THE GREAT INNOVATION DEBATE: STARTUPS VS. IN-HOUSE DEVELOPMENT VS. ESTABLISHED VENDORS



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Innovation – what is it, and how does one achieve it? These questions came up at this year's Container Terminal Automation Conference in London in March 2022, during multiple sessions. While we doubt we'll come to a common understanding of exactly what it is, we will all likely agree that it is required to propel our industry forward. As an established vendor within the maritime industry, we've been exposed to a great deal of 'models' that aim to foster innovation. In this paper, we'll look at the pros and cons of innovating via startups, in-house operations, or outsourcing to established vendors before concluding with a round-up and comparative analysis.

STARTUPS

Pros

Beginning with pros, the obvious opportunity that looking to startups gives you is the vast number of companies you hypothetically could work with. Further still, in deciding which companies you are going to work with specifically, you expose your company to a wealth of new knowledge. Each company is eager to display its insights and innovative techniques.

This is clearly the thinking behind the approach that the Port of Rotterdam has taken. The port seeks to open its net as wide as possible, taking in entries from all over the globe and whittling them down until they're left with a final 14. In this process, the port not only sources the finest the port sector has to offer but also learns a great deal about the market and cutting-edge innovation.

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Another major pro is the lack of risk a port takes on with a startup. While there can be losses if a startup fails to mature, the fundamental functioning of a port or terminal remains largely unaffected, or at least not as affected as it would be if innovation was primarily sourced in-house or outsourced. As Kris Kosmala points out in Ports and Tech Startups: A New Model of Venture Capitalist, if ports utilise startup innovation via a long-term strategy involving local academia and envision their port as a test-bed, they can secure gains across the board, further allowing a startup to drill down into port-/terminal-specific issues.

Cons

Again, as evidenced by the Rotterdam example, one major plus is also a downside: while you may want to look into innovation via startups, so does everyone else. As a result, the startup market makes for a hyper-competitive landscape.

It should be considered that while startups bring the freedom of "thinking outside the box," their typical lack of industry experience and knowledge that drives their freedom of thinking is also a significant disadvantage. This double-edged sword allows for creativity, but it comes at the cost of time and money to check compliance to industry requirements and/or educate the startup on processes and industry know-how.

Furthermore, even if you were to be successful and find the ideal startup, there are notorious issues surrounding the ownership of patents, intellectual property rights, and programs. Because of this, difficulties can occur once a potential project is up and running, and on the other hand, it takes time to agree on the details before the project can begin.

One must also consider that startups are dynamic for a reason – they exist on the edge of make-or-break. Figures show that only around 25 per cent of startups last for the long haul, which means there is a great deal of risk one is

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taking on. So, should you invest, you must have strong faith in the startup you're investing in.

Finally, it should be noted that startup investments aren't tradable, unlike publicly traded stocks. Henceforth, you cannot effectively sell your stake until the startup goes public or is bought out, which could potentially be a long while.

IN-HOUSE INNOVATION

Pros

Perhaps the most obvious benefit of in-house innovation is that a terminal can focus on exactly the specific problem it is finding in the very specific conditions of its unique terminal.

A natural add-on to this approach is that in-house innovators become deeply intertwined with company culture and strategy, meaning you can facilitate agile working methods due to a high level of interaction from key departments with the benefit of troubleshooting problems in real-time. A final point in this regard is that by working in-house, those involved feel a deeper connection to the project, thus building a mutual investment in the outcome of the innovation efforts.

Cons

A natural follow-on from the benefits of a startup approach is apparent where negatives arise in the cons of in-house innovation. For instance, where startups allow you to invest in potential with a view to growth, innovating in-house is much more expensive from the outset. When working in-house, one must consider the range of costs involved – software, new staff, hardware, new working locations, rent, training days, and so on.

Further still, with talent highly sought after and at a premium, a common issue many find is that software developers are prone to change roles often. So, suppose you have a team of developers, and some key members leave. In that case, they take the knowledge of how they constructed a system's architecture with them. This means it's hard for a new developer – talented or not – to continue with progress efficiently. According to a report prepared by Glassdoor, it takes about 30 days to hire a programmer, and this number will likely grow in the coming years.

