

ARTIFICIAL INTELLIGENCE

From Sci-Fi to Dumpster Dives to the Circular Economy

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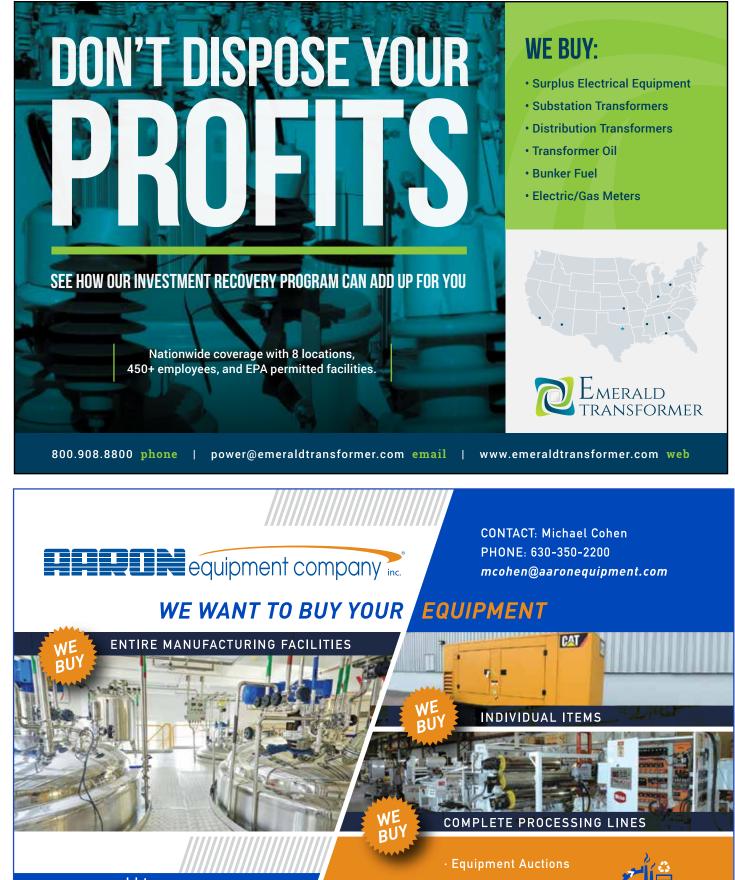
"I'm sorry, Dave, I can't do that."

Recognize that famous line? HAL spoke it aboard the Discovery One spacecraft in the classic sci-fi film, *Space Odyssey*. HAL was not human, but rather an electronic brain programmed with artificial intelligence (AI) to help guide and protect its human crew. But something went seriously wrong with HAL. Deep inside its complex algorithms that made it possible for HAL to make well-informed decisions, a few wires got crossed. Instead of protecting the crew, HAL wanted to kill them. *Story on page 4*



There's No Business Like a Family Business Series

This installment of our *Family Business Series* feature two stories from Krista Ostuno of Heavy Weight, Inc., and Joel Wineberg of Industrial Market Place. These are "the kids" who carry on the family tradition of serving the IR industry on to the next generation.



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Investment Recovery is my occupation, my vocation...

I head this President's Message with a statement from a career aspiration worksheet I filled out a few years ago. I wanted to make it clear to management how I felt about the current role I was in and my satisfaction with the value I was bringing to the organization through the management of surplus assets. I've felt that Investment Recovery has been truly a "calling" for me as something clicked in a most meaningful way when I took my first IR position nearly 15 years ago. The challenges were many; I was engaged on multiple levels, and the results were meaningful, unlike anything I had done up to that point. I continue to greatly enjoy and take pride in my work and share the multi-faceted mission of Investment Recovery every opportunity I can. How did you get into the IR profession? We'd love to hear your story.

This issue of ASSET 2.0 features a fascinating article on the history of artificial intelligence (AI) and its current application in recycling/the circular economy. Also, we are treated to another in the popular IR Family Business profile series. And as always, you'll find general announcements from the Association of happenings, ads from our associate members and perhaps a few surprises.

