vital for building trust.

Updating Programs And Frameworks Regularly: Overhauling programs, applications and frameworks helps address vulnerabilities and enhances security measures.

These activities help organizations manage risks and benefits, build trust and safeguard users' privacy and security.

Reliable Information Protection

Despite the danger of data breaches, there are companies that take action to ensure their customers' privacy protection and security.

The banking industry, for example, demonstrates how renowned institutions have utilized solid strategies to secure client information, fostering trust in privacy-related exchanges and personal data.

In the healthcare sector, critical medical frameworks have centered on security protocols, ensuring patient records remain confidential and fostering trust between healthcare providers and individuals who require therapeutic care.

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In the same way, well-known insurance companies have embraced advanced security strategies, keeping policyholders' private data secure and instilling confidence in their ability to manage information securely.

Data breaches can affect any sector but particularly those that deal with vast amounts of sensitive information, such as healthcare, insurance, finance and more. These sectors strive to provide high-quality services and do everything they can to secure their data.

These stories serve as examples for other organizations seeking to enhance their privacy and security strategies. Moreover, they demonstrate how education and regulation can work together to create a culture of trust.

Control And Education

Information leaks from various resources and governmental bodies have led to reactions from entities like the European Parliament calling for regulations on data usage in AI. However, it is essential to scrutinize the efficacy of such regulations. While tighter restrictions may reduce risks, they can also stifle innovation and limit opportunities for growth.

Rules help reduce risks, but they are not enough. Instruction and education play a pivotal role in empowering individuals and businesses to effectively deal with the challenges of the computerized world. By instructing individuals about protection, security and digital etiquette, it becomes possible for them to establish their own rules and frameworks.

Instruction helps individuals act responsibly, make informed decisions and value both online and offline security and respect.

Building Trust

To foster a culture of trust and security, it is essential for businesses, people and policymakers to collaborate and create comprehensive instructional programs that strongly emphasize digital privacy, security best practices and moral conduct. By engaging in such activities, a sense of obligation and responsibility can be instilled, ensuring that all stakeholders understand the importance of safeguarding personal

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and business information.

Rules help protect privacy and security, but education helps strengthen them. By equipping individuals with the necessary information to make informed decisions, it becomes possible to establish a harmonious balance between innovation and preserving security within the digital realm. This approach nurtures a culture of trust and security, which is fundamental in today's ever-evolving digital landscape.

Ultimately, it is the collaboration between instruction and regulation that makes a safer online environment for everyone.

Conclusion

Fostering trust is imperative for ensuring privacy and security in the digital age. Creating a culture of trust with innovation is essential as it enables people to embrace modern innovations without worrying about compromising their privacy.

INNOVATION

Artificial Intelligence: How To Turn Conversational AI Into A Success Business

Boris Kontsevoi Forbes Councils Member

Forbes Technology Council COUNCIL POST →

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AI used to be the stuff of sci-fi movies, but now it's all around us—computer vision and chatbots have become part of the standard business processes. Recently, artificial intelligence has reached its peak and made a breakthrough that has affected almost every industry, from high tech, telecoms, finance and healthcare to pharmaceuticals. The global AI market is expected to grow by more than $500 billion between now and 2030, according to various studies. IDC, a market research firm, predicted that the AI market will be worth over $500 billion by 2024. Let's figure out why.

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The Story Behind AI: When It Was Started

The history of modern AI began in 1956 at a computer workshop at Dartmouth College (New Hampshire, USA), where the term "artificial intelligence" was coined by John McCarthy.

In the late 1950s and early 1960s, AI research primarily focused on developing systems that could mimic human minds: symbolic AI and connectionism (initial neural networks). It appeared to be more complicated, and government financing was cut off in 1974. Then during the 1980s, the focus shifted to the creation of problem-solving expert systems.

Yet, following Lisp machine's collapse in 1987, the second AI winter began. In the 1990s and 2000s, the research revived artificial neural networks. Today, faster computers, new algorithms and the availability of large amounts of data have enabled systems that can interpret complex data, learn autonomously and make near real-time decisions.

But Where Do Concerns About The Reliability Of AI Come From?

Conversational AI and virtual assistants are designed to simplify our daily lives by taking care of tasks that we may find tedious, time-consuming or complicated. They are serving us 24/7—without productivity losses—by understanding and responding to our requests using NLP and machine learning algorithms. Where there are huge advantages, there are also risks, as the whole AI system is vulnerable to any weaknesses or biases in the underlying system that underpins it.

Generative technologies have the potential to facilitate the production of disinformation for big fans of conspiracy theories or propaganda messages. They can also serve as a source of information search for people who do not have a highly developed criticality of the information. Finally, nothing is perfect. Remember how you used to Google information for research? Did you trust all the sources you found? Probably not, but artificial intelligence is highly trusted. Is there a good reason for this?

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You Reap What You Sow

We are familiar that AI is capable of processing large volumes of data in a short period of time and formulating predictions based on patterns identified in the data. However, their ability to comprehend the larger context or comprehend the nuances of a given situation may result in misinterpretation. AI systems only work as well as the data they're trained on. If that data is skewed or incomplete, then the AI's output will be biased and incomplete, too. Moreover, from a limited perspective, in certain circumstances, AI may be given excessive autonomy and control without adequate human supervision. This can result in unforeseen or detrimental consequences that were not anticipated.

Despite the material written above, artificial intelligence is still strongly trusted. According to a McKinsey survey, "more than two-thirds of consumers say that they trust products or services that rely mostly on AI as much as, or more than, those that rely mostly on people."

Unlocking The Full Potential Of Conversational AI For Your Business

Whether you run a business, you are a consumer or both, you want to get the most out of your interactions with machines and humans. No matter what industry you work in, conversational AI can be integrated into various platforms, such as messaging apps and voice assistants, making it accessible to users. It allows companies to automate customer service, personalize communications and collect valuable data. Conversational AI is used by a wide range of businesses, organizations and individuals across various industries, including customer services, healthcare, e-commerce, education and financial sectors.

AI As A Successful Business Model

There are several key steps to developing a successful conversational AI business model. The first step is to define a niche, then create a high-quality product that can communicate naturally, understand complex queries and provide accurate answers. In addition, the AI machine must have the ability to support a large number of users and be trained with machine learning algorithms.

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Secondly, NLP tools may be needed to enable conversational AI to understand natural language queries and provide accurate responses. Integration with existing systems such as customer relationship management (CRM), enterprise resource planning (ERP) and help desk software can greatly enhance the capabilities of a conversational AI product. This can help streamline customer support, streamline workflows and provide a more personalized customer experience.

Finally, the last step is to create a go-to-market strategy. This strategy should include defining the target audience, analyzing the needs and preferences of the target audience and developing a marketing plan to target them. This strategy may include creating a website, advertising and content marketing or attending trade shows. Conversational AI systems should be regularly monitored and optimized to ensure that they meet users' needs and solves their problems. Analytics tools can be used to collect statistics about customer interactions and improve system performance.

A customer guarantee should provide outstanding customer support that will build a loyal customer base in the future and create positive feedback that will enhance your brand image and attract new customers. It is possible to turn your conversational AI product into a profitable business. However, it's important to remember that the AI landscape is constantly changing, so it's important to stay on top of current trends and technologies to stay competitive.

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INNOVATION

Exploring The Possibilities Of Conversational AI: What Do We Want?

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Feb 28, 2023, 09:00am EDT

Boris Kontsevoi is a technology executive, President and CEO of Intetics Inc., a global software engineering and data processing company.

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Whether it's Alexa, Bixby, Siri, Google or Cortana, you are probably using conversational AI from your phone to your car. Conversational AI is a special branch of artificial intelligence that simply enables computers to understand human speech and reply by voice.

One of the most critical impacts of this is that the global GDP is expected to grow by $15.7 trillion by 2030 thanks to AI. This revolutionary technology combines three components: machine learning, automatic speech recognition and natural language processing (NLP). These days, conversational AI looks like a fulfilled dream: you simply ask a question and get a talking answer. Isn't that what we all want from computers?

The Significance Of Improving Information Retrieval

We search for information all the time. This could be internal information produced by you and your colleagues or it could be external, produced by the whole of humanity. Right now, we use computer search, which simply is an index of available information. It's going to be AI-classified and prepare the most suitable answer. Modern search engines will become supplemental. A new way of getting necessary information is going to be a huge time saver and productivity booster. The release of ChatGPT by OpenAI is just the beginning.

The first thing we need to understand is that conversational AI is not just voice assistants—it's a whole new paradigm that changes our relationship with computers forever. As the progress of AI continues to drive the growth of conversational interfaces, businesses are increasingly turning to "talking computers" for new ways to interact with customers and employees. According to Google Trends, there has been a five-fold increase in chatbot interest during the last five years. However, the AI-human relationship has not yet reached its fullest potential.

Nowadays, conversational AI shows up in three main types of products: chatbots, intelligent virtual assistants and customer service assistants. Recent NLP and conversational AI advancements include various innovative options like transfer learning (which allows models to be fine-tuned on specific tasks using smaller amounts of data), multi-modal models (text and images used in computer vision and robotics) and dialog systems (Apple's Siri, Amazon's Alexa, etc.). Also, there are APIs that provide NLP capabilities such as sentiment analysis, entity recognition entity, language detection and processing functionalities, key phrase extraction, concept tagging, part-of-speech tagging, etc.

How Conversational AI Is Being Used

Online Relationship Management

Brands can manage social media engagement and interactions via personalized, synchronized conversations.

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Improved Customer Service And Satisfaction

A lot of questions can be answered in a quick and precise way. This can resolve issues and greatly reduce friction during the buying and post-buying process. In this way, customers can also make a more informed decision, get detailed information about the purchase, efficiently place an order and receive after-sales information.

Improved Security And Customer Information Management

Information can be handled in a more secure way and with much greater precision. This can ultimately lead to significant time and cost savings.

Increased Collective Intelligence

Conversational AI technology can track shopping patterns, monitor customer data and use the results to deliver the best real-time, personal support. Yet, beware of manipulation! (Research and standards are on the way to prevent this.)

What Users Should Demand From Conversational AI

Affordability

While conversational AI is generally affordable, pricing for NLP and conversational AI APIs can vary greatly depending on the provider and the specific service being used. Most providers offer free trials, so you can try out different services before committing to a paid plan. Average pricing is starting from less than $1 per 1,000 characters of text processed.

For example, a company might charge $0.45 per 1,000 characters of text processing with a minimum charge of $25. These rates are based on the number of API calls made during a given time period. As usual, the price of infrastructure is not going to be critical, but you most probably will need professional help to put your AI system together. In our practice, the development of custom virtual assistants ranges from $50,000 to $5,000,000.

Industry Optimization

AI, NLP and other conversational technologies are used in all industries from

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healthcare to finance. Operations like onboarding, employee training and maintenance of employee information can all be optimized by conversational AI. Leave requests, performance reviews and compliance tasks can also be automated.

One of the most difficult aspects of natural language understanding (NLU) and personalization in conversational AI is that, for the time being, it does not take into account the individual requirements and preferences of users. By improving NLU, conversational AI systems would be able to gain a better understanding of the context, purpose and tone of a user's message. This would enable them to provide more accurate and efficient responses to user queries and reduce the rate of error when generating responses.

Personal Optimization

This technology is already being used to help us optimize our jobs and get things done faster, but it's important for AI to improve our personal lives as well.

We already see this today through means such as appointment booking and claim processing. You can use conversational AI to check symptoms and get key information on your prescription drugs. AI even improves self-service kiosks by providing immediate and personalized assistance rather than an experience that aims to push a sale.

To effectively improve AI's conversational capabilities and make AI systems even more responsive to user needs, the key element to remember is continuing to invest in research and development can help improve this technology.

Conversational AI: On Track To Being The Next Big Thing

It's no longer a matter of 'if' conversational AI will be the next big thing, but 'when' and 'how.'

The AI revolution offers tools and methods with the greatest potential for the next radical transformation. It is now possible for us to talk directly with machines even about complex topics like quantum physics or gender equality. These interactions, if exploited carefully, should serve in a good way and soon we will see interesting shifts take place within our society.

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INNOVATION

The Ukrainian IT Industry Is Alive And Healthy

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Oct 12, 2022, 09:00am EDT

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The Ukrainian international IT services industry emerged from the Soviet Union's admired mathematical education and Ukrainian scientific school of early computer science in the '90s and, in the last two decades, has become a nearly $7 billion export industry with about 285,000 specialists.

Yet on February 24, 2022, Russia started a full-scale war against Ukraine. Even with the experience of a similar invasion in 2014, many clients and prospects understandably began to worry for their teams, products and future this time around. Let's look at what happened to the Ukrainian IT industry after six months of the war.

According to reports from the Ukrainian Ministry of Digital Transformation (via The New York Times), IT companies have maintained 95% of contracts and continued to increase exports. Despite the crisis, the technology sector is not only showing resilience but demonstrating growth, indicated by a record $2 billion in export services revenue in the first quarter of 2022.