Finally, our experience with in-house development is that it becomes extremely expensive very quickly. There also seems to be an 'Alice in Wonderland' thinking approach to investment in in-house projects, which seems to contradict the risk-value paradigm. The further you travel down the investment 'rabbit hole', the more committed you are to doing whatever it takes to see a project through. It is not uncommon for in-house projects to run significantly over budget and over time. When you consider that this approach is typically not scalable outside of your organisation, it does beg the question of whether the investment will actually deliver a strong ROI.

OUTSOURCING

Pros

Unlike in-house development and investing in the future potential of a startup, the main benefit of outsourcing is that you have products, expertise, and teams ready to go. Terminals can thereby look to organisations with long-standing ties in the maritime and technology sector, ensuring those they work with are extensively trained and knowledgeable with regard to the needs of a modern terminal. Naturally, this should, in theory, mean any bugs and integration issues have been ironed out beforehand.

Further, established companies bring a track record of delivering solutions that generate value for their customers from go-live. External vendors have immense pressure to realise value quickly – it is literally backed into their business models. Without proving value, they will quickly cease to exist within the market.

Organisations with experience within the container terminal industry also bring knowledge that counterparts just entering the industry do not have. It cannot be understated how crucial experience is in getting technology projects off the ground in the maritime sector. Given the commercial nature of a vendor's organisation, they tend to attract and retain experienced talent better than startups or in-house teams can.

Cons

While outsourcing saves time and minimises risk, you have to pay for that benefit. Traditional business models for acquiring software place the vast majority of the project risk on the vendor. Subsequently, vendors increase rates to cover the increased risk profile. Newer business models, such as agile projects with a greater deal of shared risk, help to reduce costs.

Further still, even when implemented, you do not have the advantage that you do with an in-house team or even a startup, in that the company you're outsourcing to holds the master key with regard to the functioning of systems. On top of the above, outsourcing means you may well have to wait for support and insight, all while your operation needs continue on in real-time.

COMPARATIVE ANALYSIS

Each approach to innovation has its upsides and downsides, and the upsides to one approach imply downsides to another method. For instance, whereas startups offer you plenty of potential, they offer no guarantee of success like outsourcing may. However, while outsourcing does mean you'll be working with established systems and technicians, you run the risk of reduced autonomy within a project.

Given the above, the approach to innovation is highly dependent on what a terminal needs and the capacity it already has. To clarify this further, ex-Head of Supply Chain & Transport Industry at the World Economic Forum, Wolfgang Lehmacher, offers some insight. He states that innovation at a small scale is probably best and most efficiently achieved with a terminal's own teams. In some cases, for small-scale projects, it's worth considering a limited investment in smaller startups. However, significant leaps require large solutions – either off-the-shelf products offered by vendors or tailored solutions built by internal teams that usually work with external developers.

With regard to the risk of failure, it is similar in all three cases, according to Lehmacher. He stated that an internal team could miss time and money budgets or fail completely, while off-the-shelf packages might not fit. Startup solutions might not meet expectations, and teams of 'geniuses' could potentially leave.

Lehmacher believes that buying advanced technology and partnering with technology companies and startups does not work without digital talent within the terminal. Hence, terminals need to select the most appropriate partners and solutions while experts ensure proper implementation and integration. Maintenance and continuous development of the systems and tools are also mandatory in today's fast-paced world.

WRAP UP

The above unbiased analysis of the three prominent models is intended as an educational piece. We've left our own bias to the side to allow for a healthy discussion of the three models based on facts and expert insights. There is one additional point to be raised to allow for a healthy debate on this topic – as an industry, we need to be willing to rethink the business, contract, and partnership models by which we engage with external vendors. All too often, we enter a project sale with a 'forward-thinking' company only to establish a traditional vendor supplying software contract arrangement which in turn stifles innovation within the project and, subsequently, the industry.

A reminder of this is the saying: "If you've seen one port, you've seen one port." The business/contract model for one terminal isn't going to be the best fit for the next.

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ABOUT THE AUTHORS

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ABOUT THE ORGANISATION

INFORM specialises in AI and optimisation software to improve operational decision-making. Based in Aachen, Germany, the company has been in the optimisation business for 50 years and serves a wide span of logistics industries, including maritime, intermodal, and inland terminals. With a broad range of standalone and add-on software modules, INFORM's unique blend of algorithmic-based software expertise, rich industry experience, and big-world thinking delivers enormous value for their customers.