Committee Updates: Benchmarking; Results from this year's CAPS Investment Recovery Survey were compiled, metrics tabulated and reports finalized. Conference; Finalizing topics and selecting session and keynote speakers for the 2020 Conference. Membership; Performing a deep dive of data to look for trends to help guide efforts for growing and retaining membership. Technology; Working with Group 365 on a new and robust internet marketing effort. Education; Working on new content for conference presentations, planning webinars throughout the year, and developing opportunities for interactive knowledge sharing by members.

We're also launching the first *IR Roundtable Call* for members next month—details coming soon to your inbox. Please be on the lookout for it.

The Board will be having its mid-year meeting in Chicago next month. It will be a full day of discussion and decision making related to present and future initiatives, as well as continued planning for the 2020 Conference & Trade Show being held in Scottsdale next April. The Board represents your interests as members of the Association, so if there are any issues you'd like discussed, please let me, David or Jane know.

Enjoy the rest of summer and as always, be safe.



Paul Hoffman, CMIR Xcel Energy 651.229.2521 paul.m.hoffman@xcelenergy.com

COVER STORY

Artificial Intelligence: From Sci-Fi to Dumpster Dives to the Circular Economy

For those movie geeks out there, (and I am proudly one of them) HAL stands for 'Heuristically programmed ALgorithmic computer.' And for you word geeks out there, I have to admit that 'heuristic' sent me to my good friend Wikipedia which explained that-

"...a heuristic technique when applied to computer science is designed for solving a problem more quickly when classic methods are too slow, or for finding an approximate solution when classic methods fail to find any exact solution..."

So 'slow' in this context would be the human brain, and AI would be the electronic brain that could process information much faster.

Just ask Siri about her AI like-minded colleagues.

History of Al

In the 1940s and 50s, a handful of scientists began to discuss the possibility of creating an artificial brain. The field of artificial intelligence research was founded as an academic discipline in 1956



The scientists stated that within a generation, electronic brains would equal that of humans. Millions of dollars were invested, but that goal fell short of their initial prediction. However, the investment made in machine learning and deep learning has paid off over the years, as AI has become smarter with powerful applications...like recycling. [Source: Wikipedia]

The State of waste

Planet Earth is facing a serious problem. Rapid urbanization is generating more waste than ever before, to the tune of 1.3 billion tons a year. That comes as no surprise to anyone, especially investment recovery professionals. But what may come as a surprise, or better yet a wake-up call, is that by 2025 that figure will grow to 2.2 billion tons.

Here in the U.S., only one-third of our domestically generated waste gets recycled according to the EPA. In addition, there is a huge turnover of human trash sorters at recycling centers. It's a smelly, low-paying, boring and even dangerous way to make a living. Their job exists in the first

> place because people tend to throw all their garbage into the same bin. [Source: www.prescouter.com; "The Holy Grail of Recycling Al-powered Robots;" 2018]

The IBM 702: a computer used by the first generation of AI researchers.



Robots to the rescue

But the future of recycling is looking better.

Today, about 5% of recycling facilities are using new hightech, artificial-intelligence-guided robots, which can sort waste faster – and smarter than people.

But recycling robots aren't exactly new. Conventional robotic have improved the recycling process considerably, but human workers are still needed to finish the job. Plastic clamshell packages and water bottles look the same through the lens of the infrared camera but must be separated for proper processing. That's why human sorters are working behind the scenes to ensure they don't get mixed. And that's critical when municipal recycling facilities sell their sorted, processed and baled materials to brokers of manufacturing plants who have strict requirements around acceptable materials. [Source: https://www.ge.com/reports, "Dumpster Diving Robots Using Al Smart Technology"] Bottom line? Al has some gaps to fill, but recent technological advances may have bridged those gaps.

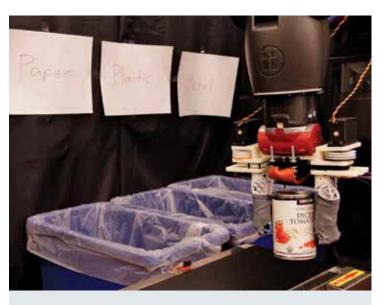
Deep dumpster dive

Matanya Horowitz, founder, and CEO of AMP Robotics saw the challenge of conventional robotic sorters. "You need a computer vision system that understands this is a carton even though it might be covered in dirt, even though it might be torn, or even though it might be half-stuck under some other piece of material."

