AMCS

The Digital Transformation Barometer 2018

A Global Survey of Digital Transformation
in the Waste Management & Recycling Industries

00
Start

Contents

Foreword - Digital ways to a cleaner world

Our society is increasingly concerned with sustainability and quality of life in a world where a growing population uses more and more resources and creates more and more waste. People now use 34 times more of the world's resources than they did just 100 years ago. Waste management and materials recycling are set to play a greater role than ever in increasing sustainability and improving our quality of life. As society changes, so do the business models of waste management companies.

Changing business models will drive the need for more sophisticated technologies and intelligent IT platforms. Waste & recycling companies are increasingly moving their business into the digital world, taking advantage of modern technologies.to optimise the business whilst supporting the ongoing transformation of the industry to a circular economy.

We designed the Digital Transformation Barometer to gauge the level of progress organizations in the waste management and recycling industries have been able to make toward aligning the most important operational elements that determine whether a digital transformation can be successful in improving the way they do business.

Digital transformation is more of an evolution than a revolution, and a successful transformation is one that follows a step-by-step process of implementing the best solutions for where the business is at right now. Our model, based on five operational drivers of the digital transformation process, is defined by five different levels of maturity. From the research, we were able to identify some of the most common characteristics of organizations at the different maturity levels, and we have also provided some tips for further digitalization that can help an organization progress to the next level.

Success for life

At AMCS, we are driven by the results we deliver and are passionately committed to our customers' success 'for life.' We are focused on driving practical circular economy innovations for a sustainable planet, and our intelligent, predictive platforms are meant to empower and support our customers in that ongoing transformation. We help waste management and recycling companies to operate smarter, more seamlessly and more digitally with ultra-modern scalable platforms based on the best practices of thousands of companies across the globe.

I hope you find the AMCS Digital Transformation Barometer useful for your own organization in providing you with a roadmap and specific ideas for how to take your digital transformation to the next level.

Sincerely,

Mark Abbas
CMO & Director of Business Development
AMCS Group

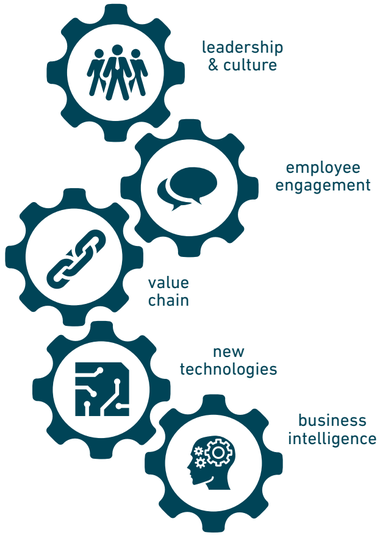
01 Introduction

The call to increase sustainability, including global measures such as the Paris Agreement, have prompted most countries and communities to act on better resource and waste management. The Chinese import ban in 2018 of 24 categories of solid waste has had a significant impact on the price of recyclables in North American and Europe and left tons of waste with nowhere to go. At the same time, the cost of waste management is growing while sophisticated customers demand an effortless experience and reliable service. The advice to the waste management industry is to find productivity gains in software and digital solutions.

Whether a municipal service or private company, the digital transformation of waste management and recycling processes are a must for organizations looking to take advantage of growth in the market while reducing costs to maintain an effective and competitive edge. The question is no longer when to make the digital transformation, but rather where to get started now if you haven't already, or what to speed up if you have.

Taking advantage of changes in the marketplace requires a certain amount of innovation. Part of that is increasing collaboration with other organizations in the value chain. Another is using new technology and data to coordinate and steer a better process.

Digital Transformation Barometer



The Digital Transformation Barometer measures how much progress organizations in the waste management industry have already made toward digitally transforming their businesses, and how much still needs to happen. It also provides a benchmark that organizations can use to gauge their own progress compared to others in the industry.

About our Digital Transformation survey

Various factors in the organization influence management's ability to implement a digital transformation, as well as the success of its outcome. For our survey, we defined a set of five specific organizational drivers that should be in place if a digital transformation is to be effective. Together, these five operational drivers form what we call the *Digital Transformation Model*.

Our survey measures the two dimensions of this model: the *level of awareness* on one side, and the *progress in action* on the other. Survey participants were first asked to rank the importance of each of the five drivers of the model to determine where the business has set its priorities for digital transformation.

Then participants were given the opportunity to rate their own organization's progress on specific activities and actions related to the five drivers. The results of this second part, the progress in action, make up the Digital Transformation Barometer, which we explain in Chapter 2.

Taken together, the two dimensions – awareness and action – can tell us the level of maturity of the digital transformation within the organization. For the individual organization, pinpointing your place in the maturity model marks a starting point for creating the roadmap to successful digital transformation.

In Chapter 3, we take a closer look at how this maturity model translates to the operational phases of digital transformation and what that means for individual organizations. And later, we also examine the organizations in our survey that are already ahead of the game, ranking at the top level of the model. Seeing what it is they do differently from the rest provides us with interesting insights into where a less advanced organization could put more focus to increase the chance of success.

02 The Digital Transformation Barometer 2018

For our 2018 Digital Transformation Barometer survey, we asked participants to tell us how they would rate their progress on the five organizational drivers of digital transformation. These five drivers represent the conditions that need to be in place in an organization to make digital transformation both possible and successful. Overall, the respondents in our survey gave themselves a score of 6.3 out of 10.

How would you rate your organization on digital transformation? (from 1 to 10)

To gauge the level of progress for the barometer, respondents were asked to rank their organization on a scale from 1 to 10 on how much action has been taken toward implementing the five operational drivers of digital transformation and whether they receive enough attention from management. Are these operational elements sufficiently on the radar within the organization? Are they actively being implemented?

Participants indicated the extent to which they 'completely disagree' (1 point) or 'completely agree' (10 points) with statements about their level of progress on specific aspects related to the five organizational drivers of digital transformation in our model. A score of 6 points or higher (representing the positive answers) is defined as sufficient, or a passing grade, if you will. Anything less than 6 points represents a failing grade.

The resulting score of 6.3 for our 2018 Waste Management Digital Transformation Barometer represents the average of all responses for all five drivers taken together.

