Forbes insights

Discover the world’s most valuable commodity
THE EMPTY SPACE ECONOMY: DISCOVER THE WORLD'S MOST VALUABLE COMMODITY
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EXECUTIVE SUMMARY

Billions of dollars are being squandered when goods travel from manufacturers to our homes. Shipping containers sailing across the oceans from Asia are 24% empty, according to research from DS Smith. This means that every year some 61 million TEU containers are shipped unnecessarily, costing tens of billions of dollars and emitting approximately 122 million tonnes of carbon dioxide into the atmosphere. That waste is further compounded once products make it to the shore and are sent from distribution centers to customers’ doors in e-com packaging. The recipients are often taken aback by the empty space in the packaging.

Executives estimate that the amount of empty space in shipping containers is even greater, according to a global survey by Forbes Insights and DS Smith. Despite the clear benefits of empty space reduction, such as cost savings and reducing the environmental impact, it does not seem to be a high priority on executives’ agendas. Thus, they are, in effect, forgoing a 24% reduction in their shipping costs.

The following report presents research by DS Smith and Forbes Insights, which quantifies the amount of empty space and its results—the foundations of what we call the Empty Space Economy. It is our hope that it will prompt a deeper look into this issue and result in helping businesses to prosper and reducing the environmental impact at the same time.

KEY FINDINGS

EMPTY SPACE: THE SIZE OF THE PROBLEM

INBOUND: At least a quarter or more of what is shipped across the oceans in containers from the manufacturers is empty space, according to 69% of executives surveyed by Forbes Insights and DS Smith. In separate research, DS Smith calculated that the average empty space in shipping containers across seven different categories of products amounts to 24%. If the 24% is representative of other categories, the number of shipping containers could be decreased by 61 million globally every year if the empty space were eliminated.

E-COMMERCE: Compounding the empty space issue is e-commerce, as 60% of executives surveyed by Forbes Insights and DS Smith believe that more than a quarter of what they send out in e-com packaging is empty space. DS Smith research across seven product categories revealed that on average, empty space ranged from 18% for clothing and footwear to 64% for glassware.

SUSTAINABILITY: MORE FOCUS ON EMPTY SPACE NEEDED

Eighty-one percent of executives are concerned about environmental issues, and 72% believe that reducing empty space would...
reduce environmental impact. This is crucial, considering that every year some 122 million tonnes of carbon dioxide is emitted by shipping empty space in containers from manufacturers to the receiving ports. At present, while 93% of executives have taken action to reduce the environmental impact of packaging, only 36% have conducted audits of empty space in shipping goods.

CUSTOMER EXPERIENCE: UNTAPPED POTENTIAL OF PACKAGING

While 71% of executives believe that customers are concerned about the environmental impact of packaging, many executives do not make a connection between the impact of packaging and customer experience. Fifty-two percent state that packaging is not a factor in customer experience.

THE BUSINESS CASE: SAVINGS FROM EMPTY SPACE REDUCTION

Sixty-five percent of executives surveyed by Forbes Insights and DS Smith believe they can achieve a packaging cost reduction of at least 25%, and 62% believe that they can achieve such savings in their logistics costs. Based on its proprietary research, DS Smith estimates that this translates to $46 billion globally a year in potential savings. This amount accounts for potential savings in logistics costs, but it does not include further savings in material reduction or storage and handling costs, for instance.

LOOKING AHEAD: MORE INTEREST IN PACKAGING

In the next few years, we need to see increased interest in empty space and actions to reduce it. Supply chain and logistics executives are convinced that reducing empty space in packaging will lead to cost savings and reducing environmental impact (at 73% and 72%, respectively). The challenge now is to increase the awareness of top executives about empty space. They are the ones who would sponsor such initiatives across their business divisions, yet at this stage just 39% think their executives are aware of the empty space issue; thus, executives miss the opportunity to gain savings that could be used for sustainable and smart packaging initiatives in the future.

METHODOLOGY

DS SMITH RESEARCH

INBOUND: The DS Smith study looked at the volume of containers for seven categories, which represent 5.7% of global trade. Based on their experience over the last eight years, when the team worked with various manufacturers and retailers to remove empty space from the supply chain, DS Smith estimated a 24% potential saving in empty space across the categories, which equates to potentially 3.5 million containers saved every year. Assuming that the 24% in empty space is representative of the other categories, nearly 61 million containers could be saved globally every year. (For more information, please see Appendix 1.)

