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Nonprofits and Artificial Intelligence
A Guide

Written by Allison Fine and Beth Kanter

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Supporting Nonprofit Staff
Investing in the Nonprofit Sector

Last year, Microsoft and NTEN published the first State of Nonprofit Cybersecurity report and found that 59% of nonprofit respondents did not do any cybersecurity training for their staff. None at all. In the 2018 State of Nonprofit Cloud report, also from Microsoft and NTEN, 56% of nonprofit respondents noted that their organization had decided to implement a new cloud service in just the last year.

As a nonprofit, NTEN understands firsthand the opportunities and challenges that come with engaging in a digital world. With organizations making decisions about technologies at the same time that staff training is lagging, the vulnerability of data, service delivery, and effectiveness is increasing.

We know that the research is only part of the need. It helps benchmark where the sector may be and direct us in providing support where most appropriate. Microsoft has invested in NTEN this year to provide resources about the cloud, cybersecurity, and artificial intelligence to increase the capacity of all nonprofits to understand these topics, make plans, and train staff.

Please share these resources with everyone on your team, use the checklists and guides in meetings and to support planning, and let us know how we can help you further.

Amy & Jane

Amy Sample Ward
CEO, NTEN

Jane Meseck
Senior Director, Global Programs & Partnerships, Microsoft Philanthropies

Overview

> **Digital tools don't get socially interesting until they get technologically boring."**
>
> **— Clay Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations (2009)***

Technological developments come in various shapes and sizes. There are small incremental changes, such as the latest version of the software (again!). And then there are genuine transformative moments when a technology fundamentally changes the way we live and work. The last transformative moment was 15 years ago, with the advent of social media enabling us to create and activate large social networks to communicate and coordinate activities at scale with one another around the world. These technologies also made possible the sharing economy, which includes crowdfunding and shared resources.

The next disruptive moment has arrived powered by Artificial Intelligence (AI). AI will have an increasingly significant impact on the way every person lives and works. No, we are not sounding the alarm bells that the robots are taking over. We are saying that Artificial Intelligence will fundamentally change what we know, what we can do, and how we can do it. New tools and processes, some of which are highlighted in this paper, will let nonprofits analyze data to identify patterns and automate tasks that can serve clients faster, more efficiently, and a grander scale than ever before.

AI has been around since the mid-1950s — so what makes it so essential and disruptive now? Computer processing power is dramatically faster than in the past, and the price of computers has gone down, making AI more accessible. And thanks to the Internet, humans have generated vast amounts of „Big Data" over the past 15 years that feed AI algorithms and can generate more accurate and predictable insights.

Similar to previous disruptive moments, AI is now packaged in accessible, non-technical ways that enable everyday people and organizations to use it, sometimes without even knowing they are. If you ever used Netflix, Amazon, or Facebook, you have been using artificial intelligence!

The use of AI by nonprofits will bring many benefits. Initially, it will allow for unprecedented efficiency. Analyzing enormous amounts of data and finding patterns within them will be used to automate mundane tasks and free up nonprofit staff time. It will also help nonprofits move to data-driven decision-making versus gut instincts. This will enable organizations to shift human attention to activities that are, well, better suited to humans. These include building deeper relationships with donors and focusing on longer-term effectiveness and problem-solving. AI will also be used to solve some of the biggest challenges in our times, such a climate change.

This paper provides an overview of how and why AI is important, how it can be used by nonprofit organizations, and the unique opportunities available to nonprofits when their work is infused with AI. Finally, we will discuss the ethical, privacy, and equity challenges that also come along with the AI revolution. The paper also includes an AI Readiness Checklist and a list of resources for nonprofits to read to get up to speed.

Disruptive Technologies in Context: Digital Eras

A disruptive technology shakes up an industry and forces a fundamental re-thinking of existing business models and practices. In addition to creating efficiencies, disruptive technologies remake the relationship between organizations and various stakeholders, which in turn, births a new set of business practices and norms. We are in the midst of a continuum of changes as a result of the ongoing development of a set of digital and online technologies. This framework, created by Jeremiah Owyang, describes six different digital eras based on past, current, and future disruptive technologies.

