Industry-Specific Operating Systems (#ISOS) will consolidate insular software solutions *and empower a new era of SME businesses.*

The Cusp

The third wave of integrated software *flips the SME-Enterprise power dynamic on its head*

In the early days of software, monoliths covered functions horizontally and required costly human tailoring and integrations only big corporations could afford. Then, out-of-the-box solutions offered horizontal functions to SMEs, and insular offerings specific to industry-function intersections emerged. Today, Industry-Specific Operating Systems (ISOS) are aggregating intersection-specific offerings into integrated solutions for SMEs. Many larger organizations are trying to hold onto their legacy software and infrastructure investments; but now they are competing with SMEs who run their businesses on more advanced – and cheaper – ISOS.

Software Wave 1

First, there were the monoliths. These software behemoths covered one horizontal function across industries. Industry-specific peculiarities were addressed by tailor-made solutions, sold by traditional salesforces and modified by in-house developer teams, consultants or integrators to meet individual customer needs. Across business functions these monoliths were integrated in the same manual, labor intensive way leading to a complex and often inflexible system landscape. Abstracted to a high level, the situation looked like this:
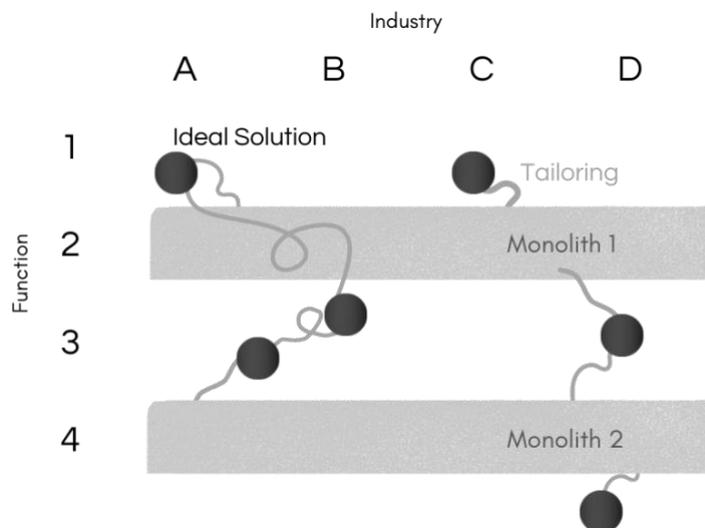

Figure 1. *X-axis: industries, e.g. Food, Health. Y-axis: functions, e.g. ERP, HR, Communications. Boxes are the horizontal monolith solutions, serving one function in exactly the same way across industries. Dots are the ideal solutions for a given function-industry intersection (e.g. Health Communications) and the squiggly lines the custom tailoring — provided by internal programmers or agencies.*

From a process-streamlining perspective, the benefits of these monoliths were high. But so were their costs of setup and maintenance. Consequently, they became a competitive advantage for large enterprises — to the disadvantage of their SME competitors. The core cost driver of the monolithic wave was the huge portion of costly human integration. Second were the high (fixed)

infrastructure costs of IT as well as underlying middleware and databases, which absent of XaaS, needed to be self-provisioned and maintained.

Software Wave 2

Then several things happened that spread functional software and its process streamlining magic to SMEs. XaaS and the Cloud cut the fixed costs of software infrastructure substantially. At the same time the Internet revolutionized how software was marketed and sold. Software was unshackled from manual implementation and integration. It became ready to use within minutes as the idea to sell software without coder hours was born.

As the sheer size of the software opportunity became increasingly evident, entrepreneurs tackled niches previously considered too small. Software became incrementalized and offered at the function / industry intersection. And SMEs with their lower budgets became a highly attractive market.