Currently, the IT industry is already exceeding the pre-war levels. Companies in Ukraine continue to create products and provide expertise in software development, UI/UX design, cloud services, AI/ML, data analytics, cybersecurity and other IT services. To add to this equation, 3% of all developers fight in the armed forces. Many are in territorial self-defense, and 12% to 15% take part in state cyber defense.

How could this happen despite all of the darkest expectations?

The IT industry is mature, and many companies activated their business continuity plans, allowing people to relocate from the eastern part of the country to safer locations with minimal disruptions. Thanks to modern tools and cloud technologies, we are still capable of providing all of the required data protection.

Companies have made executive decisions quickly due to Covid-19 showing everyone that remote, distributed teams can work—and that they can work efficiently (perhaps the only good consequence of the pandemic). Having an established process and modern software development can support distributed teams, and as mentioned above, Covid-19 helped to convince even the strongest unbelievers.

Finally, the education system inspires hope by continuing to bring new talent to the market. Hard times make people more concentrated, more dedicated and more productive.

What will the future hold?

Is it all reliable? Well, it depends on two major factors. The biggest one that we can already see is the potentially looming economic recession. It already heavily affects IT budgets and demand for IT services. I personally remain optimistic.

The second major factor would be the war. Depending on how long it will last, what the result is and what policy the state will adopt regarding IT workers, two scenarios

of events can be predicted. An optimistic and most probable forecast is that the demand for IT services will remain high, the cash flow will stick to Ukraine, and the IT sphere itself may become the new main driving force of the economy. Ukraine is one of the leading outsourcers in the world, and more than 100 Fortune 500 companies rely on the services of Ukrainian technology companies—including Intetics, which has hundreds of software developers in Ukraine. Even in the worst-case scenario, however, the industry will move people out of Ukraine and use developers in other locations. If the experiences of 2014 and 2022 tell us anything, this should be done without disruptions again.

The last consideration is pretty obvious: It's great to see worldwide help to Ukraine fighting the invasion, yet I believe it's more important to give work to Ukrainians. This is a vital step in helping to forget the worries of current times.

Dear clients and dear prospects, let's continue to do our best.

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INNOVATION

Software Development Migration: How To Change Your Team In The Middle Of A Project

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Sep 19, 2022, 10:15am EDT

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Software development is an integral part of pretty much any modern project out there. Despite this, few companies understand how to set up an efficient team to achieve their goals. Issues with software development are not at all infrequent, including:

• Low cost-efficiency.

• Lack of qualified personnel.

• Communication problems.

• Management issues.

• Budget complications.

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These are just a few reasons that might push you to make drastic changes to your operating approach to software development. Luckily, there are plenty of ways to fix those, ranging from bringing specialists into your in-house team to fix local processes to outsourcing your projects entirely to professional teams that have their routine nailed down. No matter what type of development team you are switching to, migrating from one model to another requires special care.

In-House

Building or filling up gaps in your in-house team requires a lot of time and effort and a very good HR department. You have to understand what kind of needs you have to address within your projects at any given time and what sort of specialists can do it. This involves the knowledge of your tech stack, third-party tools, the relationships within your established team, the willingness to train new employees and so on. An in-house team may allow more control over the development process than outsourcing does (however, this might not always be the case).

Outsourcing

Outsourcing is a good remedy for talent shortages and budget constraints. Start with identifying your existing team's weaknesses, securing intellectual property and maintaining mature software processes. During this survey, keep in mind that the biggest contributing factors to success are efficient communication and thorough documentation.

The easiest and quickest way to solve all of your development problems may be to find a company that is willing to do that for you. You can find a surprising amount of those on the market today, and this niche continues to grow.

Hiring an offshore development team is basically like renting an entire operational department. Everything is already taken care of: the hiring process, the communication flow and the tool set choices. All you have to do is formulate your needs as clearly as possible and watch them work their magic. Development outsourcing has become the choice of many small companies, and even those who can afford to keep their own in-house team.

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People appreciate the flexibility of outsourcing and true engineering help. Offshore development teams are often more affordable than in-house teams. You can find the best developers in the world, no matter where they are located. To save costs without compromising on quality, it is very common to hire Eastern European or Latin American software developers. Their salary is going to be about two times less than that of U.S. developers. Turning to an offshore development team is a viable solution for at least one more reason: faster delivery. Furthermore, it's easier to move resources around, and the hiring process is much faster.

On the other hand, monitoring and project management will fall into your hands. For companies that have absolutely no staff competent enough to be able to take the reins, outstaffing may not be the best solution. So consider simply outsourcing if you can't make use of this feature.

Switching Teams

If you are experiencing issues, like the inability to keep deadlines and dropping work efficiency, this is a clear sign you need to introduce some change. There's no need for a knee-jerk leap from in-house to offshore development if it's something minor. Hold a couple of meetings, talk to your employees and ask for their opinions. Formulate a plan.

If you decide that you do need to enhance your in-house development with the help of an offshore company, try to catch the right moment. You absolutely do not want to hand over a half-baked project to a new team, especially if the root of your issues is the lack of documentation and internal communication.

It works the opposite way for transitions from offshore to in-house. Do not wait until the contract runs out to bring your own team in. Have them work alongside their remote partners and take over certain sections of the project. You want to make sure you have a tight team that understands the workflow before you part ways with your offshore developers.

If your problems are not crippling, you might want to restrain yourself to smaller changes. It's much better to replace your development machine one cog at a time.

Final Words

Distributed development is one of the most common methods of modern software engineering. This model is worth consideration if you want to cut project costs and get access to specialists from across the world when hiring. Services like remote in-sourcing combine the benefits of in-house and offshore development. With it, you rely on vendors who can recruit your team in a few weeks, contribute to core development, maintain your operations and take care of related issues along the way without any negative impact on the efficiency of your in-house team.

Unlike the distributed team model, you won't have to deal with the hassle of recruiting developers and setting up workspaces. The result will be a dedicated remote team that will quickly integrate with your in-house development and will be dedicated to your project exclusively. This model is easier on the budget than most of the alternatives. It is designed to plug relatively big holes in your development. And there is no need to spend your budget on the entire remote team when you can just handpick one or two good specialists to take care of everything.

Note that total transitions are never ideal. You want to always have a certain degree of flexibility to allow yourself enough space to maneuver. A hybrid model that combines in-house development with offshore teams may help you get the best of both worlds if you play your cards right.

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INNOVATION

How Tech Leaders Can Stay Up-To-Date On Technology Trends

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Jun 9, 2022, 06:30am EDT

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Rapid technological developments urge companies of all sizes to rethink their operations and offers. Recent McKinsey findings, for example, show that almost nine out of 10 organizations realize their business models will evolve. Out of all surveyed organizations, only 4% have already made fundamental changes to their business models; 21% plan on embedding digital technologies into their current models; while an astounding 64% want to build entirely new digital businesses.

This means we are going to see a huge shift among industries as they build digital practices from the ground up, rather than improving existing models.

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This digital movement isn't limited to IT-related markets. It's shaping the evolution of all industries. According to the IEEE survey of global technology leaders from the U.S., the U.K., China, India and Brazil, technology will be reshaping industry sectors from manufacturing to travel and transportation to education in 2022.

Innovations directly affect sales, and the Covid-19 pandemic boosted the trend. Business practices are rapidly accelerating; what were considered "best-in-class" speeds in 2018 are now sub-par. What's more, a recent survey conducted by McKinsey shows that top economic performers were more innovative than their peers during the current crisis.

So, if you aren't keeping up with the latest IT trends, you're behind the curve. Tech innovations are important for continuous education and tech development. Yet, keeping track of all of them is incredibly time-consuming. Even IT professionals spend a lot of time gathering information, as there are hundreds of expert sources and even more technologies.

How To Stay On Top Of Modern Technological Innovation

Staying up-to-date on IT innovations lets companies improve their products, transform their business and deliver better customer satisfaction. Knowing the latest technological advancements is a chance to stay on top of the industry and contribute to its development. This, in turn, allows you to speed up innovation adoption and, eventually, deliver an enhanced user experience.

To do so, organizations must stay on top of "what's what" in modern technology. Companies will need to find ways to collaborate with each other in order to share ideas and insights to move the industry forward. For example, my company has created a Vocabulary of Emerging Technologies, which covers IT trends and definitions of all emerging technologies for your analysis and reference. Crucially, anybody can contribute definitions to the dictionary. Working together as a community on projects such as this and others, organizations will be able to find the necessary collaboration strategies to understand the wide range of innovations and niches.

Staying on top of recent technology trends also requires a time commitment from employees and direction from the organization at large. Companies must compile resources and help their teams get the support they need to understand the rapidly

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changing world of technology. Here are few ways to get started with the various resources available:

- Subscribe to reports published by CB Insights, Gartner and the World Economic Forum.

- Monitor the Gartner Hype Cycle for Emerging Technologies.

- Study Global M&A reviews, the Periodic Table of Disruptive Technologies and Innovation or reports by tech communities and IT business accelerators like Tech Nation.

While you can subscribe once and receive regular updates from consulting agencies like McKinsey and Deloitte, you still won't be able to keep a finger on the pulse of IT trends without other resources. For instance, you could Google "startup" or "industry ecosystem map" to find out the latest InsurTech trends. Or, you could surf YouTube by entering the right keywords (the industry/trend and year) to find data. And, of course, there are seminars, courses, training sessions galore and professional organizations that allow participants to independently research trends and work on cutting-edge projects.

Conclusion

Keeping up with modern technologies allows businesses to increase sales, transform business models, launch innovative products and improve customer experience. However, the number of emerging technologies is constantly increasing. It's highly time-consuming to keep track of them since there are numerous sources to study, but they don't provide accurate and full definitions, let alone cover all the latest IT trends.

To overcome the challenge, organizations must find ways to help their teams stay on top of this changing world by contributing to the community, subscribing to trade publications, joining professional communities and attending seminars and technological events.

INNOVATION

How To Align Your Website With Your Clients' Needs In The Era Of Digitalization

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Jan 12, 2022, 08:15am EDT

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Today, the demand for simplicity reigns supreme in web design. When a potential client looks for a solution to a problem, it is vital to ensure optimal website speed as well as a level of UX that provides all the required information in a maximum of three clicks.

There has been a huge shift towards websites with a lot of white space, minimal graphics and simple navigation. Psychologically, it makes sense: During the lockdown, many peoples' lives became smaller and simpler. With surmounting stress, internet

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users craved calm environments. "Mindful web design" — an approach that embraces clean designs, simplicity and manageable chunks of information — became a huge trend.

The simpler your design is, the less content needs to be loaded — so your site not only meets the expectations of today's digital audience but also experiences great SEO and increases lead generation.

So, the obvious question is: How do you introduce mindful design into your website?

A Client-Oriented And Mindful Design Approach: A Slide Site

To introduce a client-oriented approach and mindful design into our website, my company, Intetics, decided to transform it entirely into slides. By doing so, we were able to ensure optimal website navigation while providing comprehensive information to our clients within a maximum of three clicks.

One of the features that was most useful was a CMS constructor widget that we built in-house, which lets us create corporate presentations via reusable webpage templates, and is something I recommend any business leader consider building, too, as they look at their own website.

The slide format has great benefits. Instead of sending PPT or PDF files to clients, this allows you to send a link to a presentation. Essentially, one page equals one slide, so if you need a custom presentation for a particular client, the widget will merge the required pages into a unique online set. Different team members — sales, marketing, administration and more — can easily build custom presentations with the freshest information about the company by combining slides on-demand.

Along with the slide format, we embraced mindful design by using clean lines, bold typography, clear CTAs, keyboard navigation and a neutral-colored background. We also embraced easy interactivity with chatbots and easy-to-find search fields. These efforts led to a sleek, fast-loading site that presents well-organized, easily-digestible information. The website has been appreciated both by the professional IT community and the business audience, as it received three awards from WebAwards 2021.

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This design was not just about meeting trends. It was created based on a deep analysis of our target audience and the functions most convenient for them.

Key Features To Implement To Meet Potential Clients' Needs

With the right user interface for your website, you can hopefully provide the "right" user experience for customers and make connecting with your company more convenient. Here are some of the key features to consider implementing for your corporate website.

1. All information is presented in bite-size "slides." By presenting your website's information in easy-to-swallow chunks, you can avoid overwhelming visitors.

2. A visitor should be able to get from the home page to the information they need in three clicks, tops. Again, this is a really important strategy to eliminate frustration on the potential clients' end.

3. Visitors can read the entire site in a linear, sequential manner. They just have to press the "Next" button to move to the next slide.

4. Users can navigate the site with their keyboard instead of just the mouse.

5. There are no scrollers.

6. The site has plenty of multimedia elements.

7. Traditional hypertext could be reintroduced: You can hyperlink all terms used to relevant information.

8. "Breadcrumbs" show potential clients where they are in the navigation.