In Chapter 3, we take a closer look at these five key drivers and what they mean for organizations making the digital transformation.

3 Key Findings From the Research

1 Digital transformation requires leadership in change management

From the results of our survey, it's clear that leaders in the waste management industry are very much aware of how important the 'soft' drivers such as good leadership and engaged employees are to a successful digital transformation.

When we asked survey participants to rank the five drivers that contribute to success in digital transformation by their level of importance to their business, employee engagement came in at the top of the list with an 8.2 out of 10. Not far behind, at 8 out of 10, was the impact of a winning leadership, teams and a culture that gives people space to do their best work.

When we then asked questions about how well their own organizations performed in these same drivers, 83% of those surveyed said they had the right leadership and culture in place to be able to realize a successful digital transformation. Very few respondents rank themselves below a passing grade on the 'softer' drivers.

2 The digital part of the digital transformation is the most challenging

Most of those surveyed agree they have the softer leadership and employee engagement drivers in place to make a successful digital transformation. However, the 'harder' technology and data science operational drivers are still proving to be more challenging. In fact, 60% of respondents gave themselves a failing grade in new technologies. The scores for business information were slightly better, but still nearly half (45%) saw themselves as failing.

3 Legacy systems are the biggest challenge to successful digital transformation

For 54% of those surveyed, legacy applications and systems still form a significant barrier to fully implementing a digital transformation. It is difficult to optimize processes when legacy systems contain contaminated data and do not work together smoothly to share information and increase efficiency. In the worst cases, legacy systems that do not communicate can make process automation slower rather than faster.

The legacy systems barrier is the area with the least amount of progress among respondents. Only 46% said that that these challenges had been somewhat overcome.

Expert review

ISWA
International Solid Waste Association

The Digital Transformation Barometer 2018 is unique, innovative and a very interesting approach to gauging the on-going digital transformation of the waste management sector. I believe that this report, together with ISWA's survey on the impact of the 4th Industrial Revolution on the Waste Management Sector (https://www.iswa.org/home/news/news-detail/article/press-release-waste-management-will-be-transformed-by-new-technologies/109/), offers a comprehensive view of the maturity of digitization, highlighting the understanding, expectations, and readiness in the waste management industry. Although the whole report provides important insights, there are two specific points that immediately captured my attention.

First, the fact that the "best in class" participants have two important characteristics in common:

They already use advanced digital tools with a solid IT infrastructure, and
They appear to perform more complex activities than the rest of participants, with a broader coverage and larger fleets.

In this digital age of 'overnight' success stories such as Facebook and others, the long, hard path to success is easily ignored. But in reality, the digital transformation of a company or municipality is not something that happens overnight and it's not something that can be created simply by administrative decree. It requires the gradual introduction of multiple layers of digitization and the ability of management to build upon each new digital layer. When you approach digital transformation in this way, eventually the law of increasing returns kicks in and accelerates the transformation toward a new digital business model. The virtuous cycle of positive feedback generated from the digitized processes then creates a willingness to take the next steps, and a guide for which course to follow.

Second, while reading the report it becomes obvious that the more profitable an organization's current non-digital business model is, the less urgency they seem to have for adopting measures and policies that would stimulate a digital transformation.

To me, underestimating the necessity and the urgency of a digital transformation is a potentially lethal business mistake, regardless of how healthy and profitable an existing business model might be. These entities are ignoring a very basic principle. Digital transformation changes an organization's viewpoint, its perspective on the market and its business environment – it evolves and supports the entire ecosystem. Ignoring the digitization process, or delaying it for too long, creates a tremendous risk of being left behind in the IND 4.0 business evolution. It reduces substantially the organization's ability to identify relevant and profitable new opportunities. And as we all know, the biggest barrier to a company's future success is its past success.

I think that from a careful reading of this report in its entirety, a common theme emerges that is worth highlighting: a successful transition toward digitization requires a certain shift in management practices, but in many cases the form that shift will take becomes clear only after the first steps. So, the best option for management is to prepare to fight many battles that are "small enough to win" and generate positive feedback, but "big enough to matter" so that they start to shape a new digital landscape. After all, we are not talking about digitizing organizations simply to improve them. It's about helping them adapt in a rapidly changing digital world.

Antonis Mavropoulos
ISWA President

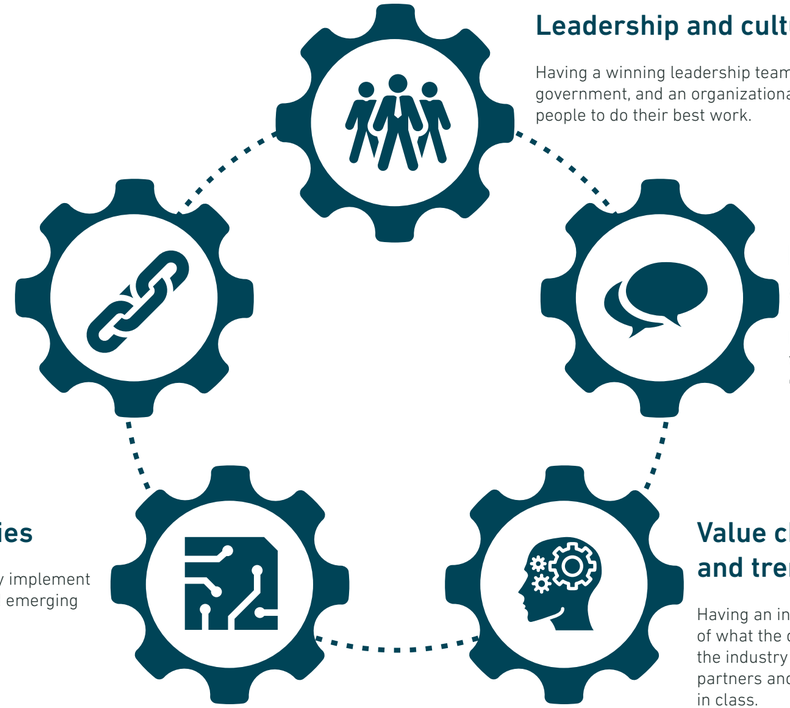
03 Digital Transformation Model

The five operational drivers we tested for the survey are based on a set of ideal operational conditions that need to be in place for digital transformation to be successful. Together, these five drivers make up the Digital Transformation Model.