E-COMMERCE: The DS Smith team analyzed 190 e-com deliveries received from 44 retailers, including e-tailers, brick-and-mortar retailers and brand manufacturers, across five different countries. The team ordered 498 products across seven defined categories and measured the empty space in every e-com package received, as well as other customer experience elements such as ease to open the pack, time taken to unpack and recyclability. (For more information, please see Appendix 1.)

FORBES INSIGHTS AND DS SMITH RESEARCH

Forbes Insights surveyed 370 executives from Europe (34%), Asia Pacific (30%), North America (29%) and Latin America (7%). Seventy-five percent of their companies had annual revenue of at least $500 million. Forty-two percent of
executives were at the C-level, including 23% who were CEOs. Half of the executives came from operations, followed by purchasing (22%) and logistics (18%). The biggest group (51%) represented traditional retailers with e-commerce, 33% were from e-commerce and 11% from logistics companies. The survey covered all major products categories. Additionally, Forbes Insights conducted interviews with five highly experienced executives who are actively pursuing improvements in packaging and empty space reduction.

EMPTY SPACE: THE SIZE OF THE PROBLEM

The amount of empty space is a significant issue in inbound shipping and e-commerce deliveries (see Figures 1 and 2 below). DS Smith found evidence that 24% of what is shipped from suppliers is empty space. According to 69% of executives surveyed by Forbes Insights and DS Smith, 25% or more of what they ship is empty space, which is even higher than the estimate from DS Smith.

This waste happens because businesses have not found the right balance between eliminating empty space from their cartons and having the right size for an optimum container fill at the same time. For instance, a limited number of standard carton sizes makes a significant “contribution” to adding empty space in the supply chain. While the cartons may fit the containers, and fill a pallet footprint, companies are still shipping air inside the cartons.

Executives thus peg the amount of empty space transported in containers as higher than estimates by DS Smith. However, it needs to be noted that 79% of executives surveyed by Forbes Insights and DS Smith were confident about their estimates, which means that the number of unnecessarily shipped containers may significantly exceed 61 million containers, up to 175 million containers a year.

After arriving in the destination country, the cargo ends up in warehouses and distribution centers. Twelve percent of the products are sold via e-commerce, and this is expected to grow to 17.5% by 2021. When these products are sent out by e-commerce, they are removed from their inbound transit cartons and packed into e-com packaging. Their e-commerce journey starts from the distribution centers, and the packages are

2 Statista 2018.
delivered in many different directions to customers’ houses, or to collection locations, adding many more trips than simply sending products to stores for traditional shopping.

Each e-com packaging delivery is carrying some empty space, with 60% being more than a quarter empty. There is more potential for compounding empty space when ordering individual products, which arrive in separate e-com packaging. This empty space is most often filled with air pillows, paper filler or polystyrene, according to the Forbes Insights and DS Smith survey.

The product primary pack may also be oversized, which has an impact throughout the supply chain. During its research DS Smith redesigned several toy packages. Not only did it reduce the cube size, by up to 33%, but it also reduced the dimensions of the e-com packaging required, decreased its weight, and eliminated polystyrene and twisty ties.

Returns are also a compounding factor. As much as a third of all items bought online are returned, which means that many packages are traveling back and forth. According to the DS Smith study, 94% of e-com packages received could be reused to return the product, meaning that the same amount of empty space would travel back with the product. That is very likely to happen, since for customers returns are often free. For example, 96% of the clothing and footwear category products analyzed by DS Smith could be returned for free, allowing online shoppers to order the same item in different sizes and return those not wanted.

SUSTAINABILITY: MORE FOCUS ON EMPTY SPACE NEEDED

Sustainability is one of the top global issues, and it is also a big part of CSR (corporate social responsibility) programs. Sustainable packaging is part of such efforts. Ninety-three percent of surveyed executives say their companies have done something to tackle environmental issues in the packaging of their products.

McCormick & Co. intends to reduce the carbon footprint of its packaging by 25% by 2025. Unilever, which purchases 2 million tonnes of packaging a year, believes that it is more urgent than ever to be efficient with packaging and find solutions to deal with “post-consumer” waste.