9. A chatbot can always help answer clients' questions and send them directly to the information they need.

10. Use a long, detailed menu to help readers understand what's available and to find what they need. It also advertises items that potential clients might not have noticed or searched for otherwise.

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11. Relevant gated content is readily available, improving straight lead generation and conversion.

12. The website and corporate presentation offer the same information, providing many benefits for corporate marketing.

Final Thoughts

While mindful design and other site elements were made popular during the pandemic, they're more than just trends. Clean, simple design makes it easier for the user to get the information they need — and at the end of the day, customer care is what really matters.

So, we challenge you to take a look at your website and ask yourself: Does it provide your potential clients with a stress-free experience, or does it give information overload? If it's the latter, it's time to make some changes.

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INNOVATION

Seven Ways To Choose The Best Contractor For UAV Surveillance And Data Analysis

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

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Many people want to find out how unmanned aerial vehicle (UAV), or drone, surveillance can benefit their business, but they don't know where to start. This new technology can cut costs and improve efficiency, but this only works in conjunction with competent contractors. This checklist will help you select specialists whose work you certainly won't have to repeat.

1. Ask Your Analyst About The Benefits

Perhaps you've only recently become interested in UAV aerial filming and don't yet know its capabilities. For example, let's say you service industrial factories or grow corn. Initially, it may seem that in the first scenario, drones would only help identify severe damage to support structures and transformers, and in the second, drones could only help you identify dry areas in a field. But the technology's potential is far broader.

Having examined building structures, you will be able to detect even minimal defects and track their dynamics. And based on aerial field surveillance, you can draw up a map displaying the density and uniformity of seedlings, their growth rate, the color of shoots, the presence of pests and more.

Drones can offer more than you initially expect. Don't hesitate to ask an expert about the data that can be obtained based on your specific requirements. Be sure to describe any tasks and issues you might have in detail to make sure your requirements are fully understood.

2. Determine How Good The Company Is At Data Analytics

If you don't have a personal drone fleet, you will most likely have to work with two contractors: one will do the filming, and the other will process the results. The main challenge is that drone operators do not always understand how and what to shoot.

Perhaps these teams focus on entertainment services; they might have professional drones with a number of cameras and sensors, but they don't use them. Wedding videos don't need LiDAR and infrared sensors. You, however, definitely need this technology.

A professional analyst knows what data is needed and what will inform the operator accordingly: at which altitude to fly, at which angle to shoot, which cameras and sensors to use, etc.

Of course, many providers handle both the shooting stage and the processing of the received data. Pay attention to the company's experience in working with data because

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shooting a field, a construction site or an oil pipeline is easier than extracting valuable information for business processes from this data.

Consulting with a data analyst will help you decide whether you need your own data processing department or if you can outsource processing.

3. For Complex Projects, Choose A Contractor With Experience In Complementary Areas

If your project involves non-standard flight routes, works in conditions with limited visibility and receives information from sensors, it will require more than just UAV shooting. As a rule, AI and IoT technologies are used to fulfill such tasks.

So, with the help of artificial intelligence, it is possible to build "smart" drone routes outside the operator's line of sight, recognize objects and create predictive models for the development of a targeted metric. IoT sensors allow you to refine the information collected by drones and, importantly, receive consistent data from the surveyed objects, regardless of the flight frequency.

In addition to using the technologies mentioned above, an ideal contractor should have experience integrating survey results into corporate systems and working with satellite data. Expertise in working with specific spatial geo-tools and methodologies is another realm.

4. Order The Development Of A Flight Plan

You can find flight program templates on the internet, but they are only suitable for the simplest of tasks, such as measuring flat areas. The next level involves creating a flight mission using a ready-made software package, but here you are limited by the software's capabilities. For complex atypical tasks, it's worth writing your own programs, which should include flight plans.

By improving the software for your tasks, you can maximize the capabilities of drones while also saving money on unnecessary functions. In most cases, the software should manage the work. A human can miss sections or make mistakes in the settings. For example, battery capacity is generally not sufficient for an entire route, so a drone has to return to the base for it to be replaced. The flight route must be programmed so that

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the battery life is sufficient for the return trip. A human being can make mistakes with this — preprogrammed technology cannot.

5. Find Out If The Contractor Can Track Change Dynamics And Give A Development Forecast

To track the processes over time, you need to carry out surveys regularly and compare results. A competent contractor knows how often they need to shoot the objects and analyze data received at different times. Then, they'll be able to provide an estimate based on the existing dynamics and tolerance standards.

The information above is essential: It's much cheaper to detect and prevent problems in advance than it is to eliminate their consequences. This is especially important for projects that require uninterrupted supplies and no downtime.

6. Request The Results In A Convenient Format

Imagine you have thousands of files, tables and databases. You'll have to scour through all of this for the necessary images, compare them and then create charts and maps. There is no point in investing in UAV filming and then doing the rest of the work manually. When there's a lot of data, it's convenient to manage it through a web portal or software, where everything is organized and visualized in an orderly fashion.

7. Embed UAV Survey Results Into Business Processes

UAV surveillance results need to be integrated into business processes so that the information collected is valid and useful. Most likely, you won't be able to do all this integration yourself, even if you have your own IT department. This will require an entire infrastructure of powerful servers, software, specialists in databases, machine learning and more.

With these points in mind, you should be well on your way to vetting the right UAV surveillance and data analytics contractor or contractors for your organization.

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INNOVATION

The Benefits Of Service Level Agreements In Custom Software Development

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Jun 22, 2021, 109:03am EDT

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Measuring the productivity of software engineers is a controversial topic. A traditional service level agreement (SLA) encompasses the scope of agreement-related issues, but productivity remains one of the most disputable, interesting, and actual points. It's a question that's been tackled by research studies and software engineering experts, and while there's no common consensus, there's agreement within the industry that it needs to be done.

When a software project is commissioned, a service level agreement (SLA) is put into place. The SLA is part of the contract between developer and client and measures

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overall project performance, usually with industry-approved metrics. It's incredibly important to have an SLA as part of your contract(s) with a software development partner for five main reasons: (1) Establishing measurable levels for all IT services; (2) Setting performance and responsibilities expectations; (3) Documenting communication, governance, and reporting processes; (4) Underlining focus on customer service; and (5) Outlining dispute resolution procedures, awards and penalties.

The SLA usually includes support, regular maintenance, hosting/infrastructure, backups/testing, and in some cases, software processes. But what it never includes is custom software development. The reason why is quite simple: there aren't standard or universal metrics for predictable software development output.

It's time to change that. We need to create the metrics—or more specifically, the process—for which to measure software engineer productivity.

Given the prevalence in software engineering in this day and age, it's no surprise that the lack of measurement is an ongoing issue and topic in the industry. Many businesses have struggled to find a way to measure and track true productivity. No one has completely cracked the code but I do believe we're getting close.

At the most basic level, there are some inherent problems with measuring software engineer productivity. In the early days of coding, managers would measure individual productivity by tracking/counting Lines of Code (LOC). Keeping track of a programmer's output as measured by LOC didn't work because it's short-sighted—it doesn't take into consideration quality or reuse of code. It didn't take long before it stopped being a major metric.

Thankfully so! In modern times we need more sophisticated ways to assess productivity. And more importantly, we need to change the lens through which we measure. I believe all productivity metrics should focus on business outcomes.

A software project is considered successful when the product is delivered and signed off by the client. The "client" can be external or internal, but their satisfaction with the product determines success. An important point to remember as you dive into metrics for your team.

One of the biggest problems with using LOC as a way of measuring productivity is that it's one singular metric. And that's just not how it works. I love the analogy I've heard likening software development to sports. No one stat makes someone an amazing baseball player or footballer, it's the aggregation of stats that paints the full picture.

The same is true in software development. There is no one KPI that can be used to measure development accurately or comprehensively. It's more important to identify and measure a collection of metrics. And the aggregation of metrics should adjust, depending on the specific project and client. Every project's metrics will be different because every project and every client is different!

If the project has tons of features, it makes sense to track how many features each developer ships. Yet, the functional points approach proved to be too complicated. Other metrics, like velocity and bug tracking, are likely to be used frequently, while others might not be used at all. But perhaps the most important metric to capture is quality. It is the most difficult to quantify but it seems we solved this problem already. It's also important standards are created and enforced prior to adding quality metrics to an SLA.

I think we're quite close to adding custom software development to SLAs. There won't be one consistent way of doing it, but that shouldn't be too surprising in the limitless world of software development. After defining your client's determined business outcome, work with the collective team to determine the most appropriate KPIs and metrics to use. Ask the engineers themselves! As the ones working in the trenches, they'll have the best idea of what is most important for each individual project.

SLAs in custom software development are coming soon. Be sure you and your teams are prepared for the shift. And though your SLA is a documented agreement, it doesn't need to be lengthy or overly complicated. Just build one and validate with your client, it's flexible and can be adjusted as needed.

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INNOVATION

Why Distributed Software Development Teams Work Infinitely Better

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

May 13, 2021, 09:44am EDT

Boris Kontsevoi is a technology executive, President and CEO of Intetics Inc., a global software engineering and data processing company.

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It's a hot topic in the industry right now: are distributed software development teams as efficient and effective as those that are colocated? While many in the software development field believe teams that work together far outpace and outwork those distributed, I adamantly disagree. I'm a huge advocate for distributed teams, and here's why.

First, let's agree on what exactly "distributed software development" means. To me, it refers to planning, designing, building, testing, implementing, and managing software

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with different co-functioning teams located across various physical workspaces. This is quite different from "working remote," and I think it's important to note the difference.

While many in the software development field believe teams that work together far outpace and outwork those distributed, I adamantly disagree. I'm a huge advocate for distributed teams, and here's why.

First, let's agree on what exactly "distributed software development" means. To me, it refers to planning, designing, building, testing, implementing, and managing software with different co-functioning teams located across various physical workspaces. This is quite different from "working remote," and I think it's important to note the difference.

Remote teams have one central headquarters location that makes all the decisions and defines processes that each worker follows. Distributed teams are less hierarchical in their construction. I love how Dropbox sums it up on their company blog: "Remote work is a discipline for the individual worker, but distributed work is a discipline for the entire organization. From a distributed work perspective, a company is just a collection of resources aligned on a common mission."

Traditionally, software dev teams have shared a workspace to increase collaboration which would lead to getting more work finished and hitting more deadlines. But in recent years—and even more specifically with Covid-19—it's become quite clear how distributed teams are the way to go.

A big reason tech executives are wary of distributed teams is because it goes directly against some of the core principles of agile development, specifically that face-to-face communication is best. But recent advancements in video technology makes this objection practically obsolete. Adherence to the remaining agile principles and the addition of deliberate and intentional communication via video can result in even better development results.

Three of the most important benefits of distributed software dev teams are people, money, and work output. Let's start with people. Gone are the days where you need to find the right person for a role in the same geographic location. Silicon Valley and

Austin, TX no longer have a hold on all the top engineers, and it's time to find the right person for the role no matter where he/she lives.

Hiring people with diverse backgrounds has myriad benefits for your team: reduced salary costs and much more diverse perspectives on problems. In fact, a research company in the U.K. found that diverse teams are 60% better at decision-making, and diverse companies are 35% more likely to have profits above their competitors.

Many (if not most!) top tech organizations are utilizing workers from international tech hubs like India, Ukraine and Brazil. This isn't a new practice, but more and more businesses are starting to use their learnings and going fully distributed.

The second reason is money. There are significant savings with distributed teams. With reduced or no office space, companies save money on rent and office-related expenses like utilities, parking, and other maintenance items. Travel costs also go way down with less focus on face-to-face meetings. And while you can't measure mental health in dollar bills, it's important to remember that not only is work distributed in this model, so is the stress. This means your employees will experience better mental well-being overall which is priceless in 2021.

Lastly, higher quality work is the third big benefit of distributed dev teams. A recent MIT Sloan Management study found, "Dispersed teams can actually outperform groups that are colocated. To succeed, however, virtual collaboration must be managed in specific ways." Be sure to pay attention: these might be the most important two sentences in this article. I'll repeat: dispersed teams outperform colocated teams and collaboration is key.

No distributed software development teams are successful without several things in play. Here are five critical strategies to employ:

1. Create regular and consistent meaningful virtual interactions. Constant and clear communication is a must with distributed teams. Managers and leaders need to schedule regular team meetings as well as 1:1s with individual team members. It's easy to skip a regular 1:1, but in this work environment, they're crucial to success. Make sure all project kickoff calls are face-to-face video.

2. Keep everyone up to speed on agile practices. One of the most effective ways to keep distributed teams on target is to have a dedicated coach. This role is focused on keeping each team member in their lane and working towards the same goal, no matter how many times it may change.