Our Digital Transformation Barometer survey measures how much progress organizations have been able to make in their digital transformation process. For any progress to be made, however, there must first be an awareness within the organization of just how important these elements are to the success of the digital transformation.

Our Digital Transformation Model takes both aspects – awareness and action – into account and gives us a way of looking at the level of maturity for the digital transformation within the organization. In a nutshell, maturity is factor of both importance and effort or progress. The ideal situation – 100% maturity – would mean that all organizational drivers have top priority, and all are perfectly implemented and organized.

The Digital Transformation Model



Leadership and culture

Having a winning leadership team, (city) council or government, and an organizational culture that enables people to do their best work.

Employee engagement

Driving digital excellence with employees that are engaged in the process.

Value chain, partners and trends

Having an in-depth understanding of what the digital trends are in the industry and collaborating with partners and suppliers who are best in class.

New technologies

Being able to successfully implement and make use of new and emerging technologies.

BI and data science

Using data to inform and guide decisions.

AWARENESS - level of importance

For any meaningful progress to be made in the digital transformation, there first needs to be enough awareness of the importance of those elements that help drive transformation within the organization. A successful digital transformation often means a huge shift in the way an organization operates. Managing that shift requires focus.

In our survey, we first asked respondents to rank the five organizational drivers on a scale of 1 to 10 by how important each one is for their own business. The results present a picture of both the level of awareness in the industry and the order of priority given to each driver.

ACTION - level of progress

In the second part of our survey, we asked participants to rate their own organization in terms of how well they have been able to implement the five organizational drivers in our model. (As we showed in Chapter 2, these results make up the Digital Transformation Barometer 2018.)

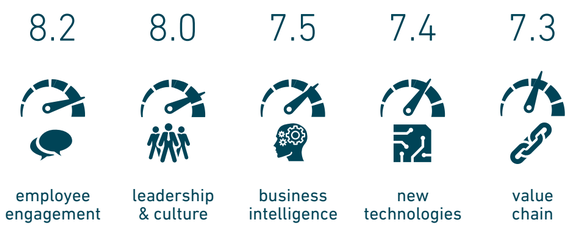
The results show the level of progress the waste management industry has achieved on the critical elements that contribute to a successful digital transformation. Interestingly, the progress scores for the five drivers are considerably lower across the board than the level of importance each driver received from our survey participants. Clearly, there is quite a bit of room for improvement in most organizations in actually getting the five drivers on par with their level of importance.

MATURITY - level of success

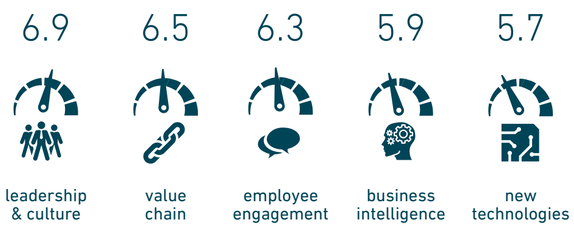
The Digital Transformation Model gives us a way of looking at how advanced, or mature, the digital transformation is within the waste management industry. The level of maturity is a factor of both awareness and action. Using the same scale of 6 points out of 10 representing a passing grade, we can define any maturity level over 60% as good progress, while any level below that still has a lot of work to do. As the graph shows, however, the average maturity levels across the industry for each of the five organizational drivers tend to hover at or below the halfway mark.

To calculate the maturity level, we took the average scores given to both awareness and action as percentages and multiplied them together to get the maturity level percentage.

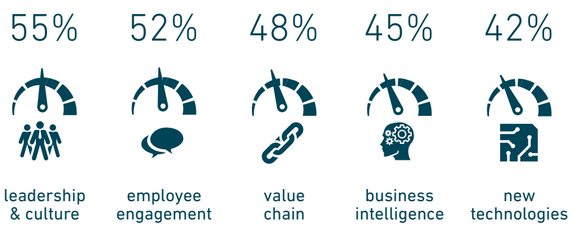
Operational driver importance ranking (on a scale from 1 to 10)



How well have the digital transformation drivers been implemented?



Average Waste Industry Level of Digital Maturity



04

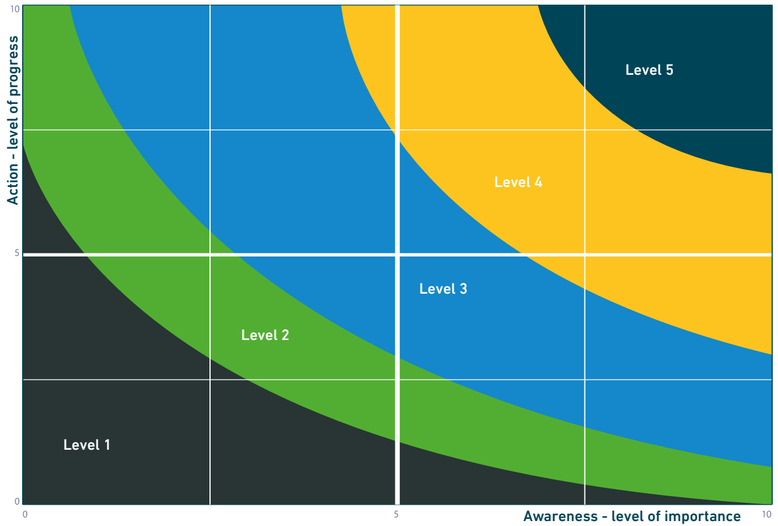
Steps to digital maturity

Organizations at the various levels of digital transformation maturity tend to focus on many of the same sorts of challenges and innovations. They also tend to have implemented the same types of digital solutions to improve the efficiency of their organization.

The priorities the waste management organizations in our survey indicated they have at their various levels of digital transformation maturity give us a kind of blueprint for moving through the digital transformation process. Organizations working their way through the digital transformation can take a cue from others in our survey and see where to start shifting focus to move toward the next level.

Digital Transformation Maturity Levels

None of the respondents in our survey ranked in maturity level 1 (less than 20%). Nearly all the organizations participating in our 2018 Digital Transformation Barometer indicated they have a good level of awareness of the value the five operational drivers bring to the digital transformation process. The following top-five focus blueprints are useful for determining 1) what is missing in the organization to complete the current maturity level, and 2) where to start focusing to move on to the next level.