When software remained horizontal and industry agnostic, organizations had to change their processes to fit the mold of the new functional setup (see figure below). SMEs could adapt thanks to their smaller size and complexity — but only to a certain extent. Process and software interaction gaps remained and had to be bridged by human routine labor.
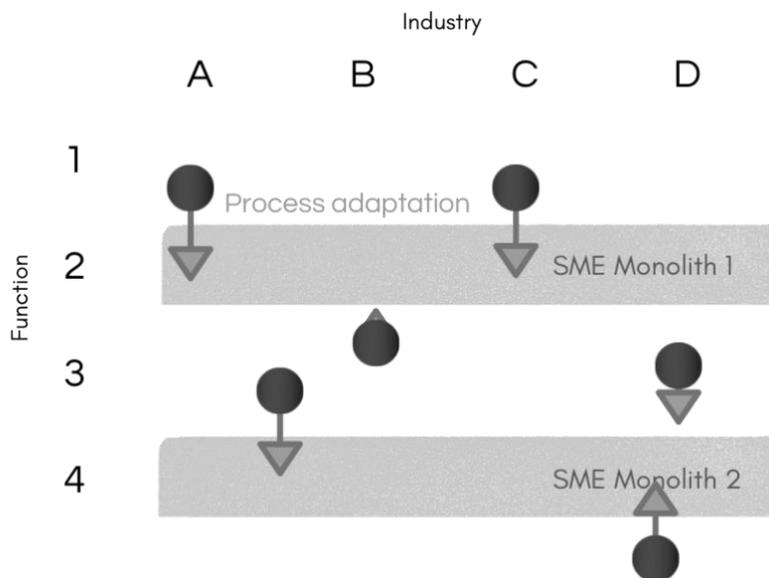

Figure 2. *See above.*

When software grew specific to a particular industry-function intersection (see figure below), less process change was necessary for this particular point. But for its integration to other intersections, too, a lot of manual effort remained.
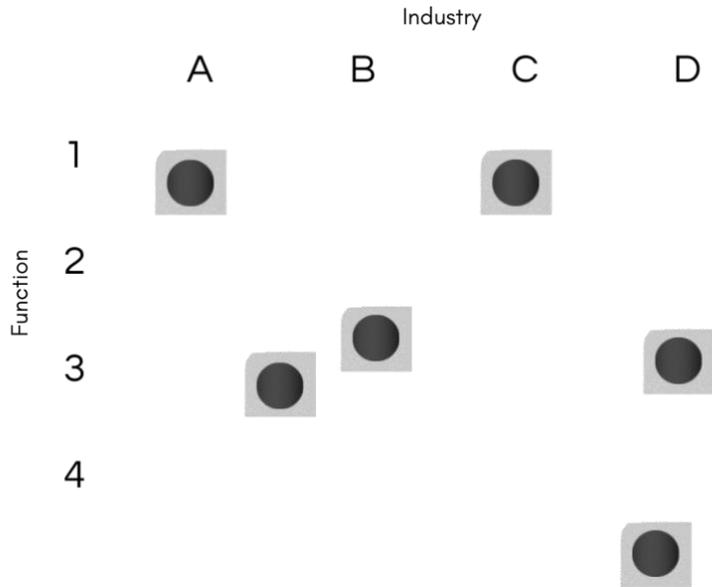
Figure 3. *See above.*

With these new tools, SMEs were able to take a significant step towards the streamlined processes and capabilities of their larger competitors. But two big issues remained: first, and as mentioned above, significant manual effort remained. Function- or intersection-specific solutions did not integrate well with each other or adjusted processes. Their gaps still had to be bridged by custom-made APIs or people copying and pasting data from one system to another. Both forms of human labor remained prohibitively expensive or difficult for most SMEs. Second, the price of individual functional solutions was still so high that SMEs did not buy software solutions for all of their functions.

Software Wave 3

Now we are in a new era and SMEs are finally getting the digital process streamlining they deserve. For many industries, Industry-Specific Operating Systems are starting to connect the dots of key industry / function intersections. Covering all the key features SMEs need to run their business, these solutions are built ready-to-use on top of modern cloud infrastructures and standardized components.