The focus of such programs is often to create a circular economy in which packaging is reduced, reused and recycled. The Empty Space Economy—reducing the empty space in packaging—can also significantly contribute to a decrease in greenhouse gas emissions. Every year at least 122 million tonnes of carbon dioxide is emitted by shipping empty space in
containers from manufacturers to the receiving ports. That is roughly equivalent to the annual CO₂ emissions of the country of Belgium, Pakistan or Argentina. And this does not include the CO₂ emissions generated while transporting the products from the ports to distribution centers, and then to final customers.

Eighty-one percent of executives surveyed by Forbes Insights and DS Smith are concerned about environmental issues, such as deforestation, waste, pollution or greenhouse gas emissions. And 72% believe that reducing empty space would reduce their environmental impact.

One retailer acting on this is Metro AG. The multinational German retailer has long focused on supply chain optimization, says Veronika Pountcheva, global director of corporate responsibility. “It’s part of the brand to make sure that by design the products or the packaging are recyclable—and that we have optimized volume and size to avoid waste and inefficiencies in transporting.”

But not enough retailers are following in the footsteps of Metro AG, as substantially fewer companies are taking actions to reduce the environmental impact of their packaging than claim to be concerned about sustainability. Forty-four percent include packaging within sustainability goals, and 36% audit empty space in shipping goods.

By far the biggest challenge to focusing more on packaging is the cost of changing to more efficient materials and design, which executives see as prohibitive (59%). This is a paradoxical argument considering that better design and using less materials is the key to releasing the cost tied up by the empty space.

**CUSTOMER EXPERIENCE:**
**UNTAPPED POTENTIAL OF PACKAGING**

Customer experience is shaping up as a key competitive differentiator. Already 89% of companies compete based on it. Packaging is part of that customer experience—how the product is packaged influences customer satisfaction, and thus customer acquisition and retention. Everyday shoppers’ concerns are changing, with 51% of consumers considering packaging waste an important environmental issue, and the same percentage agreeing that the sustainability of paper-based packaging is more important to them today than it was five years ago.
Unilever, for example, found in its own survey that a third of consumers choose brands based on their social and environmental impact. For many of these self-directed consumers—especially millennials and the younger generation set to become spenders—the values represented by the brand are increasingly related with the e-com packaging experience, which acts as the visual and tactile expression of a retailer. “We continually look at new ways to reduce, reuse, recycle and recover packaging and waste and are developing innovations that address both the packaging and product that is disposed after use,” says David Blanchard, chief R&D officer at Unilever.

While 71% of executives believe that customers are concerned about the environmental impact of packaging, many executives do not make a connection between the impact of packaging and customer experience. Fifty-two percent state that packaging is not a factor in customer experience. When they do connect packaging to customer experience, it is mostly in terms of brand perception. Only 35% tie it to the amount of empty space.

With the so-called Amazon effect forcing companies to match customers’ expectations created by the giant e-tailer, companies are delivering individual packages to multiple locations and offering free delivery within two days or less. The balancing act is finding space efficiencies without compromising the primary directive—getting the product to the customers’ front door in one piece and on time. Overprotect and you produce waste.

“We have ongoing efforts in place to ship from our vendors the most efficient number of units per carton, saving corrugated packaging,” says Leah Drill, a spokesperson for Bed Bath & Beyond, the U.S.-based retailer of household goods. “The related carton reduction translates into fewer trucks and therefore a reduction in fuel consumption.” The retailer’s “Freight Think/Case Pack” optimization program aims to develop more “right-sized” packaging. It’s also reducing package cube size and using less material to optimize shipping containers.

Its fulfillment centers have adopted biodegradable air pillow solutions to replace paper filler, which cost and weighed more “for each and every package,” Drill says. “We have adopted custom-built corrugated packaging machines that accommodate for irregular commodities that we ship daily. All sites have these machines operating daily on 10% to 15% of the packages we ship.”

Whenever there is empty space in a carton, whether it is received from a supplier or sent to a customer, the amount of material and resources

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**Figure 4. What aspects primarily define the customer experience around your packaging?**

- **49%**: Brand perception: The overall care given to the design of the packaging, use of space, materials, ease of opening and unpacking, and recycling
- **49%**: Brand experience: The display of the product within the packaging, brand communication, customization
- **41%**: The real or perceived environmental impact of the packaging material used
- **38%**: A combination of empty space and packaging material
- **35%**: The amount of empty space in the package

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**Figure 5. Which of these void fills do you use in your e-com packaging?**

- **57%**: Air pillows
- **51%**: Paper filler
- **47%**: Polystyrene
- **4%**: None
used is greater than it needs to be for the product it contains. Unlike these forward-thinking retailers commenting above, the majority of e-commerce businesses seem to be using standard-size cartons, which are often oversized and fill the empty space with different types of material, all of which add to the excessive packaging material used. The surveyed companies often use more than one type of void fill, some of which are not readily recyclable.

