

Develop In-House or Buy?

Executive Summary

With software engineering there are many apparent opportunities to purchase outright a ready-made product, make use of Open-source product, or even develop components where the labour costs are economically conducive, for inclusion into your product or system. So how do we decide whether it is best to outsource a product, component (or even a part of the process) or if that investment would be better made in-house (and in doing so improve our own product or process capability)?

When we talk of 'buying' a product are we actually committing to have a bespoke product commissioned for us, purchase a mildly-tailored product, purchase a product that we can configure for our use, or acquire a truly commercial off-the-shelf (COTS) product (frequently referred to as 'shrink-wrapped', because of the typical style of packaging!).

This paper sets out a visualisation technique and some strategy advice that you can use to make the business decisions regarding the best value route.

A companion paper entitled [Acquiring Software](#) lists some of the attributes that you may wish to consider, or acquire some evidence from the provider, before committing to a purchase, assuming you have made an initial decision to acquire/purchase rather than build in house.

The Business Decision

A simple tool to aid communication (and good with the business leaders) for decision making is the classic quadrant diagram for visualising where you are in your engineering capability with respect to a new product or process.



To populate the diagram typically you enumerate your capabilities, usually by deciding on the criteria to be judged in both axes (criticality and capability/competitiveness) along with a scoring/weighting arrangement. You then apply the technique to the range of products, or in some

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cases, the experiences of your engineering team, for those key (i.e. those that drive a high proportion of cost, or risk) components within those products, to look for patterns and alignment.

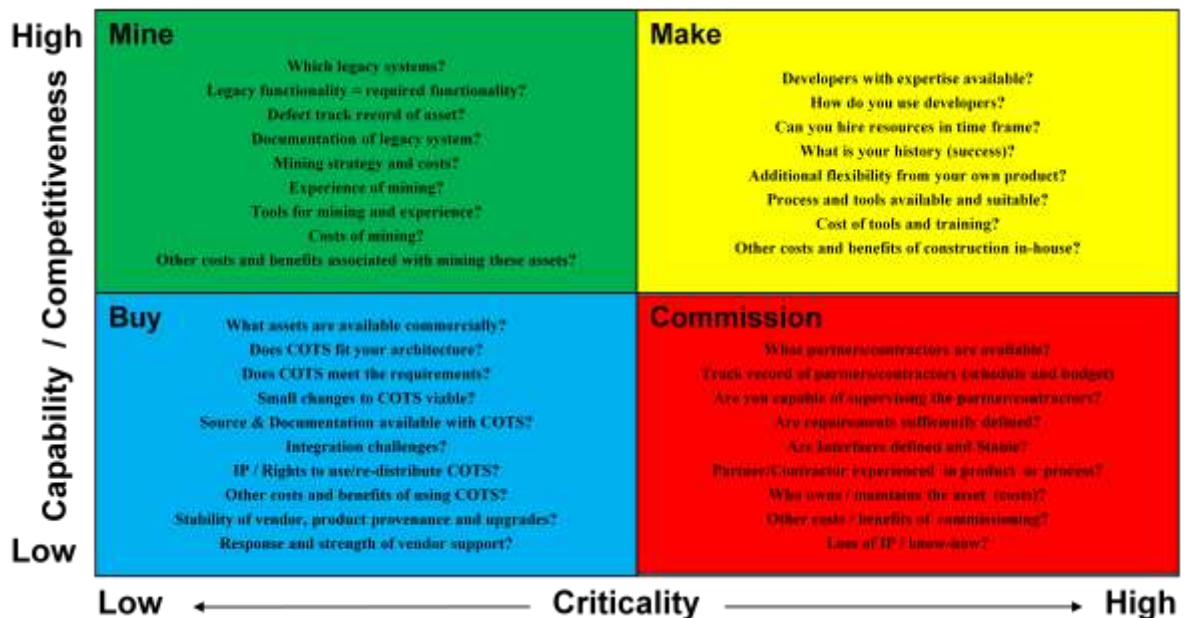
The technique also requires you to realistically benchmark yourself against reasonable competitors, or their suppliers, in order to make an objective judgement on capability and competitiveness.

In so doing, it informs you where you should invest and where you should seek to divest, partner or purchase. This should be taken as strategic direction for patterns near inner boundaries, or at the centre, and of tactical significance for outliers (near edges of diagram). Healthy positions are clearly differentiated, as top-right (yellow) or bottom-left (blue) quadrant.

'Commission' arrangements should be seen as business protection and need to be suitably contractually bound lest your IPR leak, or the advantage that you have purchased be given (sold) to a competitor. Partners in this quadrant, who are key to your business, are frequently considered for strategic acquisition and may naturally move through some investment of your business in its ownership, through say a joint-venture, to finally being absorbed into the business, if not originally tenable as an outright acquisition.

The Technical Assessment

In support of that assessment, the criteria and weighting needs to be derived. From a software engineering perspective there are attributes that help 'inform' you as to which quadrant they may exist in (although the degree will be determined by your scoring/weighting system). You should define a weighting system that deliberately tends to discriminate, moving away from the axes, so avoid scoring 'middle' values to make the visualisation more apparent.



When considering the 'Control' quadrant, a business will be concerned that it is spending its (precious) engineering effort on something that could be obtained elsewhere (hence the advice to find opportunities to move 'Control' (Green) to 'Make' (Yellow) or 'Buy' (Blue)).

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In software systems, typically 'Control' is related to legacy capability; the cost of engineering being significantly reduced by the ability to "re-use" artefacts from other products or processes and so differentiate them from a 'Buy' as a COTS component position. In the technical attributes we can then make our assessment based on the suitability for re-use, so in general we can recast 'Control' as 'Mine'.

Focus on Value

In modern business the business must focus on what its differentiating features and hence value to the market. Often in software systems these margins are small, are connected to a narrow window of opportunity and resource constrained. These attributes means that it makes no business sense to spend its precious engineering effort re-inventing what is readily available, struggling over something for which someone else is eminently more suited and capable, or is available (albeit at a cost of a licence or royalties) as commercially available product. These assessments are therefore key to the profitability of a business and because the world of software is in significant growth, need regular re-appraisal.

Retain Expertise

Although you may decide that a product, process or component thereof, should be moved to another quadrant and handled by a 3rd party, you cannot dismiss the need to carefully manage these components.

COTS products (in the 'Buy' (Blue) quadrant) have a habit of being 'updated', including both error corrections and new features, but often derogating old features on which you may be dependent.

Partners, especially those in the 'Commission' (Red) quadrant, must be held to account on programme deliveries, content, quality and this will require oversight to ensure suitable processes, skills and local programme management are in place. Resorting to a contractual argument is usually a sign of failure... which may be critical to your business value.