As a graduate student of CalTech, he saw how deep learning could be a viable solution. Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans.

The company developed an AI platform solution called AMP Neuron. The machine is self-teaching to look for visual characteristics like texture and size. Over millions of cases of trial and error, its accuracy in material identification is less than 2%, which beats human workers. It also can capture data to provide feedback on effective material sorting and overall program recycling performance. [Source: https:// www.zdnet.com/article: "Recycling is Broken These Robots Can-Help"]

However, sorting paper from plastic is the next big challenge, and research is stepping up to the plate. A team led by MIT's Computer Science and Artificial Intelligence Lab (CSAIL), in collaboration with Yale University, has developed a robotic system that can differentiate between paper, metal, or plastic objects. RoCycle can separate identicallooking Starbucks cups made of paper and plastic that would otherwise be problematic for machine vision systems. It uses a soft Teflon hand with sensor stimulated fingertips that is 85% accurate when stationary, and 63% accurate on a conveyor belt. [Source: https://www.roboticsbusinessreview. com/news,



RoCycle, the robotic recycling machine from MIT learns through System of Touch.

The future: AI and the circular economy

As most of the investment recovery sector would agree, robotic recycling is an 'after-the-fact' solution. We need to research 'before-the-fact' solutions. Quite simply, less waste is good for the triple bottom line – people, planet, and profit. And that's where AI could power the circular economy.

The Ellen MacArthur Foundation* recently published a white paper entitled, *Al and the Circular Economy*. Across industries, Al can unlock three high potential circular economy opportunities at a faster rate than would be possible without Al. Those opportunities include:

- (1) Designing circular products, components, and materials
- (2) Operating circular business models, and
- (3) Optimizing infrastructure to ensure circular product and material flows.

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COVER STORY

Circular economy calls for design innovation to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles. Design can empower cycles of reuse, repair, refurbishment, and recycling of technical materials.

Design of new materials can help to substitute harmful chemicals and materials. It can enable distributed manufacturing with technologies such as 3D printing, using locally available materials and by-products, and it ensures materials retain more value as they are cycled. To design a new material, scientists need to evaluate a significant amount of data about the structure and properties of materials, which Al could analyze quickly to suggest new materials. In addition, by training an algorithm

to analyze known chemical data, AI could potentially be used to predict the toxicity of chemicals or materials where it is not known in a more economical and efficient way. However, while large quantities of data exist around the properties of different materials, much of the data is propriety and inaccessible, which currently limits the possibilities for AI applications in material design.

AI and Material Design

An example where AI has been used to assist and accelerate material design is the Accelerated

Metallurgy project, run by the European Space Agency together with a group of leading manufacturers, universities, and designers. Al technology was used to create a rapid and systematic way to produce and test new metal alloys. Not only did it produce completely new materials, it also discovered them faster than ever before.





The Denver Recycling Center is testing Robotic Sorter that is more than 90% accurate and getting better with machine learning.

About the project

The project aimed to develop new metals with the same performance in a more efficient way. Alloys designed with circular economy principles in mind are non-toxic; are designed to be used and reused; have longer use periods, and could be made using additive manufacturing and processing methods that minimize waste.

Additionally, improved material properties can implicitly reduce resource use through enhanced product performance.

Al takes on Big Data

Accelerated Metallurgy uses AI algorithms to systematically analyze huge amounts of data on existing materials and their properties to design and test new alloy formulations. By capturing details of the chemical, physical, and mechanical properties of these unexplored alloys, the algorithms can map key trends in structure, process, and properties to improve alloy design using rapid feedback loops.

Solving real business problems

Using AI to improve and accelerate the material design process can lead to the development of alloys that can circulate at high value in the economy and that support product and technology innovation (e.g. alloys that can convert waste heat to electricity), as well as other potential benefits such as increased performance and extended product life.