3. Have the team create a social contract. A good distributed development team will create a contract that outlines how members will behave, make decisions, communicate, and essentially, work together. Having this in place will alleviate any information hoarding and petty gossip and eliminate the grapevine.

4. Adopt face-to-face video onboarding and training. Putting faces to names from day one will help build the foundation for a great new addition to the team. A warm team welcome combined with clear onboarding documents and team contact information is the best way to add new players to the team.

5. Use the best tools to collaborate and measure/manage distributed development. Truly successful distributed teams rely on collaboration software. A fully equipped team employs a solid messaging tool, an Agile tracker, and a video communication platform.

With more tech companies seeing the benefits of distributed software development teams along with the repercussions of the pandemic, it's clear where our industry is headed. I predict that the companies that understand and adopt this method early and consistently will top their competition.

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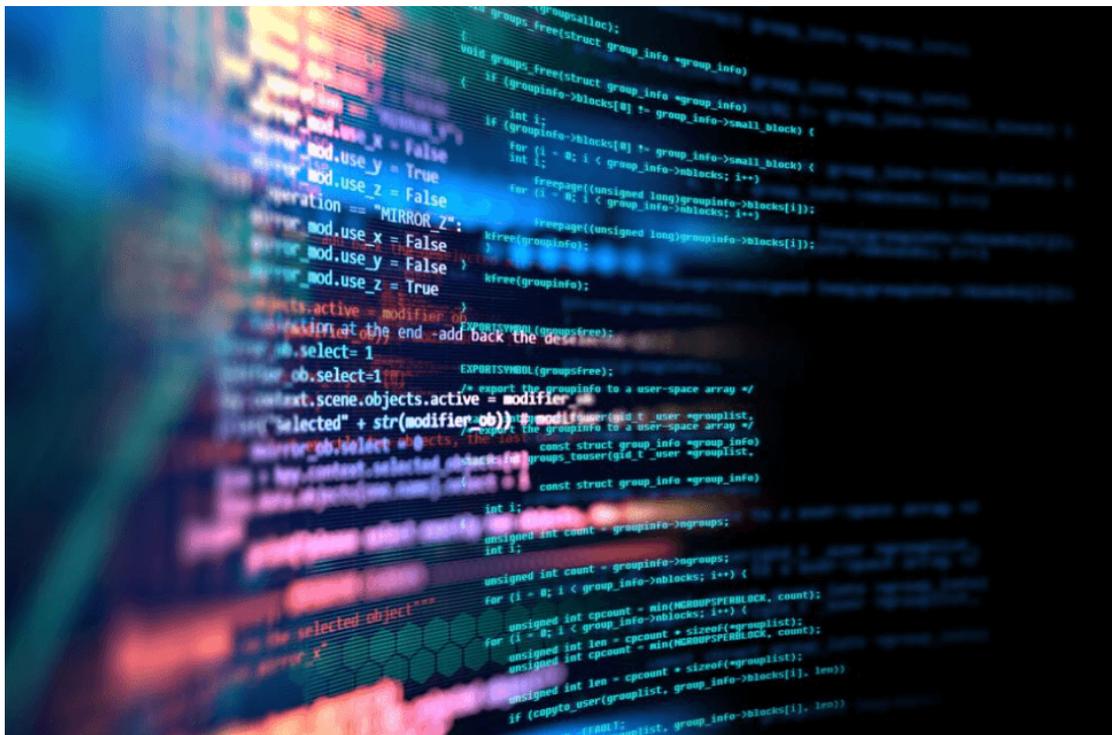# What Exactly Is Artificial Intelligence? (Hint: It's All About The Datasets)

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

May 4, 2021, 10:40am EDT

Boris Kontsevoi is a technology executive, President and CEO of Intetics Inc., a global software engineering and data processing company.

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Many of today's emerging technologies and products heavily rely on artificial intelligence (AI) and machine learning (ML). And while there are hundreds of articles written about this topic, very few get into the nitty gritty of what truly powers AI: data.

The definition of artificial intelligence varies depending who you ask. A data scientist will have a much different answer than someone who is just peripherally aware of AI. Even within the field of data science, there's debate about what exactly AI means. And depending who you ask, AI can be a good or bad thing. Some scientists see it as an

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important tool in the fight against cancer and the exploration of space while others hear the words "artificial intelligence" and conjure up images of robots taking over the world. In my opinion, AI is pivotal technology that can—and has—helped us accomplish many things.

What does AI truly mean? The definition is actually quite simple: the science of training computers to do human tasks. This is the most basic definition and also the oldest, dating back to the 1950s when computer scientists Marvin Minsky and John McCarthy began researching AI.

In modern times, AI's definition has expanded to include more specificity. For instance, Francois Chollet, an AI researcher at Google, thinks AI is specifically tied to a machine's ability to adapt and improvise in a new environment. It also includes the ability to generalize its knowledge and utilize it in unfamiliar scenarios. "Intelligence is the efficiency with which you acquire new skills at tasks you didn't previously prepare for," he suggested in a podcast recorded in 2020. "Intelligence is not skill itself, it's not what you can do, it's how well and how efficiently you can learn new things."

Though AI and machine learning (ML) are oftentimes used interchangeably, in reality ML is a scientific field, a tool that makes AI happen. ML models look for patterns in data and try to draw conclusions, i.e. they train a machine how to learn. This leads me to the most basic part of AI and ML: data. And to be even more specific: datasets. Every single AI application requires a suitable dataset.

Datasets for machine learning are the main commodity in the world right now. Everybody is talking about AI and AI applications but a few are focusing on how accurate the data is and if the data is actually correct. Data collection needs to be deliberate—the success of its intended application depends on it.

As those in data science know, datasets are necessary to build a machine learning project. The dataset is used to train the machine learning model and is an integral part of creating an efficient and accurate system. If your dataset is noise-free (noisy data is meaningless or corrupt) and standard, your system will be more reliable. But the most critical part is identifying datasets that are relevant to your project.

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So your company has decided to make the jump into data science and needs to collect data. But if you don't have any, where do you start? The answer is twofold. One option is to rely on open source datasets. Companies like Google, Amazon, and Twitter have a ton of data they're willing to give away. And many online sites dedicated to AI and AI applications have compiled free categorized lists which make finding a good dataset even easier. Wikipedia has a fairly comprehensive list of available datasets too.

There are some things to keep in mind as you begin searching for the ideal open source dataset for your system:

- Pursue clean datasets. It's easier overall if you don't have to spend time cleaning the data yourself.

- Depending on the scale of your project, search for datasets without a lot of rows and columns. The fewer the rows, the easier it is to work with.

- And perhaps the most important part of your dataset hunt: There needs to be an interesting discovery within the dataset.

The other option is to mine your own data from internally collected records of your company. Knowing the problem you're trying to solve is crucial in the discovery phase and will help decide which data may be more valuable to collect. It's also important to remember that data collection by humans is oftentimes tedious and employees most likely won't be excited about doing manual data entry. Instead, consider using robotic process automation systems. RPA systems are basic bots that can do repetitive and mundane tasks.

I'm guessing you've heard the term 'big data' thrown around. Who hasn't? It's one of this decade's most popular terms. But if your company is just dipping its toe into AI and ML, it's better to stick to smaller and less complex datasets. You can tackle big data once you've mastered a smaller scale ML system.

What we can do—and what we've already done—with AI and AI applications is incredible. But there are still some major limitations and challenges. As research firm McKinsey & Company summarizes: "While much progress has been made, more still needs to be done. A critical step is to fit the AI approach to the problem and the availability of data. Since these systems are "trained" rather than programmed, the

various processes often require huge amounts of labeled data to perform complex tasks accurately. Obtaining large data sets can be difficult. In some domains, they may simply not be available, but even when available, the labeling efforts can require enormous human resources."

AI and ML are two of the most important scientific breakthroughs in recent history. Both will continue to enhance emerging technologies and influence robotics and the Internet of Things (IoT) in the future. We've made enormous strides in the science of AI—and datasets—over the past 10-20 years and we've only just scratched the surface.

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INNOVATION

Outsourcing Is Dead—Long Live Outsourcing

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

May 4, 2021, 10:40am EDT

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The world without outsourcing is hard to imagine today. Modern outsourcing has been a hot trend since the 1980s. The main purpose of outsourcing used to be the reduction of costs, concentration in core competence and achievement of better overall efficiency.

Outsourcing's roots lay in ancient times, as the very starting point was the emergence of the division of labor. After the Neolithic Revolution, the development of agriculture and various crafts led to the rise of cities, where inhabitants could prosper thanks to

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the commercial division of labor and specialized activities. This, in turn, improved the technical level and quality of products and led to future industrial revolutions.

Let's note the main result of this pre-outsourcing—the specialization or achieving excellence in a particular craft. Simultaneously, as usual, people looked for efficiency to beat the competition, and the specialization constantly deepened, primarily to save on training costs.

Greek philosopher Xenophon wrote in the 4th century BC: "There are places even where one man earns a living just by mending shoes, another by cutting them out, another just by sewing the uppers together, while there is another who performs none of these operations but assembles the parts." This indicates another trend of pre-outsourcing—using lightly qualified (aka cheap) labor to achieve efficiency and competitive advantage.

On the other hand, to protect specialization and commercial position, from medieval guilds to corporations of the 19th and early 20th centuries, companies started to encapsulate and control every small specialization necessary for production. This included the supply of raw materials, manufacturing of tools, human resources, legal services and more—effectively becoming vertically integrated organizations. This development of monopolistic capitalism and concentration of power would stop further specialization and efficiency advances, but thanks to industrial revolutions and technology innovations—as well as some help of governments through antitrust legislation—the competitive environment has been preserved.

As companies had to continue competing, India and China started to offer large pools of cheap yet unqualified labor beginning in the 1980s. The era of modern outsourcing had begun. U.S., European and multinational corporations had the possibility to save a buck yet still needed to provide extensive training, expertise in technology and management supervision to the local outsourcing companies or their own captive centers.

The huge difference in the labor costs quite justified such an investment. Starting initially from manufacturing outsourcing, the development of the internet in the late '90s created a door for the outsourcing of white-collar services as well. At this point, a huge wave of outsourcing criticism had begun, as it was associated with mass job

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losses, worker insecurity and melting quality. It's not true, as job losses due to technology and innovation advances have been here for many centuries but have also been painful for many centuries. Who now remembers such professions as a human alarm clock, a lamplighter, a log driver or a switchboard operator, which do not exist anymore? According to a recent McKinsey report, robotic automation will cut as many as 800 million jobs worldwide by 2030, far more than can be attributed to outsourcing.

Following the criticism, just after about 10 to 15 years of the existence of white-collar outsourcing, the word "outsourcing" became almost a public enemy and a new curse. Outsourcing was proclaimed dead by many.

During those first years, however, outsourcing companies and the huge pool of their workers gained best-in-class expertise and various vertical experience. They became not simple, low-cost labor but the most knowledgeable and innovative powerhouses in many technology areas. Specialized expertise offered by providers has steadily replaced cost reduction as one of the most important factors for outsourcing. (Remember the ancient achieving of excellence in a particular craft? The history wheel turned around another time!) Additionally, outsourcing providers developed and adopted new service models like shared services, dedicated development, remote in-sourcing, multisourcing and offshore dedicated teams, and it started to offer new innovative business models that included risk-sharing and output-based—and even outcome-based—compensation.

An additional key benefit today is that world-class talents can be found and engaged in a shorter time, guaranteeing companies a much better chance of success, with providers capable of effectively managing those distributed teams. Plus, AI-based automation takes on a significant workload and becomes an increasingly valuable asset.

The phenomenon of outsourcing appeared as a response to a need for cost reduction. Over time, outsourced labor gained knowledge and skills from the developed companies who outsource. After 30 years of the industry's development, we are facing a situation in which outsourcers have become full-fledged specialists in their areas of expertise. Nowadays, we observe the second wave of outsourcing—its reincarnation. It is still cost-efficient to outsource even though the cost benefit has shrunk compared to

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the first wave. The incremental benefit of the second wave is the knowledge wealth, in which the company that outsources also gains quality expertise from a wide pool of professionals.

At the end of the day, we have gotten better efficiency of professional services for less money. The key benefit of outsourcing is evolving from cost-cutting to process and labor optimization. It will continue to be one of the most important components of business strategy for decades to come. In future articles, we'll investigate how technology advances from the invention of the internet to robotic automation to AI make outsourcing even more valuable.

Long live outsourcing!

INNOVATION

How Tech Leaders Can Help Shape The Future Of K-12 Education With Edtech

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Jan 25, 2021, 10:40am EDT

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The ongoing Covid-19 pandemic has drastically changed not just the appearance of K-12 education, but its very inner workings as well. The global lockdown of educational institutions has caused major disruptions in K-12 learning — such as interruptions of internal assessments, cancellations of public standardized tests and the complete transfer from physical classes to digital learning spaces. According to a study from Education Week, at least 55.1 million American students were affected by school closures related to the pandemic.