Level 2 - 20-40% Maturity

The digital solutions used most often

1. Tablets (in vehicles)
2. ERP system or best of breed back-office software
3. GPS monitoring
4. On-board weighing
5. Customer self-service web portals

The operational challenges on the most horizons

1. Digitizing business processes (automation)
2. Harmonizing and optimizing business processes
3. Managing business growth and complexity
4. Creating a culture that embraces change
5. Route management and optimization

The management priorities on most agendas

1. Customer satisfaction and loyalty
2. Increasing productivity and efficiency
3. Digital transformation (digitizing current processes)
4. Employee satisfaction and loyalty
5. Cost reduction

The technological innovations on most 5-year plans

1. Route management and optimization
2. Fleet and activity tracking
3. Digital invoicing and payment systems
4. Vehicle technologies
5. Self-service web portals

Next steps in digital transformation

Level 2 to Level 3 - What's the best way to move forward?

For the organization just starting to get its feet wet in the digital transformation process, and just starting to discover the major benefits it should bring further down the road, it can also be a daunting task to decide where to take the next steps. How do you determine what to prioritize among myriad possibilities? Even with an unlimited budget, it's smart to take the process step by step. Many digital transformation projects fail because the organization simply threw money at the issue and didn't take the time to learn to walk before trying to run.

Our suggestion for moving from Level 2 to Level 3 in your Digital Transformation? A good place to start is investing in cloud-based back-end software or enterprise management software and installing digital route sheets in your collection vehicles.

Cloud-based back-end or enterprise management solution

Enterprise Management is an integrated, cloud-based and scalable solution that gives you a 360-degree view of the business, covering all imaginable lines of business and waste management processes and allowing you to streamline operations, reduce costs, increase productivity and drive profitability. AMCS' digital platform provides an extensive range of solutions for everything from customer and contract management and weighing systems, to asset management, payroll, billing, and recycling and materials trading. Gather, integrate and process multi-layered data to provide seamless service and optimize processes.

Digital route sheets for collection vehicles

The digitization of route sheets for drivers, as well as the use of handheld or on-board devices to record service details, enables a completely paperless process and it reduces the possibility of errors and duplications. Automating the route process also means that information can be made available to customer service, finance or the customer in real time.

Level 3 - 40-60% Maturity

The digital solutions used most often

1. Tablets (in vehicles)
2. GPS monitoring
3. ERP system or best of breed back-office software
4. On-board computers
5. On-board weighing

The operational challenges on the most horizons

1. Digitizing business processes (automation)
2. Harmonizing and optimizing business processes
3. Managing business growth and complexity
4. Creating a culture that embraces change
5. Route management and optimization

The management priorities on most agendas

1. Increasing productivity and efficiency
2. Customer satisfaction and loyalty
3. Improving sustainability
4. Digital transformation (digitizing current processes)
5. Cost reduction

The technological innovations on most 5-year plans

1. Route management and optimization
2. Self-service web portals
3. Business intelligence/analytics
4. Fleet and activity tracking
5. Vehicle technologies

Next steps in digital transformation

Level 3 to Level 4 - What's the best way to start taking real advantage of digital transformation benefits?

When the organization has taken its first steps toward a digital transformation and certain operational processes are working more smoothly and efficiently, the next question is where to start generating the biggest benefits from digitalization. What can you do that will have the greatest impact on profitability and efficiency?

Our suggestion for moving from Level 3 to Level 4 in your Digital Transformation? Look into implementing route management and optimization and adding vehicle technology to start measuring the profitability of your collection routes. And if you haven't done so already, now is a good time to add digital invoicing into the mix.

Route management and optimization

Route optimization can not only offer significant cost reductions, but it also helps to improve customer service by adding reliability and flexibility to collection routes and waste transport. It is also a smart way to help your organization excel in a highly competitive market. AMCS Intelligent Optimization solution offers master route optimization all the way down to real-time driver optimization. It can handle daily dynamic route optimization for ad hoc orders, real-time route optimization on the fly, and automated master route maintenance for churn management, as well as providing black box services for integration into any ERP system to support price optimization, resource management and much more.

Vehicle technology

Vehicle technology has come a long way in recent years and can now bring you fully calibrated, real-time bin management with integrated GPRS, GPS and Wi-Fi. AMCS Vehicle Data Hub is a single hardware box that collects a wide variety of data and can read RFID, I/O signals and CAN-bus. On-board weighing and bin identification help control costs and increase profitability by giving you the capability of identifying and weighing waste and recycling containers during collection. Built-in modems can transfer data directly to the office, and the integrated stop listing feature allows you to block collection of unpaid or overweight containers.

Digital invoicing

A digital billing and invoicing engine can improve both the speed and the accuracy of your billing process, generating a positive effect on cash flow. Use it to facilitate digital invoices, or e-billing, and to automate payment reminders as well as accounts payable processes.

Level 4 - 60-80% Maturity

The digital solutions used most often

1. ERP system or best of breed back-office software
2. GPS monitoring
3. Tablets (in vehicles)
4. Digital invoicing and payments
5. On-board computers

The operational challenges on the most horizons

1. Digitizing business processes (automation)
2. Managing business growth and complexity
3. Harmonizing and optimizing business processes
4. Creating a culture that embraces change
5. Paperless office

The management priorities on most agendas

1. Customer satisfaction and loyalty
2. Increasing productivity and efficiency
3. Cost reduction
4. Digital transformation (digitizing current processes)
5. Improving sustainability

The technological innovations on most 5-year plans

1. Self-service web portals
2. Paperless office
3. Fleet and activity tracking
4. Digital invoicing and payment systems
5. Business intelligence/analytics

Next steps in digital transformation

Level 4 to Level 5 - What's the best way to take your digital transformation to the next level?

When your organization has already reached a significant level of digital transformation and experienced the powerful impact that implementing specific digital solutions has on the business, how do you take your digital transformation process to the next level? The most important next step at this stage of the digital transformation is to give your organization a sizeable competitive (or efficiency) advantage over most other waste management organizations.