These phases overlap with each other in real-time. The eras are:

Internet Era:	Organizations' biggest challenge was digitizing information from the physical world.
Social Media Age:	Online social networks alter organizational fundraising and communications as campaigns and ideas spread faster due to the network effect.
Collaborative Economy Age:	This is the essence of the sharing economy wherein people get resources from each other. Uber and Airbnb are common examples. In the nonprofit world, the rise of people-to-people crowdfunding at scale is possible.
Autonomous World:	New technologies using artificial intelligence and machine learning are automating human tasks by analyzing enormous amounts of data. How these technologies can be applied to social change efforts is the focus of this paper.

And to contextualize our current era, there are two more phases to come according to Owyang:

Modern Wellbeing:	We turn to technology to become more human. This includes wellness apps, avoiding technology addiction, and overload.
Off Planet:	Leaving Earth becomes accessible with tech companies developing space exploration. Everyone has a god view, and humanity extends off the earth.

Defining Artificial Intelligence

AI is the process of using computers to automate human tasks. It takes four components for AI to work: Strategy Questions (applying it to your organization's work); Data (lots of it); Algorithms (mathematical models to analyze the data); and Tools (computers and software).

New technologies often take decades to assimilate into our everyday lives. When a technology is first developed, it is often buggy and clunky. It may take years (or in the case of AI, decades) to work out the glitches and make the technology easy-to-use for laypeople and inexpensive. We have just reached the stage of commercial accessibility with AI.

Recent increases in computational power and new consumer applications have brought AI into daily organizational life. We are still in the early stages of the mainstreaming of Artificial Intelligence. Still, there is enough practice over the past few years to provide a clear picture of where and how it will be useful to social change organizations, and what nonprofits need to do to prepare to use the technology well.

The broad term, Artificial Intelligence, encompasses many different types of technologies. Google recently hosted an AI Impact Challenge. In a reflection report, *Accelerating Social Good with Artificial Intelligence*, Google organized the proposals by six types of AI technology: rule-based solutions, machine learning, audio processing, computer vision, machine learning analytics, and natural language processing.

Defining Artificial Intelligence

Table 1 Types of Artificial Intelligence

CORE AI METHODS	
Rules-based solutions	Use explicitly stated rules to make decisions.
Machine learning solutions	Learn without explicit programming, using examples, to develop a model that can make decisions. Deep learning: Using multiple layers of artificial neurons to create a network that can make a decision based on raw input. Applications of deep learning include computer vision and speech recognition.

AI-POWERED CAPABILITIES	
Audio processing	Hear, recognize, and process sound files and other auditory inputs. Speech recognition: Using audio processing to translate human speech into text.
Computer vision	See, recognize, and process images, videos, and other visual inputs. Object detection: Using computer vision to pick out and identify particular objects and/or physical properties. Image and video classification: Using computer vision to understand and categorize or label visual inputs.
Machine learning analytics	Process and understand large volumes of data to identify patterns and make predictions.
Machine learning analytics	Process, decipher, understand, and generate human language. Sentiment analysis: Using natural language processing to measure an author's or speaker's positivity or negativity

Source: *Accelerating Social Change with Artificial Intelligence*

AI4Good

AI4Good is an emerging field that sits at the intersection of big tech companies, AI university research labs, social change organizations, and the world's biggest problems. The technology companies or research labs provide expertise, toolkits, and resources to work with nonprofits to integrate different types of AI like those described in the above table. Social change organizations bring context and sector expertise to the problem. These partnerships are aimed at addressing issues that require massive amounts of data to understand, much less solve. AI4Good covers areas such as healthcare, education, workforce development, humanitarian aid, climate change and other scientific disciplines, and others.

Looking at one area of AI4Good, humanitarian aid, there are many partnerships between organizations and technology companies. For example, Microsoft is partnering with several different aid organizations to apply AI for Humanitarian Action in the areas of disaster response, refugees and displaced people, human rights, and the needs of children. Microsoft partnered with Operation Smile to develop a facial modeling algorithm and Microsoft Pix to improve their surgical outcomes and help more children in need of facial surgeries. Microsoft also partnered with the World Bank, the United Nations, and tech industry partners to use AI to predict when and where future famines will occur — allowing organizations to respond earlier and more effectively, potentially saving more lives.