SMEs can finally afford to buy integrated software solutions for all their industry-specific functions and needs. After years of rapid acceleration, progress on individual point solutions has plateaued and many have become commoditized. Combine this with Pareto's 80-20 and suddenly SMEs can capture these functions sufficiently well with comparatively little effort. Consequently, the price of serving each industry-function intersection has dropped significantly.

Differentiation no longer comes from point solutions. Now it comes from their seamless integration via modules that integrate and improve entire business processes of specific industries. This integration is way more than a technical integration — first and foremost, it is the seamless connection and streamlining of processes.
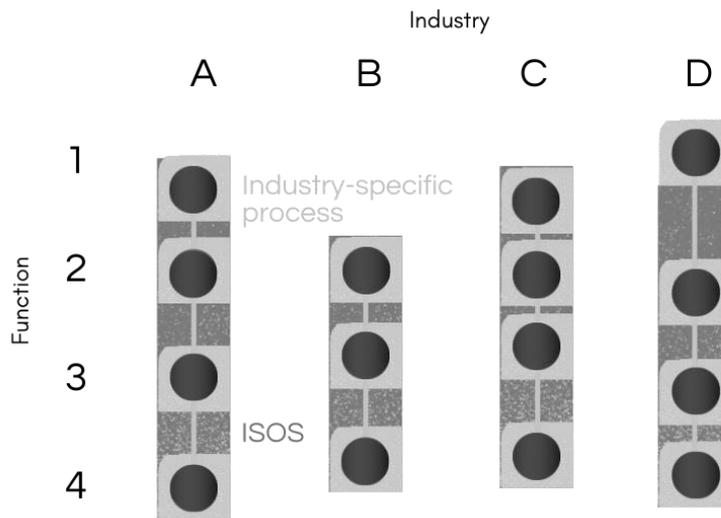
Industry

A   B   C   D

Function

1   Industry-specific process

2

3   ISOS

4

Figure 4. See above.

Thanks to ISOS, software is once again becoming a democratizing force. The Internet has pushed gatekeepers from their throne and leveled the customer access playing field for SMEs. Now software is commoditizing process efficiencies. As point solutions are becoming seamlessly integrated, IT stops being a point of disadvantage for SMEs. They can finally compete based on execution and the true quality of their product & service. And here, SMEs often outcompete behemoths:

- SMEs are often more specialized on certain product / service characteristics and have the ability to provide better quality on these.

- If they can compete financially, SMEs often have the ability to attract better people as their systems of advancement depend less on office politics.

But wait, there is more. Software is increasingly turning into a disadvantage for behemoths. With each passing day, their software is becoming more and more outdated. Most big-corp IT was first established decades ago. And most behemoths are very slow to upgrade it. The costs and complexities of migrating legacy landscapes with all their custom-built integrations and functions are simply too big. Consequently, many big corporations continue to run core parts of their business and operations on outdated technology stacks. And now they are under siege by thousands of SMEs run on cutting edge ISOS.

Further, as software was tailored to their specific needs, big corporates did not have to migrate their processes into the logic of the digital realm. They mostly developed digital solutions for processes that worked according to the logic of the analogue, mass-production age. Meanwhile, most SMEs have embraced the paradigm shift and are now playing to its advantages.

Importantly, SME are not better than any behemoth on any feature or process. It is the sufficient quality, affordability and sheer mass of all features, supercharged by integration that drives the emerging SME advantage. This is the second digital transformation of democratized ISOS and their digital

processes. An army of Davids with magic (the SMEs with state of the art software and processes) is chasing a few Goliaths stuck in the last century (the incumbents with crusty IT and organizations). Many industries are about to rejuvenate.

The Opportunity

Industry-Specific Operating Systems are integrating point solutions and streamlining processes across industries

Starting with a few essential killer functions, many providers aggregate adjacent individual functions in integrated ISOS. APIs are a crucial component; first for winning customers and second for defending them against innovative competitors.