Our suggestion for moving from Level 4 to Level 5 in your Digital Transformation? Start using guided navigation for municipal waste collection route guidance and add digital payments to your software solutions.

Guided navigation

Part of AMCS' Mobile Workforce solutions, guided navigation uses a revolutionary on-board computer and in-cab tablet to provide an intelligent turn-by-turn guide for drivers. The Mobile Workforce solution also handles daily safety checks and driver events, at-a-glance lists and map views of routes and work orders, viewable customer details and signature capture. It also supports geocoding. The paperless workflow and back-office integration reduce errors, helping to eliminate revenue leakage in collection operations.

Digital payments

Digital payment offers waste & recycling operators feature-rich payment services that broaden their ability to compete in a rapidly evolving marketplace. The services include card payments (eCommerce & card present), mobile payments, transaction services, and many alternative payment methods. AMCS payment services are pre-integrated with the AMCS Platform and supported by recognized industry partners such as Global Payments and Wells Fargo Bank. Designed to work 'out of the box', the payment services enable proactive payment capture through multiple channels, reducing barriers to the customer payment experience and opening new automated payment streams to the operator.

Level 5 - 80-100% Maturity

The digital solutions used most often

1. ERP system or best of breed back-office software
2. Tablets (in vehicles)
3. GPS monitoring
4. Customer self-service web portals
5. Business intelligence/analytics

The operational challenges on the most horizons

1. Internet of Things
2. Managing business growth and complexity
3. Analyzing business performance, revenue assurance
4. Harmonizing and optimizing business processes
5. Legal compliance

The management priorities on most agendas

1. Improving sustainability
2. Increasing productivity and efficiency
3. Customer satisfaction and loyalty
4. Increasing social responsibility
5. Cost reduction

The technological innovations on most 5-year plans

1. Business intelligence/analytics
2. Vehicle technology
3. Route management and optimisation
4. Self-service web portals
5. Supply chain optimization

Level 5 - What can the truly digital organization do to stay at the top of their game?

Once your organization has gone truly digital, what do you do next to stay on top? After most of the operational processes have been digitalized and made more efficient and error-free, the next step to continue setting yourself apart from the competition is to get truly innovative.

Our suggestion to keep moving forward in Level 5 of your Digital Transformation? Get on board with a full digital presence using some of the latest technological innovations: add chat bots to your self-service automation and auction platforms to your automated subcontractor management system, for example.

Self-service automation with chat bots

Customer Self-Service takes the pressure off your customer service department by automating the most common interactions, such as taking orders, dealing with complaints and answering general inquiries. The system allows operators to configure automated responses to the most common questions from account balance and scheduling inquiries to repeat orders. The chat bot component can interface with third-party platforms such as Facebook Messenger or Amazon Alexa.

Automated query resolution with Interactive Voice Response (IVR)

While traditional IVR is great at routing calls within your call center, next-generation systems allow customers to resolve their own queries through IVR interaction. This includes being able to report missed collections, request additional services and make payments. This type of automation means that problems are quickly and fully resolved without ever getting into your call center, resulting in greater customer satisfaction at a lower cost.

Subcontractor management with auction platform

One of the tools in AMCS' out-of-the-box Digital Engagement solution is the ability to manage the assignment of subcontractor jobs through an online auction platform. Unassigned jobs can be sent directly from the Enterprise Management solution to the auction, where approved trading partners can be invited to participate. Bids are received in real-time and the job details are shared automatically with the winning bidder. With the auction platform, companies in the brokerage business can save up to 60% of the time it normally takes to process jobs.

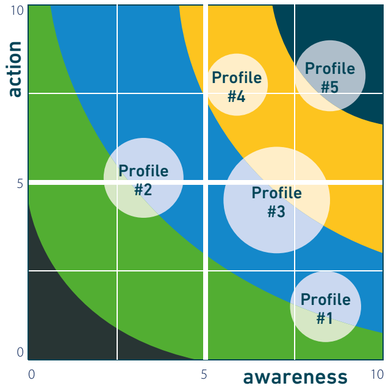
05

Five digital transformation profiles

Many of the organizations participating in our Digital Transformation Barometer experience the same challenges in their evolution toward full digital transformation. Based on their answers to our survey, we were able to define several characteristic profiles that reveal where some of the biggest challenges are and, hopefully, how to overcome them.

Each of the following profile definitions is derived from the organizations in our survey that gave similar answers to the various questions about their levels of awareness and action on the five drivers of a successful digital transformation.

Digital Majurity Profiles



Digital Profile #1 - Just getting started

With an average maturity level of just 22%, this group is not yet out of the gate when it comes to their digital transformation process. They are highly aware of the importance of the five drivers in the Digital Transformation Model, but they score extremely low in actual progress.

8.8
Awareness

2.5
Action

22%
Maturity

Maturity level 2

- Leadership and culture
- New technologies

These 'starters' in the digital transformation evolution are most often quite large private sector companies with large fleets of vehicles and high revenues per employee. They are aware they have a lot of challenges ahead, but with healthy revenues per vehicle and per employee, they have little urgency for digital innovation. However, more organizations in this group than in any of the other groups have plans to increase their spending on digital transformation (in % of revenue) in the coming years to help them catch up.

IT investment before vehicles — 59% agree

Planning an IT budget increase — 88%

What they do

Activities

- household collections (65%)
- commercial/industrial collection (61%)
- recycling (61%)

Digital solutions used

- GPS monitoring (61%)
- tablets (59%)
- ERP (57%)
- on-board computers (51%)

Characteristics

Avg. employees – 1,478
Avg. fleet – 223
Avg. households served – 93,167
Avg. businesses served – 4,706
Avg. waste in tons – 579.553
Avg. recycling in tonnes – 247,647
Government 35% vs. private sector 65%

Challenges for management

Priorities

- productivity/efficiency (78%)
- customer satisfaction (73%)
- sustainability (61%)
- digital transformation (57%)

Challenges

- digitalizing processes (57%)
- harmonizing processes (49%)
- creating a change culture (35%)

Innovations

- route optimization (57%),
- self-service web portals (45%),
- fleet tracking (41%),
- business analytics/margin optimization (41%)

14%
of the respondents

Digital Profile #2 - Not there, don't care

This group of respondents could be described as the 'don't care, doing just fine' category of organizations. Like the group in the first profile, they are not very advanced when it comes to the digital transformation model. The difference here, however, is that the low level of success stems mainly from the fact that they place very little importance on the five organizational drivers.