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The education industry wasn't prepared for a change of this magnitude, and a plethora of schools didn't have proper software solutions in place to facilitate such an upheaval. Thus, the demand for the development of remote learning software solutions has increased. My company, for instance, has experienced an increased demand for developing custom edtech software solutions, and I expect this trend will continue.

Along with the increased demand came the realization that a hybrid schooling solution could be beneficial for K-12 classes even after the pandemic ends. With virtual services, teachers can have more time to interact with students directly. According to a study by McKinsey & Company, in a "normal" (i.e., fully physical) classroom, educators work 50 hours per week but only spend 49% of that time interacting with their pupils.

The K12 Industry's Path In 2021

The K-12 industry is evolving to become more collaborative, student-centric and data-driven. However, along that journey, there are several roadblocks. Leaders in the technology space, especially those who offer edtech solutions, stand to play an important role in making remote learning easier. Let's take a look at the most common K-12 edtech challenges we'll likely see in 2021, with expert advice on how to solve each one.

Challenge 1: Integration Of New Solutions Into Existing Software Platforms

According to a survey conducted by EdTech Evidence Exchange and the University of Virginia, 86% of teachers believe that the necessity for new technologies in schools will increase over the next three years — not just to offset the impact of Covid-19 but also to improve learning outcomes and reduce socioeconomic and racial disparities.

A key thought that turned up again and again in survey answers was that educators need a way to provide more individualized instruction. However, many school districts are already locked into certain software — thus, any new solution must be compatible and integrated into the systems already put in place. Currently, schools are leaning toward introducing systems with reporting functionalities that allow educators to identify trends in student behavior and assessment results, analyze those trends and create a plan to improve performance. SMS can also include parent and student

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portals, making these systems an effective tool for consolidated data collection and communication.

Challenge 2: Migration Of Users From Obsolete Software Platforms

According to a survey from the EdWeek Research Center, the average school district has experienced minor or significant reductions in budgets. Fiscal experts are predicting that the Covid-19 recession will last much longer than the famous recession of 2008, and this will likely have severe consequences for the nation's public schools.

It is imperative that edtech leaders make budgeting a focal point of their solution. Modern business operations management software can make it easier for districts to manage their money, keep track of cuts and link all the schools in the system. This could be a selling point that contributes to the justification for schools to migrate their existing information to newer platforms.

Challenge 3: Scaling Up Existing Products

The trick to success in the edtech realm is to scale your company so it is a viable tool that helps teachers and students alike. A scalable business can adapt to a bigger workload without declining in performance or losing out on revenue. A key part of the approach to scaling up products is not only designing for teachers and students but also selling to school districts. Earn trust among the districts that implement your product. The higher-ups at districts communicate with each other about solutions that work and that don't meet their expectations. Sometimes, however, the process of getting district referrals can take years. In the meantime, other ways to address the challenge include finding your niche, seeking partnerships in education, looking for angel investors and making use of highly efficient software teams.

Challenge 4: Implementation Of The IT Compliance Program

Developing and implementing an effective IT compliance program — as well as providing ongoing maintenance — can be tricky. When building edtech products, business owners must consider privacy. When your technology is designed for kids, it is essential to ensure consumer trust and mitigate risk by following privacy laws and best practices. Failure to comply with these laws can lead to huge fines, the loss of

reputation and perhaps even a media scandal. Some federal laws to keep in mind include FERPA, PPRA and COPPA. FERPA protects student records, PPRA protects student information that is gathered through surveys, and COPPA limits businesses from collecting data on kids under the age of 13. Failure to comply with these laws can have severe consequences, such as massive fines.

An Effective Solution

In order to meet all the aforementioned challenges head-on, many K-12 school districts are turning to custom software solutions that meet their specific needs. Edtech software developers can ensure that their products will not just survive the ever-evolving education industry but help it thrive.

So, what will are educators looking for when considering custom software development solutions? These are five key questions they'll be asking themselves when evaluating offerings from edtech software providers:

1. Do they integrate software solutions and migrate their customers' bases?

2. Is their infrastructure secure and compliant?

3. Can they develop, refine and support existing software products?

4. Do they set up and execute a QA automation strategy, thus ensuring 24/7 sustainable work?

5. Do they scale up clients' operations by building highly efficient software teams?

Those looking for expert development services for edtech software will be looking for a partner that meets those needs.

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Centers Of Excellence As A Business Enabler In The Era Of Millennials

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Aug 6, 2020, 10:40am EDT

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If you're reading this article, there is a very high chance you are a millennial. And if you're not, the person who sits next to you in the office, on the train or in a stadium likely is.

According to research by Brookings, millennials account for one-third of the world's workforce, and their representation in the labor market is expected to increase to 75% by 2025. The millennial generation is the main driver of innovation and development in technology, too. This age bracket needs to be understood in order for us to know what the future of the workplace will look like and exploit this generation's potential.

Millennials are often considered the most knowledgeable and educated generation in human history. They are hard-wired for innovation, and many are in leadership roles. This new breed has proven to be less risk-averse than older generations. They are more open to ongoing learning opportunities in order to adapt to changing technologies and new realities, and they want feedback two times more often than other generations. This means they are willing to learn and be coached.

Furthermore, they view their managers as a direct source of enhancement of their personal development. However, only 46% of millennials said they feel like they receive appropriate guidance from their managers. As a result, there is considerable necessity for change by the top management of modern businesses in order to facilitate further business growth and development.

Many millennials also prefer crowdsourcing and working in teams rather than independently. Their approach to IT is singular: They not only drive digital transformation in organizations but also prefer meaningful work that has positive social impact. Millennials strive to realize their personal and professional potential. This is the driving factor for the natural transition from I-shaped to T-shaped specialization.

The T- and I-shaped concept was first used by McKinsey & Company as a learning and knowledge acquisition method in its centers of excellence (CoE) model. A person with I-shaped skills possesses excellent knowledge and abilities in a specific area. A person with T-shaped skills is also fairly capable in many other related areas and possesses various extra skills.

This extended skill set makes T-shaped professionals extremely valuable. They are also good at collaborating with others and adapting to varying demands: They are excellent communicators and embrace flexibility through human adaptability. In comparison with I-shaped specialists, fewer T-shaped specialists are needed to do the same amount of work, or the same number of people can get more work done.

As T-shaped specialists, millennials have a competitive advantage that helps them deliver superior value to their organization. As such, forward-looking companies understand the importance of and promote a favorable environment for personal and professional development.

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Cash-rich tech giants like Salesforce and Google, for example, provide their employees with creative platforms and time to work on projects of their choice, helping them develop personal skills, feel more engaged and boost innovation within the company. CoEs have proven to satisfy both necessities in business innovation and advancement and millennials' demands for skills and professional fulfillment.

The CoE is a specialized team that develops and provides leadership, best practices, research, support and training for a focus area. This enables organizations to address their innovation and transformation agenda, gain a competitive advantage and secure continuous success. CoEs benefit everyone from stakeholders to employees to customers.

With substantial resources to invest in their CoE, bigger companies are better equipped to choose the technologies and domains that are of interest to them and their employees. Employees are allowed and even encouraged to spend their work time participating in CoEs. But what can smaller companies do with their tiny research and development budgets?

At Intetics, our company leadership acknowledges the importance of CoEs and the value they add to smaller IT businesses. Our team has enabled employees to establish a dozen CoEs based on their — not the company's — technology preferences and interests. It's no surprise that these CoEs cover some of the world's most innovative technologies, including artificial intelligence/machine learning, the cloud, IoT, geospatial, drones, robotic process automation, big data, etc.

Based on our experience at Intetics, there's a lot you can do for your CoE participants, whether it's providing marketing support, offering specialized books and materials, inviting external experts to hold workshops and training sessions, procuring access to external cloud environments, etc.

In short, you should provide full support for your employees' journeys to specialized knowledge and out-of-the-box thinking, but not regular enumeration or work time allocation. The CoE environment also encourages experimentation and enables people to go that extra mile. You may also want to give additional monetary benefits to employees who help the company score a new business deal as a result of unique knowledge gained through the CoE.

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One question that frequently surfaces regarding such a "voluntary" CoE strategy is about (lack of) business development strategy. Well, if you are a service organization, would it make a big difference if your next big client was interested in an AI or an IoT product? A company with wide technological expertise will benefit in either case, and companies with the versatile knowledge of T-shaped specialists are best placed to do so.

Over the last decade, CoEs have proven to be a catalyst for innovation and business growth and a mechanism to help employees achieve their personal development goals. As we continue to see businesses in the technology world managed by millennials, the need to embrace a workplace medium that encourages self-development is becoming increasingly critical. And one of the best ways to facilitate crew and business growth, even at a small company, is to provide a platform that supports integral features of centers of excellence.

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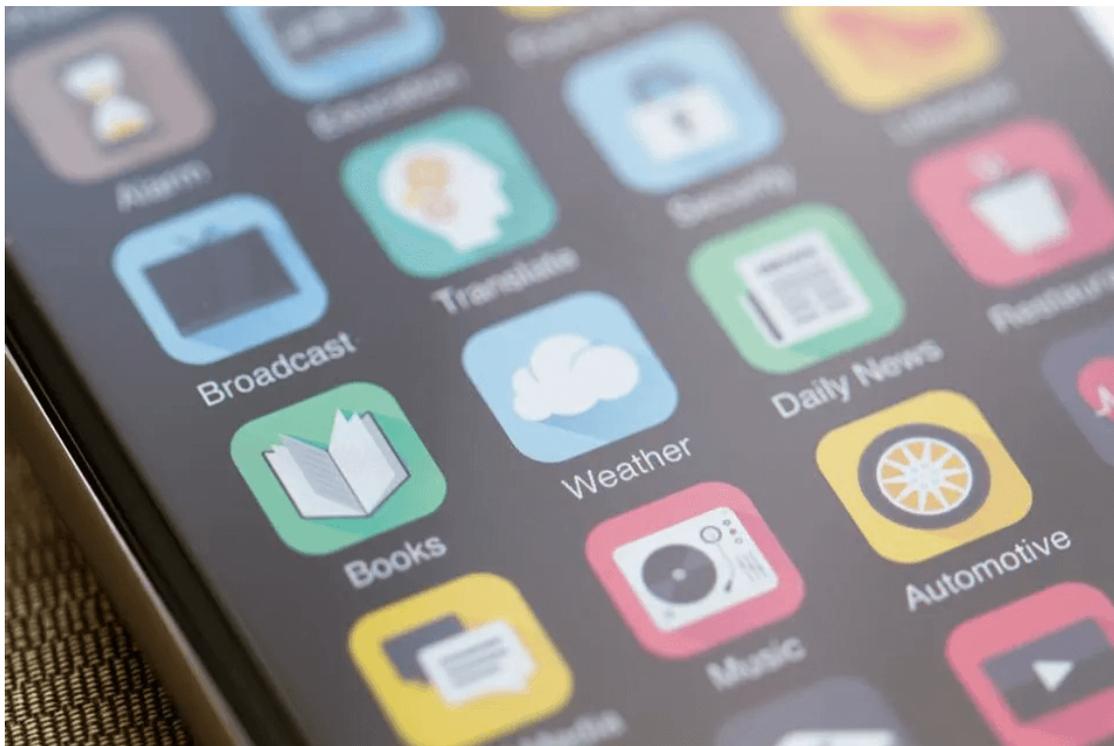# Mobile App Monetization Part 4: Revenue Generation Models

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Jun 30, 2020, 09:00am EDT

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In my previous article, we covered some of the mobile app monetization models. In this article, I will talk about crowdfunding and donations to cover all the revenue generation models that I mentioned in the first article related to mobile app monetization.

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Crowdfunding

During the early days for your app, while you are lacking finance for development and marketing, you can use one of the many available crowdfunding platforms, such as Indiegogo, Kickstarter, AppsFunder or CrowdFunder.

Many successful apps have been crowdfunded. An example of a recent success story took place in 2019, when language-learning app Fluent Forever raised more than $500,000 on Kickstarter from 4,000 platform users.

If you are leaning toward crowdfunding, you should begin with building a brand and planning a promotional campaign. This market can be described as a crowd of apps vying for attention from the bigger crowd, so it is crucial to have a clear vision of how you are going to make your voice heard and have the resources necessary to put this vision into action.

The rewards for potential backers can range from equity to merchandise and in-app perks. Base your choice on the value that your app provides and the demands of your potential funders.

If you have the resources and expertise to run a successful campaign and/or you draw on an established, popular brand, this monetization (or, rather, funding) option might be your best option.

Donations

Relying on donations is like playing the app monetization game at the God difficulty level.

You are unlikely to create a competitive advantage that will be sustainable enough to cover the development, maintenance and marketing costs by donations alone. It is difficult to incentivize users to pay that much on a regular basis while the freeloader mentality governs the general mobile app user base.