Marks & Spencer is developing bespoke packaging at source for the online journey, so products are already ready to go once the order hits the destination warehouse. Roger Wright, the company’s head of technical packaging, also points to machines that make cartons customized to the size of a particular order, almost like 3D printing for web retail. The packaged order can be right sized and simply flows through the production line. “It’s only a matter of time before we move from a limited suite of pre-cut cartons to a bespoke model,” he says. “You can do it with corrugated board, in a slightly different shape than what people are used to. And corrugated paper is one of the greenest materials around.”

Peapod is a great example of innovative thinking around packaging. The U.S.-based online grocer has the advantage of owning the supply chain all the way to the front door, where its drivers connect in person with customers.

“A new shipping tote will help us simplify how we pack orders and expand our reuse of the container 17-fold,” says Sean O’Keefe, vice president of supply chain planning and management at Peapod. “We’re also improving the cubic inches within the shipping container to reduce the number of bags and the number of totes that we need for the average order. We have seen anywhere from 10% to 15% improvement in cubic inches within the tote itself.”

The importance of that moment when a purchase arrives, especially for a pure-play e-commerce retailer whose brand is all about delivery service, cannot be overstated. But these efforts to improve customer experience with more sustainable and right-sized packaging should not take away from efforts to improve the shipping journey that the customer does not see, the leg from manufacturers to distribution centers and retailers. It is the longest part of the journey, producing the most waste and unnecessary costs.

**THE BUSINESS CASE:**
**SAVINGS FROM EMPTY SPACE REDUCTION**

Eliminating empty space can help any business that ships goods gain significant savings and an advantage over its competition while reducing its environmental impact. “The business case is clear,” says Unilever’s Blanchard. “Reducing waste creates efficiencies and lowers costs. Reusing materials extends their life, helping to use less of the earth’s precious resources. Recycling allows us to repurpose valuable materials that would otherwise have been wasted.”

The amount that could be saved annually on a global basis is some $46 billion. And this is based on a conservative estimate of the amount of empty space, derived from research by DS Smith, and not the Forbes Insights and DS Smith
survey results. If executives are right, the opportunity to cut shipping costs is substantially bigger.

How much cost reduction do the leaders in the survey think they can realize by reducing empty space? Sixty-six percent of survey respondents believe that they can achieve savings of at least 25% in packaging costs by eliminating empty space.

When asked about which supply chain factors could give companies an advantage over competitors, packaging efficiency is the top answer (50%). And executives are confident that packaging initiatives will give them a supply chain advantage (75% are “confident” or “very confident”).

Real-world examples prove that packaging is an area ripe for savings. Marks & Spencer’s Wright says the retailer has saved $2.1 million in combined savings in logistics, handling and reduced packaging. Unilever’s “Sustainable Living Brands” products, with a reduced environmental footprint and positive social impact, grew 50% more than the rest of the company’s portfolio and delivered 60% of Unilever’s growth in 2017.

The question for decision makers is how to fund the packaging initiatives that will unlock the savings. Thirty-six percent of executives in the Forbes Insights/DS Smith survey say they will definitely increase their packaging budget, and a third say they will consider it. In all, 68% are at least considering spending money on the opportunity.

However, only 15% recognized that these projects could ultimately be funded by supply chain savings. And the highest number of respondents, 45%, believe that achieving cost reductions in shipping are a competing priority when budgets are decided. An ironic finding considering that, as we have shown, tens of billions of dollars could be saved by reducing empty space. What is needed is for executives to make the connection between shipping costs and empty space. After all, it would be difficult to negotiate a 24% cut with their transporters.

But convincing leadership won’t be easy. Only 39% of respondents feel that executives in their organization are
The appeal of the Empty Space Economy is in the expansive and interconnected benefits that fall neatly into place once you reduce air in packaging. If the primary driver for an organization is to save money by eliminating empty space, it will without question have a positive environmental impact and improve customer satisfaction, whether they are objectives or not. As Figure 8 shows, cost savings and reducing environmental impact are entwined (at 73% and 72%, respectively).

