Agnostic Technology
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«Agnostic» defined

Whether an operator implements an agnostic solution depends on many things — such as age and value of their legacy systems, institutional bias, a lack of understanding of agnostic systems and related to that, information asymmetry (where one party knows much more about the subject and uses that to their advantage). But also how our toll industry understands and defines the term.

Because of the qualitative nature of agnostic, there is semantic aspect to the article — not intended to be too scholarly, but because agnostic simply is not so clearly-defined. Agnostic[1] is both a concept that is subjective and parochial, and also technical state of being. This makes its meaning rather akin to, «I know it when I see it».

In IT, agnostic technology has a different meaning — it implies that something is not limited in what it knows — enabling something to function without knowing the underlying details. As with the concept of interoperability – with which tolling is very familiar – agnostic systems are typically enabled by either compliance with widely-used standards or added elements (such as coding) that will enable one system to function in a variety of environments. Again, if you emphasize the 'not limited' part, you begin to see the applicability to tolling and, moving from Huxley's meta-physical context to a physical one, there are three elements of a technology agnostic solution — platform[2], protocol[3] and device[4].

To be technology agnostic in modern tolling is to not not know, to know everything, work with anything, and be limited by nothing.

Our agnostic approach

A-to-Be® provides Tolling and Road Solutions focused on advancing mobility solutions with a technology agnostic mindset. What do we mean by that? When we think agnostic, we describe open, modular systems — off-the-shelf modules if necessary — and a service design approach for implementing solutions from the lane to Back-office. **Technology Agnostic means A-to-Be takes a supplier neutral approach[5].**

We believe this is not being done in the tolling industry today — solution sets tend to hold captive a toll operator in that they are closed and locked to a set of devices, protocols and platforms, designed to suit the needs of the vendor rather than the operator. Our technology agnostic approach can be seen working in the USA in Northwest Parkway in Denver and Southern Connector, both with ETC and cash lanes.

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[1] The greek *root of agnostic* is «gnosis» and stand for «knowledge» and placing an 'a' in front of a root makes it the opposite. «A-gnosis» means without, or non-knowledge. Thomas Henry Huxley, a 19th century English biologist, popularized the term and used it to describe people who believe that certain metaphysical questions cannot be known, such as «Why do we exist?» Agnostics believe there is «no-knowledge» on the subject — it can't be known.

[2] *Platform Agnostic* There are several technology platforms on the market today, including Microsoft, Amazon, Linux, Unix, Mac. In short, you are in technology nirvana when your toll collection software is «platform agnostic», running on any OS the toll operator wants.

[3] *Protocol Agnostic* The toll industry is acutely aware of the word protocol due to the historical challenge of getting toll devices to communicate effectively when they use different protocols or, languages. How does data from multiple protocols act communally and interoperate? As in IT, the goal is for devices — and data — to work together on a common protocol, seamlessly. To be protocol agnostic is to not «not know» a protocol – in restated, to be flexible to know, and use, any protocol the tolling customer wants.

[4] *Device Agnostic* Similar to the above, non-agnostic toll industry protocols and platforms lead to interoperability and communication issues — so do the devices themselves. Device agnostic means you are not limited to one type of device.
A TCS' software is thus flexible enough to work with any device the customer wants.

[5] A *supplier neutral approach* is a simple concept to integrate a complete state-of-the-art solution where each component is not dependent on specific vendors. The advantages of this approach to the toll operator are significant, no longer held hostage to a single supplier, and thus increasing the ability to negotiate with a larger market, not just for equipment, but also for operation and maintenance costs and, indeed, to the entire solutions' lifecycle.

Benefits of not *not knowing* — scenarios

Adopting a technology-agnostic strategy, particularly when beginning with a closed, legacy system, has challenges — but short-lived ones. The agnostic path ROI is paid back forever, for both operators and solutions providers. Here are some scenarios where agnostic TCS solutions do that.

A vendor changes its technology

An operator — happily settled on a single platform — realizes one of its vendors decides to change their platform. Is he forced to change the platform or can it stay with its existing underlying technologies? If it adopted an agnostic strategy they can keep their platform, even if the operator's legacy platform product was effectively disrupted with the vendor's change, rather than completely convert their product to it, they can keep their platform.

This means that the operator can change or add a new type of lane without changing the underlying Toll Collection System platform.

Migrations

A TCS solution provider uses technology agnosticism as a strategy to evolve and migrate their system over time. The company had a large in-house application that was developed in Java and, after a number of years in production, they decide it should be migrated to .NET. Rather than rewrite the whole thing at once — a process that could take years — they are able to rewrite smaller layers of the application for the new platform to bridge between the newly rewritten layers and the legacy portions of the application. During the process, the evolving application can be tested while kept in production, so that functionality is never lost.

New parts acquisition

An operator adopting an agnostic TCS solution — such as A-to-Be®'s —, when faced with the need to procure a new lot of ETC antennas, gets to issue a broader request, as it can use multiple suppliers, instead of being locked-in with a single one. This is similar to when you go to buy a printer for your home computer — the operator gets to choose amongst all the brands in the market... without changing the computer.

Mergers and Acquisitions

Companies can find themselves in a situation where they've either acquired a business unit or a product that was based on, say, the Java platform while they themselves were .NET-centric. The initial impulse could be to replace newly acquired software for the usual platform, in an effort which is expensive, time-consuming, potentially error-prone and, ultimately, a waste of resources. With an agnostic strategy, these customers were able to easily and efficiently integrate the systems.

Becoming a «know nothing»

While the authors assume the toll industry agrees with the goal of becoming technology agnostic, this position is not universal.

Many work to protect the benefits — to them — of closed, fragmented systems, while others will claim an already technology agnostic industry, simply because it achieved interoperability between X and Y alone when, in fact, they stopped short of doing Z and thus depriving the larger community of the benefits. Toll operators remain having others decide their future for them.

This is important. When a stakeholder decides it cannot support a group goal — or if the group cannot articulate a clear definition and path — others will step in and define it for them. The benefits fall to one seat at the table living of uncertainty, doubt and misinformation, a product of their efforts. This leads to a fragmented industry, risking integrated national tolling's successful transitions.

A-to-Be®'s conviction is that toll operators deserve a share of the benefits of technology agnostic solutions and should not leave them on the table anymore — they cannot afford to. Tolling professionals experience on a daily basis the portability of many other technologies (phones, computers, communications) in their lives. The question is — why not for toll collection, as well?

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There are good news. Once the toll industry bases its efforts on a common understanding of what technology agnostic means — and understand its benefits —, the right path should reveal itself. And not only will it be in a better position to chart its own future, it will be exposed to levels of efficiency, cooperation, evolution, migration and innovation it has not enjoyed before.

This article hopefully leaves readers with a better understanding of agnostic in the tolling context, how A-to-Be® applies it — why you should want it.