4.6
Awareness

6.2
Action

29%
Maturity

Maturity level 2

Leadership and culture

New technologies

This group of mostly large companies that serve commercial clients with relatively small fleets of vehicles are indifferent when it comes to the organizational drivers of digital transformation. They generally have low overhead and they are relatively efficient in terms of waste per vehicle/employee. Revenue per employee and vehicle, however, lags others in the survey. And although more than half say that they do intend to increase their spending for digital innovations, only 42% of the respondents in this group agree they should be investing in technology before new vehicles.

IT investment before vehicles

42% agree

Planning an IT budget increase

62%

What they do

Activities

- business/industrial collection (62%)
- household collections (58%)
- construction/demolition collection (54%)

Digital solutions used

- tablets (50%), ERP (46%)
- GPS monitoring (46%)
- electronic invoicing/payments (35%)

Characteristics

Avg. employees – 1,105
Avg. fleet – 56
Avg. households served – 197,718
Avg. businesses served – 1,452
Avg. waste in tons – 142,097
Avg. recycling in tonnes – 76,770
Government 46% vs. private sector 54%

Challenges for management

Priorities

- customer satisfaction (77%)
- productivity/efficiency (62%)
- sustainability (46%)
- digital transformation (46%)

Challenges

- digitalizing processes (46%)
- managing business growth/complexity (35%)
- creating a change culture (35%)

Innovations

- route optimization (54%)
- fleet tracking (46%)
- vehicle technology (42%)
- paperless office (42%)

21%
of the respondents

Not sure what Digital Transformation can mean for your organization? There are easy ways to find out.

There are plenty of reasons why an organization might not yet be convinced of the benefits that a digital transformation can bring to the way they operate their business. For some, it's like not seeing the forest for the trees. There are so many options, where do you start? For others, it might be a question of not wasting the time and money to fix something they don't think is broken. This is how they've always done it and it's worked just fine until now. Whatever the reason, not implementing some form of digitalization is missing out on a real opportunity to significantly improve the business processes.

Granted, digital transformation is an evolution, a process and, yes, also an investment. But there are also ways to experience some of the advantages before you commit to a major transformation project. Here are some of our suggestions for testing the water, so to speak:

1 EASY - Route Sheet Sampling

Using sample data from an organization's current route sheets, we can import your routes into the AMCS optimization system to show you where the biggest potential is for savings and efficiency. In a recent data sample, the client's 17 routes were reduced to 13, saving them use of an entire vehicle.

2 EVEN EASIER – Simple API for Routing Web Services

This solution is so easy it doesn't even require any planning software. It's possible to optimize the sequence of your route with one click of the mouse. This option allows you to send us your daily routes and the AMCS software then optimizes them and sets them in the most efficient order for you.

What's the best way to find out what a digital transformation can bring to your organization? One way to discover the quick wins that apply to your own organization is during a Best Practice Process Workshop. During the workshop, we set an organization's (ideal) processes side by side to a wealth of digital best practices in the waste management industry. The result is a clear overview of where improvements could be made, how they might be implemented and what benefits they would deliver.

Digital Profile #3 - Working on it

The largest group in our survey is also statistically the most average when it comes to the maturity level of their digital transformation. Their 44% maturity level is the result of a high level of awareness (7.8) that is hampered by a failing grade in progress on action (5.6) on the five drivers of the Digital Transformation Model.

7.8
Awareness

5.6
Action

44%
Maturity

Maturity level 2

+ Employee engagement

– Value chain, partners and trends

This group in the middle may be convinced of the importance of digital transformation, but the implementation of the five drivers of a successful transformation leaves a lot to be desired. Most are smaller companies or municipalities. They serve large numbers of households per vehicle, but they also need a relatively large number of employees to do so. Their revenue per vehicle is above average while revenue per employee is below average.

IT investment before vehicles — **51% agree**

Planning an IT budget increase — **69%**

What they do

Activities

- household collections (50%)
- industrial/commercial collection (50%)
- hazardous waste collection (50%)

Digital solutions used

- GPS monitoring (67%)
- tablets (58%)
- customer web portals (50%)
- digital invoicing/payments (50%)

Characteristics

Avg. employees – 275
Avg. fleet – 86
Avg. households served – 488,256
Avg. businesses served – 1,907
Avg. waste in tonnes – 245,187
Avg. recycling in tons – 85,736
Government 51% vs. private sector 49%

Challenges for management

Priorities

- customer satisfaction (83%)
- cost reduction (67%)
- productivity/efficiency (58%)
- employee satisfaction (58%)

Challenges

- managing business growth/ complexity (42%)
- harmonizing processes (25%)
- digitalizing processes (25%)

Innovations

- self-service web portals (42%)
- vehicle technology (33%)
- paperless office (25%)
- digital invoicing/payments (25%)

41%
of the respondents

Digital Profile #4 - Accidental experts

The smallest group in the survey ranks the five drivers of successful digital transformation as having only slightly higher than average importance for their business. Yet, despite the low priority, they indicate that they have already made extraordinary advancements in their implementation.

6.6
Awareness

8.8
Action

58%
Maturity

Maturity level 3

+ Leadership and culture

– New technologies

As if nearly by accident, this small group of respondents has managed to take significant action to implement most or all operational drivers of the digital transformation model. These are mostly small companies with very small fleets of vehicles. Despite having made impressive progress in implementing the critical operational drivers of a digital transformation, they score surprisingly low when compared to other groups on efficiency factors such as revenues and customers per vehicle. Revenues per employee, on the other hand, are slightly higher than average, and they expect higher than average growth in the next three to five years.