USA for UNHCR, the refugee agency that provides aid to refugees all over the world in crisis, turned to AI to help with refugee camp planning and mapping for existing camps that are overcrowded and future camps.

Camp mapping is essential, but labor-intensive as field staff typically survey the camps on the ground and upload the data manually. By harnessing the power of satellite imagery with machine learning, this mapping project aims to reduce the amount of labor and staff time needed to monitor camp growth and utilization and allow UNHCR to expand other program areas that assist refugees. They are using satellite imagery to map and analyze this camp and 115 other refugee camps to assist ground site planning teams in their decongestion efforts.

AI4Good Major Players: Technology Company Programs

Microsoft
https://www.microsoft.com/en-us/ai/ai-for-good

Google
https://ai.google/social-good/

Salesforce
https://www.salesforce.org/intro-ai-good-salesforce-org/

Intel
https://www.intel.ai/ai4socialgood/

IBM
https://www.research.ibm.com/science-for-social-good/

While some of these partnerships cover some of the most innovative and existing developments in the AI field, this paper mainly focuses on Machine Learning and Natural Language Processing because these are the most common types of AI accessible to most nonprofits.

Machine Learning

Children often learn to read through pattern matching. A picture of an apple is shown, and the word apple is repeated. Machine learning refers to the ability of computers to understand and make sense of patterns in the same way that people do, but on a far greater scale. In the last several years, access to computing power only previously available in labs or at the largest corporations has been democratized, and any person or organization can access technology digesting millions of pieces of data to identify and reveal patterns.

In short, machine learning uses mathematical models to swim through enormous amounts of data to identify and recognize patterns. When the system recognizes these patterns, it is programmed to respond to perform automated tasks or provide analysis, insights, or predictions.

Here are examples of the use of AI within nonprofits by functional area:

Programs: Providing Information To External Stakeholders

Organizations typically spend enormous amounts of time and money responding to inquiries or screening potential clients. Chatbots are online conversational interfaces that can automate these processes. Chatbots use a combination of machine learning and natural language processing.

In 2016, Facebook opened up Messenger to allow companies (including nonprofits) to program their own chatbots on the platform for the purpose of customer support, e-commerce guidance, content, and interactive experiences. By 2018, more than 300,000 Facebook messenger bots were in use. Also, more bot authoring programs that allow people without technical programming skills to create bots have become available.

Chances are you've engaged with a chatbot without knowing it by clicking on a representative for a company and texting a conversation about, say, how to return the wrong size shoes.

Chatbots increase a nonprofit's ability to interact with supporters 24 hours a day, seven days a week, at almost no cost. Chatbots are available to answer questions and free staff to do other work. Nonprofits appear to be quickly adopting the use of chatbots.

The Climate Reality Bot is designed to educate supporters and build the organization's email list for action alerts. Designed with ChatFuel, it is a simple bot, using close-ended options to funnel supporters to different options on the

lower rungs of the ladder of engagement. This is a simple way to get started using bots strategically and does not take that much upfront design time or customization.

Chatbots can do more than provide information and gather email addresses.

Through its #HereIAm campaign, the British charity Mencap uses a chatbot named Aeren to enable people to experience engaging with a young person with learning disabilities. Mencap reported a 3 percent increase in understanding of the needs of the disabled after supporters engaged with the bot.

Direct Relief, a humanitarian aid organization, turned to Facebook messenger bot when the organization's 1.5 person social media team could not keep up with requests for aid during Hurricane Harvey two years ago. The bot replies to frequently asked questions about the organization's emergency response programs, how to apply for aid, and ways to volunteer and donate. It would have been impossible for staff to reply manually in a reasonable time.

One interesting note about Direct Relief's chatbot experience: most of the questions asked were answered on the organization's web site and Facebook page, but the conversational nature of chatbots helped information seekers find what they were looking for faster and in more engaging ways. This was the benefit of using the bot — to engage at scale efficiently.