Starting points

In development and sales (think land-and-expand), ISOS solutions have the ability to start with a focus on key features (modules) and later expand to a full operating system. They succeed in this difficult endeavor of selling an operating system but not delivering one at first by both:

- Starting with a set of killer features, or the ones whose operation and integration is very essential for a given industry.

- Integrating with unintegrated, leading point solutions at first – with the potential to later replace them with in-house solutions.

Killer features cover essential functions, or those with crucial value-add to final product quality. While this value-add is a spectrum, let's invoke Occam's razor and speak of essential and non-essential functions only. To cover each essential function, a company must decide to buy or build s.t. to price and quality relative to its competition. Successful ISOS companies offer killer features that cover essential functions much better than SMEs themselves can. These killer features ISOS integrate with leading point solutions that are still new and often expensive. When the point solutions, too, have become commoditized, ISOS replicate them in-house and replace them.

ISOS vs. API

Both ISOS and APIs are integrating industry-function point solutions. Nevertheless, an API that glues specific features is not equivalent to an ISOS. Rather, the two are polar opposites. ISOS put the integration of point solutions first, and their individual functions second. API glue solutions do the inverse. In an ISOS, the individual point solutions are 80-20 and commoditized; it is their integration into a seamless process and stack that is excellent. In contrast, in an API glue solution the individual points have 100% functionality — expensive! — and their integration is secondary.

An ISOS, too, utilizes APIs. Its motivation to do so changes over time. When the ISOS first enters a company, it employs APIs to integrate with important features it has not yet covered in-house — i.e. those that are relatively killer but not commoditized enough yet. Later, when the stack has permeated the entire organization, the ISOS utilizes APIs to integrate new killer features that necessarily appear over time. That way, the ISOS resists its own unbundling: it integrates with novelty rather than being replaced by it. And it learns about novel killer features — to either copy them or acquire their developers.

The ISOS opportunity spans multiple industries

The most attractive industries for Industry-Specific Operating Systems combine scarce killer features with fragmented markets.

Feature-wise, emerging killer features for SMEs should not yet be fully covered by existing point solutions. Other features should mostly be commoditized plus an 80-20 coverage of them should be sufficient for most SMEs. Importantly, the connection of features into a streamlined stack should be a priority. This is the case if human capital is costly or if data exchanged between features is so vast – or the exchange so fast – that this exchange cannot be done manually. To exemplify: Food. The killer feature of delivery that lets restaurants retain their customer relationships simply does not exist today, as big delivery platforms dominate. Other features of the stack – like reservations or POS – were invented long ago and many of the functionalities leading providers offer aren't needed by SMEs. And, while restaurant wages tend to be low, professional customer interaction creates so much data across modules that it is near impossible to keep up-to-date manually.

Structurally, the industry should be fragmented, i.e. much closer to perfect competition than oligopoly. We don't expect SMEs to suddenly conquer industries in which large corporates rule because of high barriers to entry (e.g. Chemicals or Automotive Manufacturing). But absent these constraints, ISOS have the potential to flip the SME-Enterprise power dynamics of many industries. Law, for example, is a perfect match for ISOS, because 80% of law firms have fewer than 10 lawyers.