The surveyed business leaders see a future defined by smart packaging that is both traceable and trackable (47%) and new packaging design that reduces empty space (42%). At the center of this virtuous circle is business—sustainability is a goal that rewards responsible brands with significant cost savings. As Pountcheva says, “It’s all connected.”

The good news is that the next 12 months should see increased interest in empty space and actions to reduce it, as executives intend to make sure packaging reflects their values and to seek help with achieving this. Savings from reducing empty space could ultimately help fund innovation projects to create more sustainable and smart packaging.
CONCLUSION

In this report, we have revealed the hidden problem of the Empty Space Economy, based on the data gathered independently by DS Smith and the estimates by executives surveyed by Forbes Insights. Solving this issue would lead to substantial financial savings, improved sustainability and staying true to companies’ values. The data presented in this report points to the following solutions:

• Savings from cutting unnecessary costs due to empty space, which can amount to $46 billion globally, can be used to invest in innovation projects such as smart packaging and logistics initiatives. Budget increases for packaging initiatives, to be undertaken by 67% of companies over the next 12 months, can thus be recouped from such savings.

• Leaders in logistics and packaging, as well as sustainability officers, must introduce top management to the Empty Space Economy. Given the results of the Forbes Insights/DS Smith survey and the DS Smith research, the benefits are potentially significant. However, not enough executives are supporting these initiatives across their business.

• Empty space reduction needs to be connected to customer experience, which is shaping up as a key competitive differentiator. How the product is packaged influences customer satisfaction, and so customer acquisition and retention, and thus improved revenue. This is not yet understood, as only 35% of surveyed executives tie these factors to the amount of empty space.

• The Empty Space Economy must be seen as an integral part of the circular economy of reduce, reuse and recycle. Seventy-two percent of executives believe that reducing empty space would reduce the environmental impact. And yet only 44% include packaging within sustainability goals, and just 36% audit empty space in shipping goods.

ACKNOWLEDGMENTS

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• David Blanchard, Chief R&D Officer, Unilever
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• Sean O’Keefe, Vice President, Supply Chain Management, Peapod
• Veronika Pountcheva, Global Director of Corporate Responsibility, Metro AG
• Roger Wright, Head of Technical Packaging, Marks & Spencer
APPENDIX

AVERAGE INBOUND EMPTY SPACE

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>TOTAL CONTAINERS</th>
<th>SAVING (%)</th>
<th>CONTAINERS SAVED (TEU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparel</td>
<td>$3,265,682</td>
<td>23.4%</td>
<td>763,170</td>
</tr>
<tr>
<td>DIY</td>
<td>$5,227,279</td>
<td>34.8%</td>
<td>1,819,093</td>
</tr>
<tr>
<td>Footwear</td>
<td>$2,207,381</td>
<td>19.7%</td>
<td>434,854</td>
</tr>
<tr>
<td>Home</td>
<td>$1,738,100</td>
<td>10.2%</td>
<td>177,286</td>
</tr>
<tr>
<td>Home Textiles</td>
<td>$445,989</td>
<td>23.4%</td>
<td>104,362</td>
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<tr>
<td>SDA</td>
<td>$773,167</td>
<td>7.1%</td>
<td>54,972</td>
</tr>
<tr>
<td>Toys</td>
<td>$902,895</td>
<td>11.0%</td>
<td>99,318</td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td></td>
<td>14,560,494 TEU CONTAINERS</td>
</tr>
<tr>
<td>Savings</td>
<td></td>
<td></td>
<td>3,454,055 TEU CONTAINERS</td>
</tr>
</tbody>
</table>

AVERAGE E-COMMERCE EMPTY SPACE

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>NUMBER OF PACKS</th>
<th>% AVERAGE EMPTY SPACE PER PACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing/footwear</td>
<td>43</td>
<td>18%</td>
</tr>
<tr>
<td>Toys</td>
<td>28</td>
<td>52%</td>
</tr>
<tr>
<td>Glassware</td>
<td>26</td>
<td>64%</td>
</tr>
<tr>
<td>Lighting</td>
<td>24</td>
<td>43%</td>
</tr>
<tr>
<td>Kitchen/dining</td>
<td>24</td>
<td>50%</td>
</tr>
<tr>
<td>Small domestic appliances</td>
<td>28</td>
<td>40%</td>
</tr>
<tr>
<td>Groceries</td>
<td>17</td>
<td>51%</td>
</tr>
</tbody>
</table>

Source: DS Smith
ABOUT FORBES INSIGHTS

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