Programs: Client Intake & Automating Internal Reports

Understanding and triaging the needs of prospective clients can be an enormously time-consuming task for frontline personnel of social service agencies. AI can be used to streamline the intake process, reduce wait times for clients, and free up staff for other tasks.

Crisis Text Line is a 24/7 telephone line for people in crisis to call. The organization uses AI to reduce wait times for callers and raise red flags for callers in immediate danger. With over 100 million messages processed to date, they turned to AI, specifically machine learning algorithms and natural language programming, to scale their service with great success.

Breaking down internal silos

Knowledge and insights can be buried within the silos of larger organizations. Oxfam took on this challenge by creating and using an internal suite of internal bots and automation tools. For example, it was hard for staffers to share ideas and insights with workers at other Oxfam affiliates. All they had was traditional email for sharing information, which requires people to search thousands of files on internal drives to develop new knowledge.

Oxfam deployed bots to quickly search through the internal communication and files of all 10,000 staff members and create a new knowledge base of ideas and insights. This includes new ideas for fundraising. Bots that build collaboration can help activate an internal culture of philanthropy where everyone in the organization can cultivate and engage supporters and with shared values, vocabulary, and practices.

Fundraising & Marketing

One of the highest hopes for the wide use of AI by nonprofits is reimagining the field of fundraising. Using AI has the potential to move beyond the current norms of „spray and pray" fundraising.

The use of machine learning is baked into many nonprofit CRM databases, for example, Salesforce.org's Nonprofit Cloud and Blackbaud, to identify prospective funders more accurately and provide the kind of information they will find compelling. In addition, nonprofit vendors are marketing a variety of artificial intelligence-driven fundraising tools that have the potential to help fundraisers improve the effectiveness in all areas of their donor funnel as well as be more efficient.

AI for fundraising can have the following benefits:

Prospecting: Prediction algorithms that analyze your donor or corporate sponsor database and tell you which are the most likely ones to make a gift and where you should invest time in cultivation. First Draft is an example of a tool that works with Salesforce.org that generates a weekly action plan for Major Gift Officers that includes suggestions for reaching out to donors with a personal touch, showing them their gifts matter, and how to follow up.

Increase Retention: Just as you can create an AI algorithm to predict new donors, you can also use it to help identify donors who are in danger of lapsing. Blackbaud Target Analytics is an example.

Repeat Giving: AI analytics tools can help you test images and content for social media ads, content, and email content, all to convert one-time donors into recurring donors. Charity: water is using a tool called Quilt.AI that is helping them analyze Facebook ad content to increase conversation rates to subscription giving.

Improve Engagement: There are ways to apply AI to improving engagement online. It can provide analytics based on your data to help you set up and test donation landing pages, develop personalized email messaging, analyze open-ended comments coming into your organization's call-center or web site feedback forms and provide key themes about what donors need to shape engagement and communication effectively.

Fundraiser Efficiency: In smaller fundraising shops where the staff is managing multiple donor programs, major gifts, and corporate sponsorship, it can be time-intensive to review the CRM to figure out who set up meetings with. NeonOnes, a mobile app that uses machine learning, is an example.

Opportunities for Nonprofits

Integrating AI into nonprofit organizations will create opportunities to do more but also to be something new and different, and, perhaps, something better. While the initial benefits of AI are focused on efficiency — saving staff time — there are far more opportunities. Here are ways organizations can use AI to improve their work and organizations:

Become more human-centered. It may sound odd that technology provides an opportunity to become more human-centered, but that is the ultimate promise of AI. When AI-powered systems take over rote, repetitive tasks, it should free up staff time for other activities. This is not a black and white division of labor, with humans doing some jobs and bots doing others. The goal is to mesh people and technologies such that we benefit from the best of both. People should be focused on relationship building using their innate empathy, intuition, and judgment. Think of how much more effective fundraising efforts would be if AI was identifying better prospects and development staff were spending more time with current and potential donors.