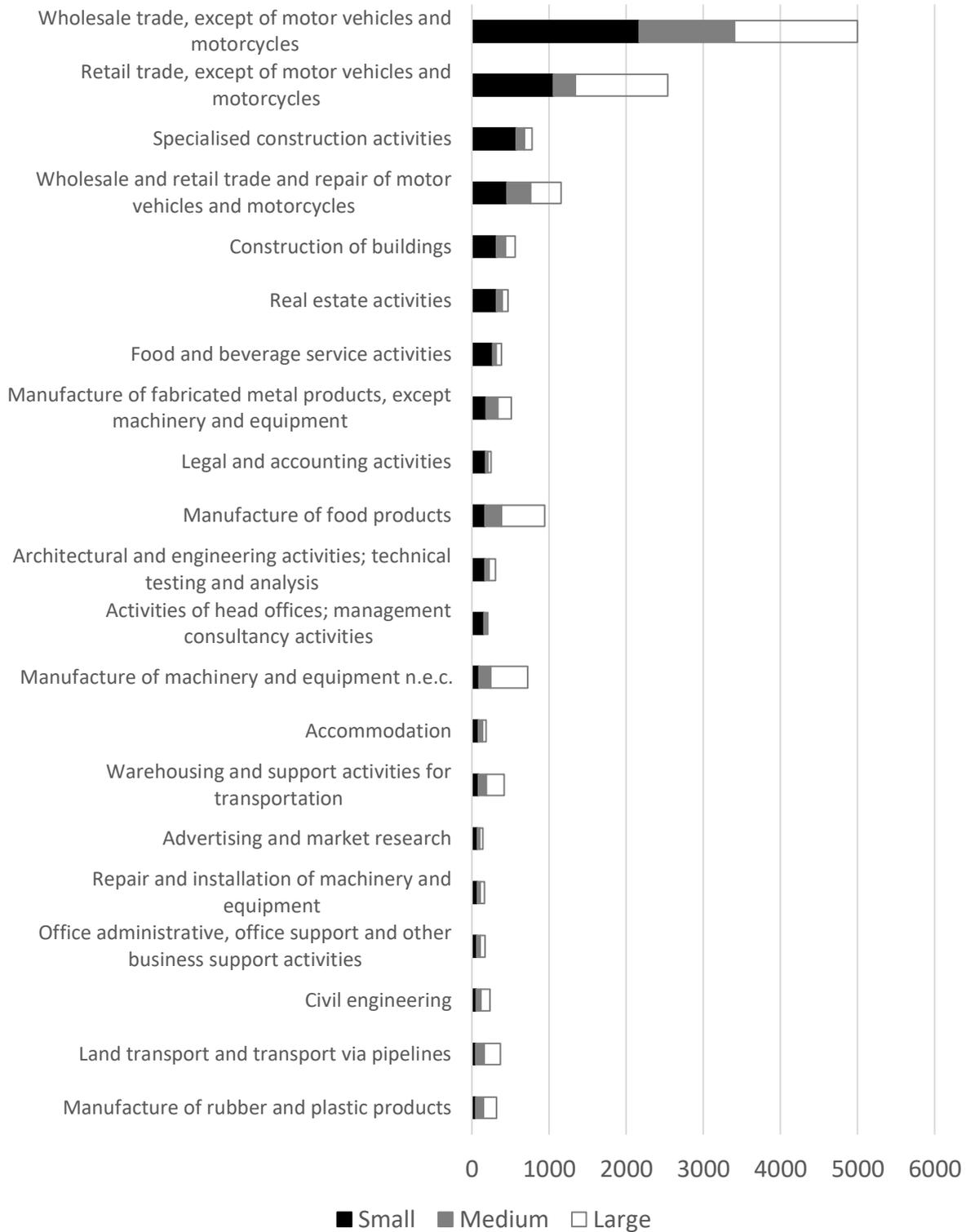## Turnover (b EUR)

Figure legend: ■ Small ■ Medium □ Large

Figure 5. Details see body.

Industries with a large SME footprint abound. The above figure illustrates this notion. It shows the turnover that small (1-49 employees), medium (50-249 employees) and large (250+ employees) companies generated in the EU27 of 2018 (Eurostat 2021). Much whitespace remains – more than this graph might indicate. For we show only the primary opportunity for ISOS solutions – industries with a SME share in turnover > 33% and an SME turnover > EUR 100b. And we exclude the many industries for which values are unavailable.

Multi-trillion dollar industries are entering a new SME era – thanks to the democratizing force of the third wave of integrated software. At Cusp Capital Partners we look forward to working with the ambitious companies pioneering Industry-Specific Operating Systems.