This makes the entire revenue generation model based on donations highly unpredictable. Also, measuring effective cost per acquisition (eCPA) will be a difficult task.

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In which case, might this model work for you? The answer is simple: Yes, when what you do matters a great deal to your target audience.

Canadian journalist Jesse Brown has been able to ensure stable monetary support for his website, Canadaland, and podcast through a monthly donation subscription on Patreon (now complemented by merchandise and an ad-free podcast feed). However, you don't need to be a patron to access his content.

Still, Brown is said to have generated between $17,000 and $20,000 through this revenue model monthly in 2018.

But if what you do matters to your user base, why limit your monetization options to donations? Instead, you can try to combine it with occasional ads, sponsorship, merchandise sales, and other revenue generation opportunities — just like Brown does.

Some Closing Thoughts

Knowing which monetization models are available to app publishers today is not enough to develop an intelligent business plan.

Before you opt for one of the revenue generation models, you should learn your target audience well. Understand why, how, when, and who will use your app and how much they might be willing to pay for it.

Entrepreneurial fever is an essential driver for you to get things going, but don't let it tunnel your vision. Investors expect you to operate with concrete figures, and the market is ruthless.

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Mobile App Monetization Part 3: Revenue Generation Models

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Jun 9, 2020, 09:00am EDT

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In my previous articles, we have already considered some of the mobile app monetization models. In this article, I will tackle user subscription, affiliate deals, service fees and m-commerce in order to help startup founders monetize their ideas.

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User Subscription (SaaS)

The subscription model works with mobile apps exactly as with any other SaaS: A user subscribes for an app and is automatically charged over the subscription period until they cancel.

AppAnnie recently reported that subscription revenue from nongame apps resulted in a consumer spending boost for the entire industry up to $120 billion worldwide in 2019.

As for the revenue made by subscription apps, Sensor Tower points at 21% growth as a result of $3.8 billion that the top 100 apps in this category generated. The total revenue for subscription apps was $4.6 billion in 2019. This figure made 19% of total consumer spending on the Apple and Google app stores for that year.

The subscription model is a source of revenue on an ongoing basis. To keep churn rates at bay and extend user lifetime with this model, you should be prepared to constantly innovate user experience and update your content. This takes up resources, but users are unlikely to pay recurring fees for the same limited content on a monthly or quarterly basis.

Subscriptions will also be especially beneficial if you can measure the services that your app provides or the content it allows access to in units like credits. With every payment, the credit count will renew for your users. If they want more, let them get additional credits through in-app purchases and exchange them for content or services.

For example, when you subscribe to Amazon's Audible app, you get one credit per month, which you can exchange for any audiobook in its library regardless of the price, and prices range from $3 up to over $35 per title.

In addition, you can choose free titles from the Audibles Special section each month and listen to daily news including the *New York Times*, *Washington Post* and *Wall Street Journal*.

In a nutshell, if you are sure that you can provide value for users on an ongoing basis, the subscription model will be a good option for you.

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Affiliate Deals

Affiliate marketing is not an app-specific concept. By using this model, you can earn a commission fee every time someone follows an affiliate link placed in your app and takes specific action.

These actions range from downloading an app to purchasing a product or using a service.

The affiliate approach is more beneficial for advertisers than regular apps in the sense that they are charged per effective consumer behavior rather than ad impression or click. If 298 app users click through an affiliate link but no one buys, shares their contact information or downloads an affiliate app, it costs nothing to the advertiser.

Discount coupons and promo codes generated within your app are probably the clearest example of how this works. The Coupons app, for example, built its whole business on providing users with such codes.

You should consider implementing this model if you plan to partner with businesses that offer products or services in high demand.

Service Fees

Transaction fees, service fees or payment fees can be a powerful source of revenue for apps that are designed as a digital marketplace.

Depending on the specifics of your app business, such as target audience, niche and merchants, you can choose whether to charge vendors, consumers or both. Airbnb, as an example, has two options for service fees: shared host and guest fee (3% and up to 14.2%, respectively) and host-only fee (14% to 20%) as mandatory for hospitality businesses.

Service providers and merchants benefit from the fee model because they only pay you when they get paid, thanks to you. This feature makes this model especially suitable for startups, where the app lifetime and efficiency over time are hard to predict.

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In other words, if your app operates as a mobile marketplace, why not follow the example of eBay, Fiverr, Uber, PayPal and other successful businesses?

M-Commerce

Companies that use apps to sell products and services are in the mobile commerce business.

Mobile commerce (m-commerce or mCommerce) connects smartphone users with merchants enabling deals between them. Offers range from financial services and wholesale to stickers, slippers and private counseling.

According to Statista, sales made through mobile in the U.S. are likely to reach $339.03 billion in 2020, compared with $207.15 billion in 2018. The upward trend is due to the growing security of mobile apps.

If you plan to distribute your goods and provide services within a unique ecosystem, building an m-commerce app is the right choice for you.

In my next article, I will talk about crowdfunding and donations.

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INNOVATION

Mobile App Monetization Part 2: Revenue Generation Models

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

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In my previous article, we defined 11 revenue generation models and explained paid apps, in-app purchases and brand sponsorship. This time, let's focus on in-app advertising and merchandise.

In-App Advertising

Advertising provides the most revenue for gaming and nongaming apps alike. That should come as no surprise because through this model users can interact with your

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app for free, which means that you can grow a large user base and get more people to see relevant offers from a variety of advertisers.

Absolute Market Insights provides another interesting observation-and-projection perspective. According to its research, the market of in-app advertising was more than $66 billion in 2018. The forecast for 2027 indicates it is likely to reach approximately $472 billion, increasing at an estimated CAGR of 24.4% throughout the forecast period.

As for the diversity of industries that can be successfully marketed through in-app ads, consider this recent study by Drum and Smaato. Although 10% of in-game ads are placed in mobile games, the white paper says most in-game advertisers are digital entertainment platforms, retail stores, FMCG brands and auto manufacturers.

In-app ads are different in their format and type. Check out the following six varieties.

1. Interstitial ads: Interstitial ads are designed as natural steps in a user journey throughout the app. They are most relevant for apps that are built upon linear user experience, such as Uber. It takes several steps to order a cab, and you can insert a full-screen ad as one of these steps. According to an AdColony study, interstitial ads perform slightly better than in-app purchases, with ratings of 3.5 versus 3.4.

However, this ad type is not considered user-friendly for utility apps like flashlights. In this case, banner ads are a better choice. Google punishes apps that impair user experience with intrusive overlays by ranking them lower in mobile search results.

2. Banner ads: Banner ads have been around for decades. Initially used on websites, they expanded to mobile app layouts and remain one of the most efficient ad formats.

As users interact with an app, an ad banner stays within their eyesight, allowing them time to consider whether it is something worth clicking or not. In time, the banner switches to another ad.

3. Video ads: Video is today's most popular ad format. Hackernoon found recently that video made up 60% of mobile advertising for 2019.

According to InMobi, video ads boasted double the click-through rate (CTR) of native ads, and 10 times the CTR of banner ads in Q1 2019. And the trend has been upward lately: In Q1 2019, video ads achieved 3.16% CTR on average, compared with 0.26% in Q1 2018. InMobi also noticed completion rates of about 80% and viewability of 91% in Q2 2019.

At the same time, video is a format that can be utilized through different ad types. The previously mentioned survey by AdColony indicates that publishers estimate rewarded video ads and interstitial video ads as the most efficient, rating them 4.6 and 3.7, respectively.

4. Native ads: Native ads are the most creative way of promoting a product or service to app users. Users may not even be aware that they are being targeted by advertising as they come across a native ad. It is typically introduced into UI components in the most unobtrusive way, and it serves a concrete purpose.

Here is an interesting story that shows how this works. A staff member at Adweek was swiping through Tinder, when he matched with a 25-year-old woman named Ava. After a conversation with Ava, he discovered that she was, in fact, a bot promoting Ex Machina, a sci-fi thriller by Alex Garland.

Another interesting example of native in-app advertising is how brick-and-mortar businesses paid to place PokéStops, important points in the Pokémon Go game, at their locations to drive foot traffic.

5. Rewarded ads: Rewarded ads encourage users to interact in exchange for rewards such as in-app currency, items or features. These ads can be presented in various formats including video, a full-screen banner with a CTA, or even a demo version of the product (game or another app).

Rewarded advertising is best for gaming apps, as an alternative to in-app purchases. According to Tapjoy, 76% of mobile gamers in the US prefer opt-in rewarded ads, while only 24% are more comfortable with mandatory ads.

6. Text ads: Just like video, text ads are more a format than an independent advertising model. Some banner ads feature plain text, and sponsored posts on Facebook are also based on this medium.

The average cost per click in one of the two biggest online advertising platforms, Google AdWords, is between $1 and $2.

Merchandise

You can make money with your app by selling branded T-shirts, stickers, backpacks and other items, or selling the rights to other companies to do that for you.

This monetization model is relevant only for apps that are based on a brand that has a substantial, loyal following like Pokémon Go and Angry Birds.

However, this idea can propel you to invest more effort into brand building with your app and securing your proprietary rights. If and when your product gains enough traction to increase the demand for merchandise, you will benefit immensely.

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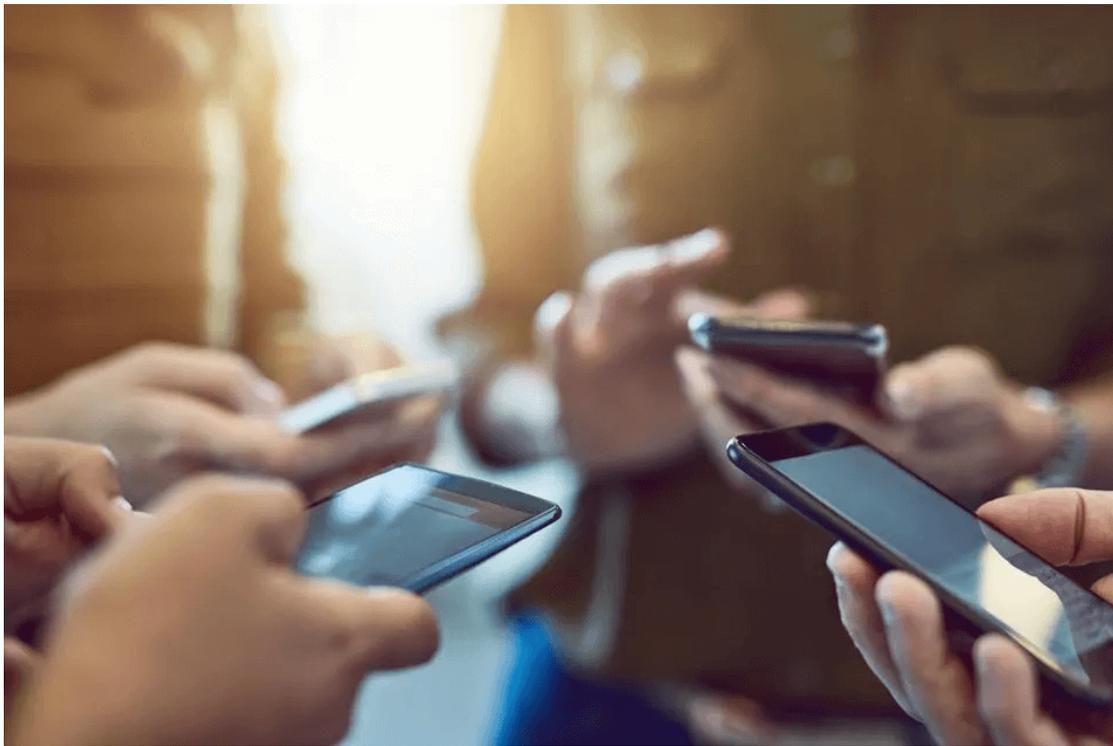# Mobile App Monetization Part 1: Revenue Generation Models

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Apr 28, 2020, 07:10am EDT

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Every time my company, a global software data processing organization, is approached for services by a startup founder with a disruptive mobile app idea, we begin by asking questions to better understand how we can help. We frequently run into the same obstacle: startups not knowing how to monetize their idea.

Statista predicts that mobile app revenue will hit $935.2 billion by 2023. It is important to think of your monetization model early on, so that you can pitch your mobile startup to investors showing your vision through figures, such as stats and

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projections presented by key app performance metrics. Developers monetize their products in many different ways, and you too can find a model that is right for your audience and product.

This article will introduce you to 11 major mobile app monetization models. As you read, remember that you can build your business upon one model, as well as a combination of models you might find suitable for your product and audience.

Navigate Your App Monetization Options With Ease

Here is a basic outline of the revenue generation models to be discussed in this series. When reviewing monetization models based on your company's offerings, consider:

- **Paid Apps:** If your app is a utility, productivity, photo, video or navigation tool.