IT investment before vehicles — **8% agree**

Planning an IT budget increase — **17%**

What they do

Activities

- household collections (78%)
- industrial/commercial collection (50%)
- hazardous waste collection (50%)

Digital solutions used

- ERP (72%)
- GPS monitoring (72%)
- tablets (67%)
- automated invoicing (56%)

Characteristics

Avg. employees – 273
Avg. fleet – 72
Avg. households served – 103,750
Avg. businesses served – 834
Avg. waste in tons – 364,125
Avg. recycling in tonnes – 77,084
Government 42% vs. private sector 58%

Challenges for management

Priorities

- customer satisfaction (89%)
- productivity/efficiency (78%)
- cost reduction (56%)
- sustainability (50%)

Challenges

- digitalizing processes (44%)
- managing business growth/ complexity (28%)
- harmonizing processes (28%)

Innovations

- self-service web portals (67%)
- business analytics/margin optimization (56%)
- route optimization (44%)
- paperless office (44%)

10%
of the respondents

Digital Profile #5 - Best in Class

A relatively small group of the organizations we surveyed rank in the highest levels of maturity. These organizations have a solid understanding of the importance of digital innovation and digital transformation, and they have made good on that awareness by achieving very high levels of progress on the actions needed for success. These organizations represent the best in class when it comes to digital transformation in the waste management industry.

9.4
Awareness

8.8
Action

88%
Maturity

Maturity level 5

Leadership and culture

Business intelligence/ data science

A full 100% of the respondents in this group have already implemented many of the most useful digital solutions, such as ERP, web portals, GPS monitoring, in-cab tablets and business analytics, to improve the efficiency of their operations. They also perform more waste management activities on average compared to the other groups. These mostly larger companies and municipalities with larger fleets of vehicles reported higher than average levels of efficiency, especially in terms of vehicles per employee and per vehicle.

IT investment before vehicles — **67% agree**

Planning an IT budget increase — **56%**

What they do

Activities

- industrial/commercial collection (76%)
- construction/demolition collection (59%)
- household collections (53%)

Digital solutions used

- tablets (59%)
- ERP (53%)
- business analytics/margin optimization (35%)
- on-board weighing (29%)

Characteristics

Avg. employees – 925
Avg. fleet – 144
Avg. households served – 130,500
Avg. businesses served – 1,681
Avg. waste in tonnes – 984,695
Avg. recycling in tons – 315,334
Government 50% vs. private sector 50%

Challenges for management

Priorities

- productivity/efficiency (71%)
- strategic IT-architecture (71%)
- digital transformation (65%)
- cost reduction (59%)

Challenges

- digitalizing processes (71%)
- harmonizing processes (65%)
- route optimization (47%)

Innovations

- route optimization (76%)
- self-service web portals (76%)
- business analytics/margin optimization (76%)
- fleet tracking (59%)

15%
of the respondents

06

A closer look at the best in class

What sets the most advanced digital waste management organizations apart from the rest? What do they do that puts them in the lead? In this chapter, we examine those organizations in our survey that rank at the top of the digital transformation maturity class.

The respondents in our survey that rank in Maturity Level 5 are the most advanced in terms of both awareness and action in implementing the five operational drivers of the Digital Transformation Model.

How important is digital innovation?

Nearly all of the most advanced organizations in our survey consider digital innovation to be either important (33%) or very important (61%), compared to only 78% of the rest of respondents.

For our Best in Class participants, the larger the fleet size, the greater the need for efficiency and optimization. The same tends to occur as revenues and budgets grow. This growth creates a greater sense of urgency for digital transformation.

"Digital innovation is (very) important to our success"

94% agree

What do they spend on IT?

The Best in Class spend more of the organization's available revenues and budgets on IT than the rest of the organizations we surveyed. The average IT spend in 2017 was 1.76% of revenues compared to 1.55% spent by the rest. More than a third of the Best in Class spent more than 2% of their revenues and budgets on IT. A mere 17% of the rest of our respondents spent such a high percentage. (Average spending in IT in our survey was 1.63% of total revenue/budget.)

"We spent more than 2% of revenues on IT in 2017"

35% agree

Interestingly, the differences in spending across geographic locations are quite large. The highest percentages came from respondents in Continental Europe, with the Nordics not far behind. The most advanced organizations in North America and the UK & Ireland had considerably lower spending (averaging 0.8% and 0.6%, respectively).

Only 56% of the Best in Class planned to increase the percentage of revenues and budgets spent on IT in the coming years. This is fewer organizations than the rest, where 64% said they planned an increase. There can be several explanations for the lack of increase, including a lesser need than those organizations that are further behind in their digital transformation. Among the other reasons given by participants for not increasing their spending are, for example, a decision to base IT investments on need and ROI, or a situation where revenue growth is extremely rapid.

What is more important: more IT or more vehicles?

The most digitally advanced organizations in our survey are more often in agreement with the idea that companies would be better off investing more in IT than buying new vehicles: 67% among Best in Class vs. 45% of the rest. Those companies that understand the importance of digital innovation and have already invested in business intelligence and data science tend to agree the most with this statement. They have already seen the power of analytics to improve their business.

Unsurprisingly, those in our survey who said they planned to increase their IT spending were also more likely to agree that investment in IT is preferable to investment in new vehicles. The most common reasons given for agreeing were that spending on IT would optimize the usage and planning of resources and routes so that more revenues can be generated with fewer vehicles.

"Companies are better off increasing their IT investment"

67% agree

07 About the research

Our Digital Transformation Barometer 2018 survey asked decision makers in the waste management industry to rank their organizations on the success of their digital innovations. The result is a gauge of the level of progress on the digital transformation process in the waste management industry.

The survey was conducted from March to September of 2018. Both private and public sector organizations were included in the survey. The decision-makers in several geographical areas who were invited to fill out our online survey questions included company owners, presidents and managing directors, CEOs, IT managers/CIOs, operations managers/COOs, logistics managers and heads of transport, directors of public works or solid waste, waste managers, and purchasing/procurement managers.

Who responded to our survey?

The respondents to our survey were split nearly evenly between the private sector and municipal services. A small percentage (14%) of those answering our survey questions are brokers who coordinate the outsourcing of waste management activities and other specialized organizations.

One quarter of the participants represent a consortium of neighboring municipalities working together to take advantage of economies of scale, which is common in Europe. Interestingly, when municipalities cooperate, the number of different waste management activities they perform is 39% higher than what municipalities do individually.