Innovation & Collaborative Mindset. Incorporating AI systems effectively into an organization requires openness, curiosity, and a plan to iterate results. Smart organizations will invest in responsible open-sourcing to share intellectual property (e.g., models and web and mobile applications) with the field to amplify the efforts of all organizations. They will also embrace design thinking methods to have a better understanding of the end-user, whether it be an external stakeholder or staff. Besides, a shift away from siloed approaches to gathering data and analysis will be necessary as it is likely that most organizations will need to become part of large data collaboratives to reap the benefits of AI.

Rethinking models. Using artificial intelligence offers the opportunity for nonprofits to do more of what they are already doing – but is that the best approach? Are current models of staffing and fundraising the most effective models? Current fundraising norms have created atrocious retention rates for donors. Using AI is an opportunity to test fundamental assumptions about processes and structures to get to better outcomes.

Challenges

AI poses some unique challenges because the technology is invisible to the end-user and to the nonprofit user. AI also requires a higher level of technical programming skills and, more importantly, data competencies.

Matching the right problem with the right solution. As Google found during its Impact Challenge, organizations submitted proposals with AI solutions that would have been better solved by other technologies. Organizations need to learn more about AI and avail themselves of trusted experts to determine whether AI solutions are the best ones for the problems they are attempting to solve. The first step in any AI project should be pressure testing the concept with an AI expert to determine if it is the right fit.

Data problems. AI systems require large, clean data sets. This has historically been a weakness of nonprofits. Nonprofits generally do not have data collection plans, in-house architects, or analysts. The data that is collected is often not in a digital form or incomplete and in need of cleaning („data hygiene.") In other instances, the in-house data set may not be large enough or not relevant to particular to the problem that the use of artificial intelligence will solve. Before nonprofits engage in AI systems, it is incumbent upon them to have data privacy safeguards and processes in place. Here is an overview of data protection standards and protocols by Ryan Baillargeon.

Reliance on commercial platforms. Most organizations will not have data engineers and scientists on staff to design and implement large-scale data collection and analysis efforts. Therefore, organizations will most likely use machine learning and/or natural language processing already embedded in commercial products or open-source toolkits offered by technology companies. Nonprofits will need to become savvy about picking the right vendor or product for their needs and being able to sniff out snake oil salesmen and their unrealistic claims.

Responsible Use. While most vendors have ethical policies in place, it is incumbent on nonprofits to also apply the highest standards of ethical data use, security, and privacy for their own data sets. There are emerging ethical standards around the use of chatbots that nonprofits will need to adopt.

Another ethical challenge is regarding the use of data and bias baked into AI code that may favor some people or groups of people. This is called "Algorithmic Discrimination." As Virginia Eubanks writes in Automating Inequality, public systems have adopted AI systems with racial discrimination already baked into the code. Nonprofits need to be aware that some algorithms are opinions disguised as code and need to evaluate them across different dimensions with a diverse set of stakeholders to ensure equity. Any AI project should include a risk-mitigation plan for potential areas of unintentional misuse.

Conclusion

The way ahead is not merely to adopt the AI, but to understand its benefits and limitations as well as its impact on current ways of doing nonprofit work, whether it is fundraising, internal workflow or delivering programs. Artificial intelligence will demand that nonprofits do not take a business as usual approach, but focus on innovation, experimentation, and adaptation.

Resources: Research, E-Books, Articles, Blog Posts, and Books

RESEARCH

Fundraising

Machine Made Goods: Artificial Intelligence in Giving & Philanthropy by Charity Aid Foundation
https://www.cafonline.org/about-us/caf-campaigns/campaigning-for-a-giving-world/future-good/machine-made-goods-charities-philanthropy-artificial-intelligence/machine-made-goods-impact-on-organisations-funding
Overview of the current use of AI and the potential in the charity sector from Charity Aid Foundation in the UK.