- **In-App Purchases:** If you can quickly build a large user base and offer wow-level, free experience.

- **In-App Advertising:** There is no "if" — this model is suitable in almost every situation. Just make sure you choose the right ad format.

- **User Subscription (SaaS):** If you can provide value for users on an ongoing basis.

- **Brand Sponsorship:** If there are major brands interested in promoting themselves to your audience.

- **Affiliate Deals:** If you plan to work with businesses that offer high-demand products or services.

- **Service Fees:** If your app is designed to operate as a mobile marketplace.

- **E-Commerce:** If you plan to sell your own products and/or provide services within a unique ecosystem.

- **Crowdfunding:** If you can run a successful campaign and/or you are affiliated with an already popular brand.

- **Donations:** If what you do is highly important for your target audience.

- **Merchandise:** If your app is based on a brand that has a loyal fan base.

I will start the series with the description of paid apps, in-app purchases and brand sponsorships.

Paid Apps

Paid apps are a simple model: You pay a one-time fee to be able to use an app. Once a user has paid, they can access all app features. However, this monetization option is not very popular.

The reason behind the unpopularity of the paid model is the difficulty of ensuring stable revenues over time. It depends on the influx of new users, which takes substantial effort to maintain. Utility, productivity, photo, video and navigation apps can be considered candidates for monetization through a one-time payment model.

In-App Purchases

The freemium monetization model making revenue from in-app purchases is increasingly popular among app publishers. The freemium (i.e., free and premium) concept is that everyone can use the basic features of your app for free. If they enjoy their experience, they can purchase, add on or unlock other features for an additional fee. Sensor Tower reported recently that users spent 17% more on in-app purchases in 2019 than in 2018.

There are three major types of in-app purchases:

1. Consumable: Users can buy in-app currency, items, bungles, lives and other content that can be used once and purchased multiple times. For example, you can buy consumable "gems" on the mobile app game Candy Crush Saga.

2. Nonconsumable: Nonconsumable premium content is purchased or unlocked once and for the entire user lifetime. This can be car wraps, photo filters, character outfits, upgrades, VIP points and more. For example, the productivity app Forest

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allows you to upgrade to the "Pro Version" that, among other benefits, enables accountability partnerships.

3. Feature Subscription: Users can subscribe to particular features, such as daily delivery of valuable items or currency, for a recurring fee. For example, with NFS No Limits, users can subscribe to gold delivery for a particular period.

If you can rapidly build a large user base and deliver top-notch free experience, this model will work for you. Consider mixing and matching in-app purchase types to better suit the needs of your audience and business model.

Brand Sponsorship

Sponsorship is essentially a mix of the aforementioned ad formats promoting a limited number of brands or even a single business within one app.

What differentiates sponsorship from the in-app advertising monetization model is that you do not need to integrate your app with ad networks to run promotional content. Typically, ads for sponsors are more static in nature, and you can tailor them to the needs of the brand as much as the technology behind your app allows you to.

For example, you can add a sponsor's logo to the loading screen of your app or design a section dedicated to a brand in the app layout. Another popular practice is title sponsorship, whereby you change your app's name and white-label its design so that it represents a single brand.

There is also a multi-level sponsorship structure. In this case, brands are served the exposure based on the size of the sponsorship package they pay for.

The sponsorship model might be a fit for your app if:

• It already has gained momentum;

• You can prove that with clear, up-to-date, analytical figures;

• You know your target audience well;

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- There are major brands interested in promoting themselves to this audience;

- You are flexible on the tech side to meet the requirements of your sponsors;

- The potential revenue from sponsors is high enough to ensure the growth of your business.

I will continue to explore the other revenue generation mobile app monetization models in my next articles.

INNOVATION

IoT Threats And What To Do About Them

Boris Kontsevoi Forbes Councils Member

Forbes Technology Council COUNCIL POST →

Mar 31, 2020, 07:10am EDT

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As the adoption of the internet of things (IoT) grows, so do legitimate security concerns about this technology. In 2018, Kaspersky honeypots identified 105 million attacks targeting smart devices.

The impact of internet-connected cars, cameras, speakers, drones, medical devices, climate control systems and similar hardware is increasing. Whether this impact will be positive or negative depends on how well we solve the IoT security problem.

This article offers a look at IoT as a double-edged sword and suggests ways we can address the challenge.

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Troubling IoT Vulnerabilities That Prove The Threat Is Real

We already have a history of IoT vulnerabilities we can learn from. Here are two of the most worrying case studies:

1. Home devices eavesdropping on and manipulating people

Smart assistants like Google Home and Amazon Alexa are increasingly becoming an integral part of our lives. The technology's ability to listen and ask questions makes these devices a natural target for hackers.

The first thing that comes to mind in relation to smart speakers might be eavesdropping, but already, in 2018, researchers discovered cybersecurity problems that allowed perpetrators to phish out sensitive information, such as passwords and credit card numbers, from users.

2. Smart home hacking

Smart home systems can automate most uninspiring household tasks, freeing up your time for meaningful things. But what if someone gained control over your domestic IoT infrastructure?

This is exactly what happened to a Milwaukee couple on September 17, 2019. When they came home that day, they noticed that it was extremely hot, with a Wi-Fi-connected thermostat indicating 90 degrees Fahrenheit.

Setting the device back to room temperature did not help, as the temperature continued to rise all by itself. Soon they heard a stranger's voice and disturbing music coming from a camera in the kitchen.

The couple changed their Google Nest device network passwords, which did not fix the problem. The nightmare did not stop until their internet service provider changed their network ID.

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What IoT Developers Can Do To Mitigate Risks

Developers are accountable for their products. A major breach can ruin a company's reputation and compromise the entire network, affecting thousands of users, so it is imperative for a business to take care of security.

The following are measures that you as an IoT developer might want to take:

• Start at the operating system level using the capabilities of the hardware.

• Ensure security for users every step of the way, from booting to updates.

• Stay up to date with recently discovered vulnerabilities in the underlying technology.

• Educate users. This is something Google Nest, from the example above, failed to do early. After the case went public, its spokesperson explained how to prevent such breaches — but not before it blamed consumers for "using compromised passwords (exposed through breaches on other websites)."

• Set a security check schedule, and stick to it.

What IoT Users Can Do To Protect Themselves

The consequences of an IoT breach for consumers can be irreversible and devastating.

As a user, your security is, to a great extent, in your hands. Here is what you can do about it:

• Select a product by a well-known brand. Obscure companies offer cheaper deals, but they do not care about their reputation. Although there is no 100% guarantee even with an exchange-listed brand, you can expect it to at least make an effort to protect you, along with its good name.

• Follow the security instructions from the vendor. Every IoT product has its specifics and weak points. Most of the latter are known to the software developers and

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manufacturers behind them. If you take the time to review the security section of the manual, you are already on the safe side.

- Know where the power button is. In most cases, you can resolve immediate issues by unplugging your device from the internet. If the problem persists, just shut it down.

- Have a separate, strong password for each of your IoT devices. Set your own password every time you purchase a new product, as default symbol combinations are commonly subject to leaks.

- Run the latest software version at all times. The invisible war between hackers and IoT vendors is in full swing. Once a vulnerability has been detected, developers will patch it and roll out a safe version. Your task here is to update as soon as possible.

- Diversify risks. Just like you separate your private life from work, keep IoT devices from these two areas independent. Then if one is compromised, the other remains untouched.

What Governments Can Do To Protect Citizens And Critical Infrastructure

Smart cities face the same threats as consumer technology, but on a much bigger scale. Even so, when people's privacy, health and lives are in danger, governments need to be concerned with their citizens' safety.

Policymakers should consider the following measures to protect citizens:

- Impose universal security standards for IoT companies.

- Set a clear certification system for IoT products to qualify as secure.

- Encourage gaining trust marks from third parties who test IoT devices.

- Ban the use of default passwords by manufacturers.

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- Penalize manufacturers and developers who sell products with vulnerabilities known to date.

- Encourage manufacturers to inform users what data is collected and how it is processed.

- Support IoT vendors that educate consumers.

- Make lifetime security updates a mandatory practice for developers.

Of course, these measures come with at least one caveat: Authorities should cooperate with manufacturers and programmers in the development of new policies and regulations.

Wrap-Up

The quest for safer IoT environments involves consumers, programmers, manufacturers and governments. Various networks are increasingly interdependent, and when one of them gets hit, this also endangers the others.

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INNOVATION

Clarifying Transparency Within And Outside Your Software Organization

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council   COUNCIL POST →

Apr 12, 2019, 07:10am EDT

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The word "transparency" denotes a lot of things as you move from one context to another. Take the business niche, for instance. Here, transparency is a term used to show sincerity, predictability and oneness.

Every business out there has a secret side that isn't visible to the public, and this could lead to vagueness, which can complicate things in the near future. At the moment, only a handful of companies can say they are transparent. When it comes to a business and its processes, being transparent plays a significant role in determining whether a firm wins or loses out on a partnership deal.

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In software development, specifically outsourcing, transparency gives your company an edge over others. Technically, the resources needed for outsourcing projects are rare and hardly found in facilities near the clientele. This provides a breeding ground for fraud and later translates to a client receiving a bottlenecked, out-of-place budget and below-par deliveries laden with complications.

The ability to stay transparent and trusted for years is a massive differentiator — not just for a software company, but for any enterprise at all. What are the ingredients of the hidden recipe?

Transparency Beyond The Organization

Transparency beyond your organizational confines is one pertinent area that must inevitably be covered. But why are companies in a dire search for clarity in the outsourcing business? They are seeking transparency to cement:

• The expertise and experience they offer as a service provider.

• The commitment of their team to the clients and project.

• Discretion, privacy and data safety.

Customers need assurance in regard to the authenticity, timeline, reach and contract of your business. Entering into a partnership with an outsourcing firm in software development and service provision, clients like the guarantee that there are well-thought-out risks and issue-tackling strategies in place. As a matter of fact, a backup plan of this kind can substantiate your company's transparency policy. Alongside this, it is vital to adhere to guidelines that establish transparency as a standard.

Agile Methodologies

While most companies are aware there isn't a sole route used in all software development, it is clear that vibrant, responsive patterns enforce improved levels of transparency. This isn't just about developmental projects. It is about agility behind the scenes.

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Status Reporting

You can hardly find software providers with clear and detailed reports. The need for proper reporting by your project manager can't be overemphasized. Impeccable reports are an integral part of every project because these software providers are on the scene working.

There needs to be synergy between your client and your team. You must chart the stages involved and check off each task as it comes into play. Appropriately detailed reports give a general overview of the status of your project without causing further confusion.

Tracking Tools

Situation reports aside, your development team must ensure that they employ diverse tools that will enable them to check and make sure your project is high-quality. Some of the instruments you can use to accomplish this include unit tests, frequent integration, regression automation, product metrics accessed via mobile devices for delivered projects, static code analysis, crashlytics and firebase, among others.

These tools provide internal support for your product. If your development team is clear on how, what and where to employ specific tools, your client should be equally familiar with the tools in use — in order to obtain lucid KPIs.

Project Or Customer Portal

In order to stay up to date on central project indicators, customers need a top-notch instrument to supplement the tools above. This can be accomplished with a web- and mobile-inclined portal. With a company portal, clients can stay in contact with your company's management team and gain swift access to all project artifacts.

Process Audits

Process audits are an internal process where your company ascertains if your project is well-documented and reported in line with the highest standards. At the same time, you must check that all activities associated with your project are being done correctly.

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The auditing process is generally optional for clients to partake in, but they can have access to the results if they so desire.

Proactive Project Monitors

One way to ensure your project is high-quality is to employ a proactive project monitor. Your monitor must work with a clear set of guidelines rather than being actively managed, and they generally report to the CTO in your company. This way, your company can analyze projects, detect potential risks and actively try to curb them.

Again, this role has nothing to do with the customer in most cases. However, upon the discovery of a potential threat, your company should report the occurrence immediately and ensure its resolution in the most transparent manner.

On-Site Visits

This practice comes in handy when you need to tackle possible or pre-existing challenges. The following scenarios require on-site visits:

• During the project's inception.

• Any time there is a bridge or shift in the communication process.

• Any time the client meets with the entire team.

• Any time there is a significant software delivery and the client's location is more ideal.

Video Control

Some clients may want to receive live footage from the provider's location. This will lead them to request the installation of cameras. By doing this, they have greater control over the project. Nevertheless, this practice is fizzling out quickly due to the outstanding performance of existing tracking tools.

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Infrastructure For Security And Data Protection

Security is the core of any transparency policy. If any organization really wants to be as transparent as possible, they must follow security rules and standards to the letter. An in-house security policy should include a specially designed infrastructure that maintains the privacy of the client's personal and business data.

With these tips, you're well on your way to establishing clear transparency for your organization. In my next article, I'll cover even more ways to make this vital aspect of your business a reality.