Type of organization

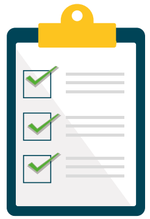
39%
private sector waste collector

municipal service

municipal service consortium

brokers & other

Most common positions held



19%
COO/Operations Manager

CEO / president / general director

CIO / IT manager

public works director

company owner

Size of the organizations

The answers to our survey show that there is a very large size variation for waste management organizations in numbers of employees. While over 70% of respondents have fewer than 250 employees, nearly 7% indicated that they have more than 5,000, and a little more than 19% have fewer than 25 employees. The average number of employees is just over 700. Looking specifically at the private sector, the average is somewhat lower at 640. The average for municipal services is 782.

The average fleet size in our survey is in the neighborhood of 100 vehicles. But here again, the differences between individual organizations are quite large. Nearly half of the organizations have fewer than 25 vehicles. The majority of those with more than 25 vehicles have between 50 and 250 vehicles. Private sector companies tend to have slightly more vehicles (avg. 120) than the municipal services (avg. 89).

Number of employees

73%

small/medium enterprise (<250)

large enterprise (250-2500)

very large enterprise (2500+)

Fleet size

48%

25 vehicles or less

between 25 and 50 vehicles

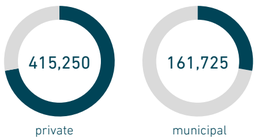
between 50 and 250 vehicles

more than 250 vehicles

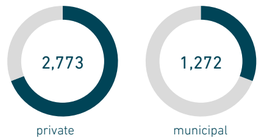
Waste collection volumes

The private sector respondents in our survey tended to indicate significantly larger numbers of households and/or businesses served and tons of waste collected.

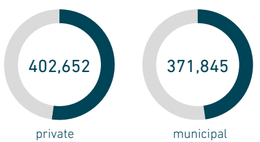
Waste collected - private sector & municipal



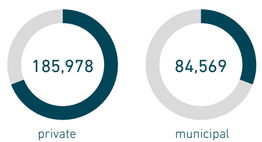
households served



businesses served



tons of waste collected annually



tons of recycling collected annually

Geographical locations

For our Digital Transformation Barometer 2018, we surveyed waste management and recycling organizations across five different geographical regions: Australia, Continental Europe, Scandinavia, North America and the UK & Ireland. Below are a few of the insights on efficiency based on geography.

Geographical statistics

Most customers served per vehicle:
Scandinavia

Most waste collected per vehicle and per employee:
UK & Ireland

Most digital solutions in use:
Scandinavia

Most interest in digital innovation:
North America

Most agreement with IT investment over vehicles:
Australia & New Zealand

Most budget spent on IT:
Scandinavia

Most overall efficiency:
Continental Europe

The waste management barometer 2018 per geographical location:

Europe

North America

Rest of World

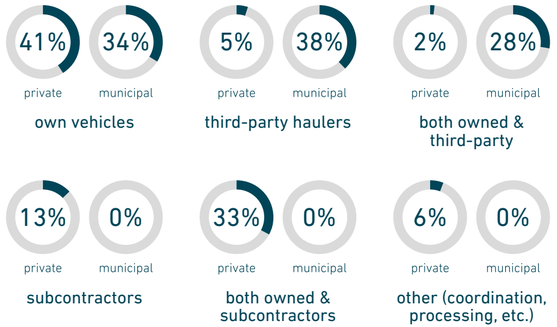
Types of waste management activities

The results of our survey reveal a clear difference in both the type and the method of waste collection between government services and private sector companies. Unsurprisingly, the majority by far of municipal services (88%) provide household waste collection. Only 39% of the private sector companies surveyed provide household collections. On average, respondents perform approximately 4 individual waste management activities, with no significant differences appearing between municipal and private sector organizations.

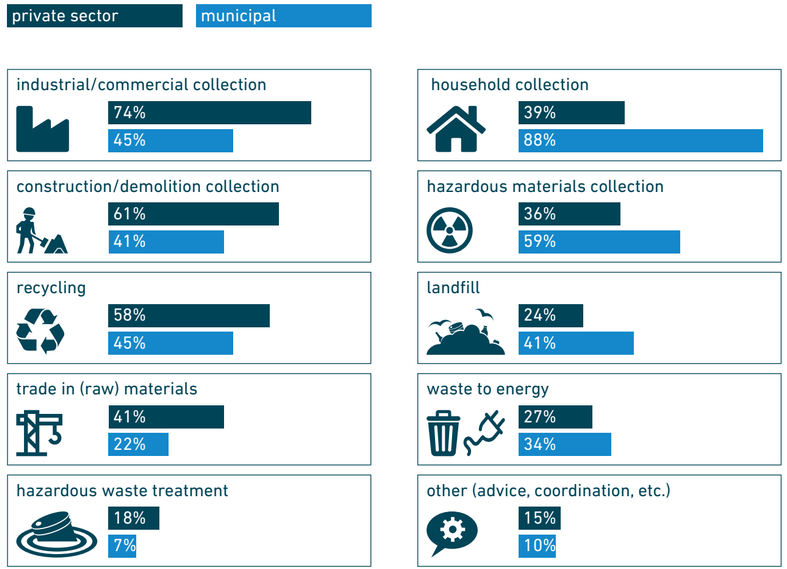
Municipal services are more than twice as likely (226%) to collect household waste than private sector companies, and more than one-and-a-half times more likely to operate landfills and collect hazardous waste (171% and 164%, respectively). Private sector companies are, on average, twice as likely to perform hazardous waste treatment (256%) and trade in raw materials (185%).

In collection activities, private sector companies apply a wide range of business methodologies, from capital expenditures for vehicles to subcontracting and using third-party haulers. Municipal services, on the other hand, while they do often hire third-party haulers, do not subcontract their activities.

Method of waste collection – private sector VS municipal



Waste activities & services – private sector vs. municipal



We are AMCS

“Digital ways to a cleaner world”

We are AMCS. Creators of the AMCS Platform: an enterprise grade cloud and software platform that is designed based on the best practice processes of thousands of waste & recycling companies across the globe. Our platform is inspired by global market trends, driving automations and delivering end-to-end standardization and optimization of all your business processes. A platform that enables established waste & recycling companies to operate smarter, more seamlessly and more digitally.

Supported by:

ISWA
International Solid Waste Association

Progress

AMCS