Venture into the Future of Giving by the Economist
https://drive.google.com/file/d/1tHbUWjYs9i3ZSqFiKKgWHzfQS_ZcLTOc/view
Paper commissioned by the Gates Foundation that looks at a wide range of emerging technology, including Artificial Intelligence, and the potential impact on philanthropy

State of Artificial Intelligence in Advancement/Major Donors
https://gravyty.s3.amazonaws.com/2019aaacstateofaiinadvancement.pdf
Survey of adoption for major gift officers from Gravyty

AIForGood

Applying Artificial Intelligence for Social Good
https://www.mckinsey.com/featured-insights/artificial-intelligence/applying-artificial-intelligence-for-social-good
Landscape analysis of AI4Good by McKinsey

Accelerating Social Good with Artificial Intelligence: Insights from Google Impact Challenge
https://services.google.com/fh/files/misc/accelerating_social_good_with_artificial_intelligence_google_ai_impact_challenge.pdf
An analysis of the over 2600 applications received from the Google Impact Challenge on the benefits, challenges, and opportunities. It also includes a useful taxonomy of project design, the specific type of AI used, and data sets.

AI4Good Summit
https://aiforgood.itu.int/
Annual conference that showcases research and prototypes in the AI4good field.

X-Prize AI Impact Maps
https://impactmaps.xprize.org/
Maps the current projects, opportunities, and challenges in specific problem areas.

ARTICLES & BLOG POSTS

Chatbots

Leveraging the Power of Bots for Civil Society: SSIR by Beth Kanter and Allison Fine
https://ssir.org/articles/entry/leveraging_the_power_of_bots_for_civil_society
Provides an overview of the opportunity & challenges of chatbots for civil society and a variety of use cases.

AI for Fundraising Today: Chatbots and Voice-Activated Fundraising by Beth Kanter
http://www.bethkanter.org/ai-link-roundup/
Overview of chatbots and voice-activated technologies for fundraising campaigns.

AI for Fundraising: Special Report by the Chronicle
https://www.philanthropy.com/specialreport/a-i-and-fundraising-the-futu/201
The potential of artificial intelligence to improve fundraising and the concerns that some in the charity world have about the new technology.

MACHINE LEARNING

What Your Nonprofit Needs to Know About Machine Learning by Global Giving
https://www.globalgiving.org/learn/listicle/machine-learning-for-your-nonprofit
A good primer on readiness.

Demystifying Machine Learning for Global Development by Sema Sgaier
https://ssir.org/articles/entry/demystifying_machine_learning_for_global_development#
What nonprofits doing development work need to understand about AI4Good.

Artificial Intelligence: Snake Oil or Nonprofit Tool
https://radcampaign.com/blog/artificial-intelligence-snake-oil-or-powerful-nonprofit-tool?fbclid=IwAR04erm2F6JCrl-dVaT0HIV58VUI-xe3hnJbJuQ7FjI7n7ENRfwv-niPTZUg
Looks at the current use and potential of AI for online advocacy campaigns.

WHITE PAPERS AND REPORTS FROM AI VENDORS

Nonprofits & AI E-Book from Salesforce.org
https://www.salesforce.org/nonprofit/ai-for-good-ebook/
E-Book provides an introduction to what AI is and how your nonprofit can benefit using Salesforce.org's product Einstein for nonprofits.

AI 101 for Nonprofits from Boodle.AI
https://info.boodle.ai/artificial-intelligence-ai-101-for-nonprofits

This white paper provides a primer for nonprofit professionals to understand the fundamentals of artificial intelligence (and its subset, machine learning), how they work, and how to evaluate and categorize AI technology they may encounter.

NTEN envisions a just and engaged world where all nonprofits use technology skillfully and confidently to meet community needs and fulfill their missions. We support organizations by convening the nonprofit community, offering professional credentials and training, and facilitating community skill and resource sharing.

NTEN reports support the growth and development of the sector through benchmarking the technology goals and challenges of nonprofits, and identifying areas of need. For more, visit **nten.org/reports**.

Microsoft's Tech for Social Impact program empowers nonprofits and humanitarian organizations around the world with technology to advance their missions.

With recognition that many nonprofits have limited IT staff, the program provides solutions and resources that help nonprofits innovate new ways to tackle global issues. For more, visit **microsoft.com/nonprofits.**