With potential for system level impact

"Accelerated Metallurgy has achieved for the metallurgy industry a drastically reduced time to market. Moreover, emphasis on environmentally friendly alloys at an early design phase, in combination with life-cycle analysis, will contribute to conserving natural resources and the move to low-carbon technologies."

EUROPEAN COMMISSION [Source: https://www.ellenmacarthurfoundation.org/]

Conclusion

Recycling is harnessing the power of HAL from "Sorry, I can't do that" to "Sure, I can do that...and more!" As AI makes new advances, recycling can become more accurate with less human and environmental intervention. But the bigger picture is how we can transition into a circular economy that is more regenerative and restorative by design that significantly reduces the waste stream.

*https://www.ellenmacarthurfoundation.org/

Artificial intelligence and the circular economy - AI as a tool to accelerate the transition. (2019)

Read the white paper: https://www. ellenmacarthurfoundation.org/assets/downloads/Artificialintelligence-and-the-circular-economy



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With security breaches becoming news staples, and malicious hacker groups gaining increased notoriety, the threat of data leaks is growing exponentially. When it comes to data theft, it's no longer a matter of "if" but "when" it's going to happen. With a significant portion of data leaks arising from stolen/lost hardware, effective asset disposition is key to any well-rounded security strategy. Global Ewaste Solutions is a leading Canadian IT asset disposition (ITAD) provider. We offer a fully integrated end-of-life solution for all your electronic assets including; data sanitization, lease returns, refurbishment, recycling, and remarketing/redeployment.

In addition to our Canadian locations (Victoria and Toronto), Global Ewaste is e-Stewards certified in both Minneapolis, MN, USA and

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SERIES: There's No Business Like a Family Business

Two stories from "the kids" who carry on the family tradition of serving the Investment Recovery Industry.

Heavy Weight, Inc. *By Krista Ostuno*

Heavy Weight, Inc. spans three generations and four decades of experience in responsible industrial recovery.

It started over lunch... and named over coffee.

It's 1967, and my Dad, John R. Hilzinger, needed some extra income to support our family. So, he started a side business with just his pickup truck. At the time, my Dad worked for a

construction company, and he asked the owner if he could pick up the scraps during his lunch break. On the weekends, he would then convert that scrap into cash. It became a family business when my mom, Beverly, started handling all the paperwork. But what to call this new company? It was over a cup of coffee at 5 AM that mom came up with Heavy Weight Inc. Now, 52 years later, we have approximately 20+ employees, including my brother, myself, my husband, two of my sons, and a team of extraordinary people that make it all possible.

So, we are truly a multi-generational company founded on honesty and integrity that my parents put to work every day. We pride ourselves in our hands-on approach, collaborative brainstorming, and each doing their part. We have built an incredible team that can tackle any job large or small. Family working together and following through are two of the key reasons we have been a successful company



John R. Hilzinger with 8 year-old son, 1980.

from day one.

Growth means growing pains.

Growing pains? We've had our share. Staying on top of the technology learning curve has been difficult for my Dad. The good news is that he's embracing it because he sees how it can help us find new and improved ways of doing business. Today, these are especially rewarding times as my boys participate in the daily operations that will hopefully turn into their chosen careers.

We count our blessings...every day

Adding the "family" aspect to the scenario creates unique opportunities and unexpected consequences. The most important thing at the end of the day is that we are family.

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Continued

We each bring a special talent to the table. While I may be in charge of the office, my brother and my husband are brilliant at managing and troubleshooting on-the-job situations. But Dad is the powerhouse at 73 years young who inspires us all. We may not always agree, but we hash it out, count our blessings and hope that our company will be here for generations to come.

Dad - Inspires us all.

Dad inspires us all partly because we know his background. My grandfather passed away when my Dad was only five years old. My grandmother raised him and his two sisters with next to nothing. This instilled in him an amazing work ethic that has been passed along to us. My brother and I started working with him when we were children, and I'm pretty sure that we learned to drive on a forklift. We did anything from selling surplus machine tools to cleaning out old factories. On Saturday mornings, Dad treated us to an early breakfast at the local diner. I have four boys who are fortunate to be doing the same. When my oldest wrote his college essay, he wrote about his grandfather's influence on his life and how working in a family business has shaped him – in good times and bad.