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INNOVATION

The Seven Components Of Meaningful Customer Care In Software Development

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Dec 28, 2019, 07:10am EDT

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"Customer" — one word that conveys the most important part of any business. Everything in the business world revolves around customers. We care about the number of customers, their loyalty to a brand and their satisfaction. Their feedback defines how the business develops and what direction it takes. It is no surprise, then, that the key performance indicators (KPIs) based on customers' feedback are the key points for businesses.

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So what makes for happy customers in the outsourcing business? The answer is meaningful customer care, which is one of the components of predictive software engineering (PSE). These are the elements of meaningful customer care:

- Seamless customer onboarding process

- Customer portal

- Governance model

- Clear escalation path

- Early problems discovery

- Deep customer complaints analysis

- Customer satisfaction control

I'll cover the first four elements in this article and the last three in my next piece.

Seamless Customer Onboarding Process

One of the KPIs in many software development outsourcing companies is the growth of the number of projects (and customers). The nonstop process of searching for new opportunities results in launching several projects per month in different company departments.

With that comes the risk of launching a project the way the project manager wants. In the long run, this results in dozens of projects each running their own way, which is literal chaos. The beginning of the project is a sensitive moment that defines success, and all the critical steps should be handled the same way throughout the company. This may be achieved by implementing a seamless customer onboarding process.

It starts before the actual project when a salesperson discusses the deal with the client. The salesperson introduces the customer into the operation details and explains the project roadmap. This gives the customer a clear vision of the company approach to the request completion.

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Once the customer agrees to proceed, the project processes are launched just as discussed. The project manager assigned to the project reaches out to the customer, and together, they establish the communication, reporting, escalation and other relevant processes needed to fulfill the project's requirements. They are standard for each project, though they may vary in some aspects. In general, though, they are the same. This way, each customer receives the correct onboarding in a company and nothing will be omitted.

It is important to have a standard process from the project start. The project launch is a challenging period for a company. Often it is referred to as a trial period when a client decides if the vendor has chosen wisely. The clear customer onboarding process mitigates the risk of human errors and gives control over project execution from day one.

Customer Portal

The customer portal is, at some point, a continuation of the seamless onboarding process. This tool provides customers with the big picture of what is going on with the project at any time. The customer portal is a web-based and mobile application that gives the project overview based on the following points:

• Project name and a short description

• Project department name

• Project manager and team members names

• Link to source control

• Links to managerial tools: scrum tools, project documentation

• Project quality reports

• Escalation flow activities and description

• Contract management details

- Invoicing and payments history

The customer portal is another great tool that standardizes the process of work.

Governance Model

Every service provider should give every customer their full attention. Sometimes it is difficult to keep an eye on everyone. Applying a governance model to meetings with customers can help.

Establishing the project process during the onboarding process includes the step of setting up the reporting and communication approach. It is called a governance model. Inside it is a list of status meetings with customers that usually have the following model is defined:

- Weekly status meeting with the project manager. This is the meeting where the customer discusses managerial (not tech) aspects of the project.

- Biweekly status meetings with the project manager and the department director that is managing this project on the customer side. This is also not a tech meeting. The members discuss plans, issues, and action items related to managerial aspects of the project.

- Yearly or every six months (based on the customer decision) meetings with CTO and COO. This is a high-level meeting where members discuss general project status and long terms plans.

All the meetings described have a clear objective, structure and format. Detailed templates for each meeting and its format are used.

Clear Escalation Path

With access to the customer portal, the customer receives the escalation flow. From the very beginning of collaboration, the customer knows how to escalate any problem related to the project. This way, no concern goes unnoticed.

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The governance meeting is another process where a customer can escalate problems. Every customer complaint receives a "red flag," meaning that the solution should be provided ASAP. Using this approach, the customer can escalate the issue from a project manager to the C-Suite if it is necessary.

The escalation path follows strict rules and timelines. If the issues were not fixed on the project manager level, the escalation moves to the upper management level. With this escalation path, the customer understands the complaint and issues and that the customer understands that the feedback is guaranteed.

Combined together, the elements of the meaningful customer care principle gives the customer a clear vision of what is happening with the project. The customer understands how to reach out to a software company, how to work with them and what process they follow. It is important for a customer to feel that the business needs are filled. In fact, of all that is obvious; however, few software providers apply these rules. Sticking to these simple truths, a business may make the customer feel that they care about every request.

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INNOVATION

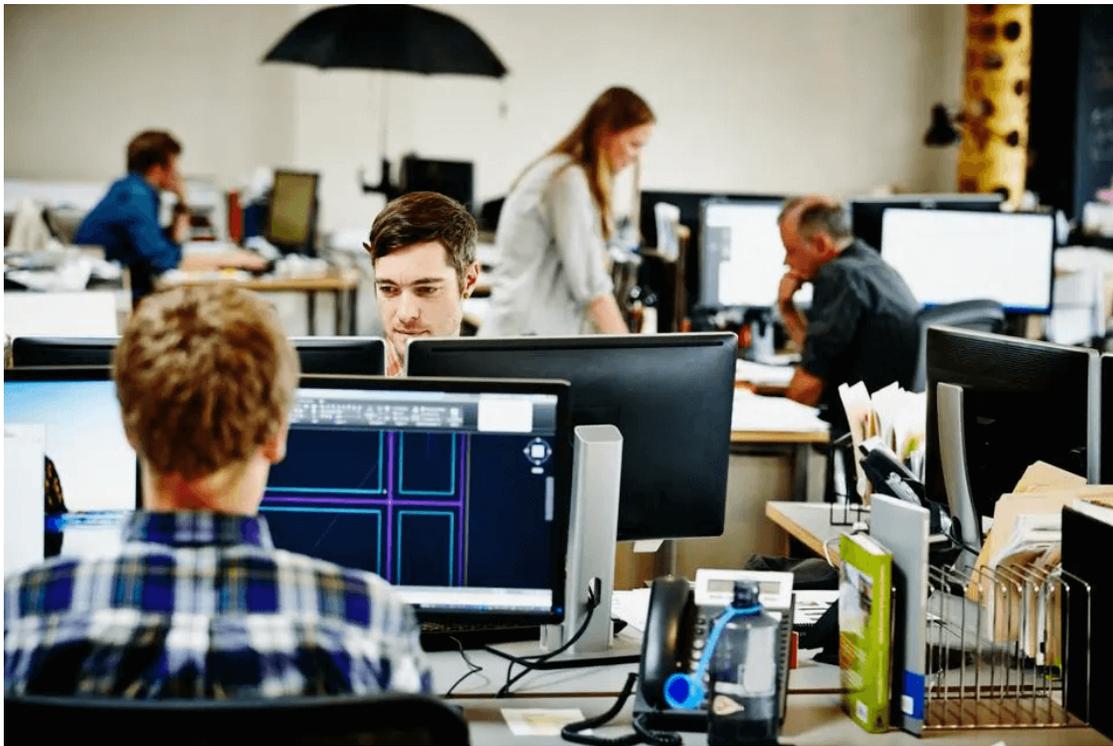# Six Considerations For Leadership Before Implementing A CoE

Boris Kontsevoi Forbes Councils Member
Forbes Technology Council COUNCIL POST →

Sep 26, 2018, 09:00am EDT

Boris Kontsevoi is a technology executive, President and CEO of Intetics Inc., a global software engineering and data processing company.

GETTY

The idea of leveraging the power of centers of excellence (CoEs) has occupied the minds of many business owners. The long lists of benefits and advantages promise unseen success on the market and customer loyalty. However, behind those shiny perspectives stand two major questions: How do we implement the CoEs? How do we make them work?

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The questions are not trivial. A company creates CoEs on top of existing activities, and there are many ways to do that. A lot depends on the company, employees who participate in the CoE and company needs. Yet, there are six components that form the backbone of the whole concept.

Leadership

Who should lead the CoE? Should we assign someone, and if so, how should we identify this person?

These questions arise every time we discuss the CoE concept and its implementation. The ultimate idea is that a CoE is led by a very motivated volunteer.

The main goal of any CoE is to become a new line of business (LOB) for the company. Based on that, the CoE leader is commonly seen as a technical person with a pure vision about the next steps for the CoE, and the plans to transform it into a new LOB.

The essential attribute for the CoE leader is to be a great motivator who brings people to the CoE and manages them. By their own example, the leader shows members how they should participate in the CoE. If a company doesn't have such a person, consider other options. But if such an employee works in the company, try to motivate the person to create and lead the CoE.

Budget

Should the company compensate the employees who participate in the CoE, and how much? Should the company provide the budget for each CoE? How large should it be?

Managers ask these questions when they think about starting a CoE in a company. In the ideal scenario, the employees work in the CoE without additional payment. However, when they finally make a business from the CoE, they should expect compensation from a company.

The employees should work on the idea first, gain knowledge and prove their capabilities. When the CoE becomes a business for a company, the return on investments follows inevitably.

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When creating the center, the company owners may tackle the developers' and managers' reluctance to participate in the CoE with the payment. Well, they just don't want to join. The center should include the enthusiasts who are passionate about the things they are doing -- only in this case they will be successful, and finally get the reward.

Nevertheless, the motivation plan is essential. This is about gifts, conference tickets and books. The industry gurus suggest investing in things that the CoE needs for successful functioning: courses, workshops, hosting and materials. The company should create the environment for the CoE to function, and if this requires some budget, then it should be provided.

Process

The process of the CoE implementation is really challenging. It is for sure an area that should be identified by each company based on its needs. However, here are a few general recommendations:

- Encourage all CoEs in your company to work in a similar way.

- Don't create strict rules and processes for a CoE. This is an area of technical art. Software engineers, for example, probably will not like strict rules.

- A CoE should be launched by enthusiasts, but it should not be a company order.

- It is better to have one person in the company who coordinates all CoEs. The CTO can be a perfect choice.

- Have periodic sync meetings with all CoEs to understand their status and coordinate their work.

Company Integration

How is a CoE integrated into a company? How should it be promoted inside a company? How should it be highlighted inside and outside a company?

The overall answer sounds like, "Make a CoE as public and open as you can." Inside a company, CoE should be promoted everywhere it is possible. Send R&D newsletters to highlight all the achievements of the CoE, like articles published and speaking engagements. Any company communication channel should highlight successes of the CoE and promote these stories.

The CoE should be the interest of the whole company and its management in the first place. Manage the CoE as a part of your company, not a standalone element just for the engineers' fun. The CoE brings benefit when receives enough attention.

Line Of Business

When will a CoE become an LOB? Should we make a new LOB at the very beginning?

Each CoE is different. Some of them will be new LOBs at the moment of creation. In most cases, the transformation of a CoE into a LOB is a lengthy process.

Initially, set up a group of engineers, and establish a CoE. Then, dive into the topic, and do a lot of research and learning. Only when your CoE members confirm they are experts in a technical area should you think about the line of business. Once your CoE members are familiar with the technology, they start generating business ideas themselves in addition to what is already planned. That is why in the beginning, it's worth being patient regarding the CoE results.

Outcome

What if our CoE won't transform into an LOB? What if my engineers fail? Can I have another outcome from a CoE besides the LOB?

A CoE should transform into a new LOB, and it should and must give outcomes to the company from day one, such as:

• Assistance for the current projects if they work with the CoE technology stack.

• Assistance with employee interviews if they work with the CoE technology stack.

• Assistance for sales team if they require help with the CoE technology stack.

• Assistance for company PR strategy by making publications about the CoE work.

These are the practical steps and challenges we responded to while building our own CoEs and the issues other companies struggled with. This approach we followed can help to build your CoE and avoid common mistakes.

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ABOUT

Boris Kontsevoi is the founder and President of Intetics Inc., a leading global software engineering and digital transformation company. Under his leadership, a group of software engineers developed into a truly global technology company with multiple professional certifications and industry awards, including the Global Outsourcing 100, Software 500, Inc 5000, and Global Sourcing Association best-of-class company. Boris has over 30 years of experience leading software development teams and over 50 scientific publications in the field of computer science and automation, he is a Certified Outsourcing Professional, a member of the Forbes Technology Council and the Newsweek Expert Forum, and an inventor of several business service models including Offshore Dedicated Team® and Remote In-Sourcing®. He is an initial creator of the Predictive Software Engineering methodology, as well as TETRA™, a Technical Debt Reduction Platform for a comprehensive quantitative assessment of the quality of software products. He serves as a Distinguished Judge of the WebAward Competition since the year 2000. Boris is a recipient of five WebAwards for various websites, including the new innovative Intetics.com slide website (2021), also included in the Top 100 Tech Innovators and Influencers by the Intercon (2020-2021), the Entrepreneurial Excellence Award by The Business Ledger (2009), the Gamechanger Of The Year by ACQ5 (2017), and the Strategic Leader of the Year by GSA (2021). He is a professional member and contributor of the IAOP, GSA, Forbes, Newsweek, and IDG/CIO.com.

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