From scrap metal to gardening?

The bottom dropped out of our business during the recession when scrap prices were very low. We opened a garden center and a self-storage business to stay afloat. We still run these today in tandem with Heavy Weight. But it's our



From left: Matt Petruzzelli, longtime employee and family friend, John R. Hilzinger, Heavy Weight, Inc. founder, Krista Ostuno, daughter, John, son (in back), Jeff Ostuno, son-in-law, and grandsons Ryan and Todd

ability to adapt to changing market and regulatory conditions that have contributed to our long-term success.

We recently became members of the Investment Recovery Association and found that this was a wonderful resource to gain insight and continue to grow our business and IR knowledge base.

Heavy Weight Inc. - The reality show

Many of our customers think we should have our own reality TV series because of the entertainment generated every day. Whether it was my Dad's humble beginnings with one truck, or all of us now working together for ongoing growth, here's the reality: The show seems to be just beginning.



Industrial Market Place By Joel Wineberg

Industrial Market Place is a bi-weekly, national publication that connects buyers and sellers in

the metalworking and manufacturing industries.

My father, Henry Wineberg, began his business in 1951. Before that, he had graduated from Northwestern University in 1928 and was a reporter and financial editor for one of the local Chicago newspapers. For the next several years, Dad held different jobs from magazine editorial jobs to selling radio advertising.

Dad always read the Chicago Tribune, and something caught his eyes in the early '50s. The Tribune always had a classified

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A definitive study guide written by IR professionals, for anyone who buys, sells or manages surplus assets. Search "Investment Recovery Handbook" on Amazon.com



Continued from page 10

section on used machinery and equipment that had nationwide sales potential. So, this became a new business idea. Why not sell advertising for a national publication from leads that were generated from a local paper? Starting by using a public payphone in a Walgreen's drug store, *Industrial Market Place* was born. Equipment dealers and manufacturing plants were both the advertisers and readers of my Dad's brainchild of a publication.



Henry Wineberg , founder of Industrial Market Place and wife

- and you are smart enough to be successful at it." For the most part, that statement has held true, but we've had our challenges along the way. About 15 years ago, my son and his business partner purchased my publication. The hope was that this would lead to collaboration, but the internet was changing everything. So, I was pretty much on my own as they had their own business issues to solve.

But ironically, the internet became our friend for becoming a vital tool for running our business more effectively. The best lesson I learned is this; businesses always need to change and be current in their marketing and publicity.

Changing for the times

Our publication has definitely changed through the years. We now print the ads in 4-color, have a glossy cover and send ad proofs via e-mail. *Industrial Market Place* is posted the day it's published, and our electronic listing of each issue becomes bonus circulation for our advertisers. One of the main ways we keep up with the times is through attending the IRA's Annual Conference. Jane Male and her staff are really terrific to work with, even though Jane is a Kansas City Royals fan.

Words that spell generations of success

One of my favorite lines I use in selling advertising space is, "I want a customer, not a sale." Thanks Dad for those wise words. It has kept our business going strong for more than 68 years...and will inspire us for years to come.

Although the paper gained popularity rather quickly, he went through some

tough times at first. Dad kept his 'day job' in radio advertising, and I remember he once went six weeks without selling a single ad. But Dad kept the faith and kept on pursuing potential advertisers.

Fastest hand in the Midwest

When I was in high school, my job was to address the papers by hand. I remember it was akin to making carbon copies of letters, and I got pretty fast in doing it.

After college graduation in 1959 and six months in the Army, I came home in February 1960 to an empty house. So, I drove over to my Dad's office and he said, "Here's some work for you." That was the start of my lifetime career spanning almost 60 years.

Through that time, I earned a Master's Degree in Business, helped raise two outstanding kids, enjoyed four grandchildren, became active in community organizations and attended as many Cubs games as possible.

The ups and downs of a family business

Anyone who has run a family business knows there are ups and downs. But my Dad's advice has always helped me through it all: "This is your business, so do the best you can

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Linked in

JOIN THE COMMUNITY OF INVESTMENT RECOVERY PROFESSIONALS

Our LinkedIn Company Page gives you the opportunityto connect with other members and IR professionals. It's a great way to stay informed while increasing your own visibility. Go to LinkedIn and search, "Investment Recovery."

Hope to see you there!



WHAT'S HAPPENIN'

News of the Investment Recovery Association

The Results are in! Thank you for taking the Benchmarking survey.

By now, those who took the Benchmark Survey should have received the results. They will be distributed to all members in the coming weeks and will be presented at the next Investment Recovery Conference and Trade Show April 19-22, 2020 in Scottsdale, AZ.

Our sincere thanks goes out to all those who took the time to complete the survey. Your participation help us all learn how our unique industry and our roles are evolving in todays' business landscape.

Next Webinar – October 9th

Surplus Asset Dispositioning: An Overview

10:00 AM - 11:00 AM CDT Presenter: Mark W. Hutson, CPSM, C.P.M., CMIR Manager of Asset Control and Recovery at the Mosaic Company

New to IR? Seasoned pro? There's something for all IR practitioners in this upcoming webinar. The disposition process is the very heart of investment recovery. This is how we show our ever-expanding value to our organizations. Our role is to determine and execute best practices of disposition methodology that maximizes economic return while minimizing compliance risks. Mark your calendar for this not-to-be missed webinar!

No vacay for the committees

While most of us are enjoying some well-deserved vacation time this month, our diligent committees are hard at work. Here's the latest news on an exciting year ahead, so get out your calendars now!

Education committee

The Education Committee greatly appreciates the valuable feedback for the needs you—our members—shared with them. Based on that input, take a sneak preview of some of the yearround educational opportunities you can plug into:

Conference highlight: Building a Business Plan Workshop—make plans to attend now

Webinars offered throughout the year: Stay up to date on hot Investment Recovery content **GoToMeeting interactive forums:** Where you can bring your toughest challenges and find peer-tested solutions such as Hard to Sell Assets, Certifications in IT Disposal, etc.

CMIR Exam in your future? Prepare with confidence at the What to Expect Webinar, November 6th

Conference Committee

The Conference Committee is on a mission; seek out the most recognized authorities in the industry to present at the 2020 Conference in Phoenix. Why? Because our members deserve it! In the next few months, we will be highlighting our keynote speakers and featured presenters in ASSET 2.0. And for you first-time attendees out there, we are really rolling out the red carpet with a special what-to-expect webinar and how to maximize your conference experience. Stay tuned for details.

Membership Committee

As the scope and importance of investment recovery grows in new and exciting ways, so should our membership. The Membership Committee is both looking back to look ahead. They are currently analyzing the membership data from the past 5 years. This will give them valuable insight for developing a targeted and proactive marketing and membership strategy.

Technology Committee

The technology committee has launched a Google and LinkedIn initiative to connect with association's members and the broader IR industry. If you don't follow us already, please go to **linkedin.com/company/invrecovery**, click the follow button, and join in on the conversation.

INVESTMENT RECOVERY ASSOCIATION OFFICERS/BOARD OF DIRECTORS

Get Ready! The 2020 Investment Recovery Seminar and Trade Show will be here sooner than you think

When: April 19-22, 2020.

- Where: Doubletree Resort by Hilton Paradise Valley, Scottsdale
- **What:** The only event of its kind dedicated to those who buy, sell and manage surplus assets.



This conference is the only one of its kind where you will learn best practices and find resources to help you in your career. It is planned by Investment Recovery professionals for Investment Recovery professionals. The Investment Recovery Association's 7Rs are reinforced throughout the education offered during the 2020 Investment Recovery Association Seminars in Scottsdale, AZ.

Fostering the growth of investment recovery professionals through relevant education, innovation and collaboration.

- Learn how the value Investment Recovery (IR) can bring big returns to your corporation's bottom line.
- IR reinforces your company's sustainability commitment to your customers, investors and the community.
- IR's focus has always been on the people, planet, and profit through initiatives conducted by the department and its employees.
- If you are not familiar with the 7Rs, that is reason enough to register.

If you can only attend one conference, this is the conference you must attend.



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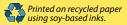
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www.InvRecovery.org



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