

Stress testing your patents

Some of our clients can spend tens of millions on the development of their products, but the patents protecting them are sometimes not as water-tight as they believed.

In such circumstances we have often helped our clients to understand how a competitor might be able to work around their intellectual property (IP) without infringing it.

This process involves detailed analysis of the relevant patents to understand exactly what is, and more significantly what isn't protected, and then putting ourselves into the shoes of a potential competitor and using our creative experience to devise functionally equivalent solutions that avoid the protected elements.

The exercise can sometimes lead to opportunities to strengthen the existing IP portfolio through filing of additional patents, or as a minimum simply provide greater awareness of the areas of potential vulnerability.

A related area where we often add value is in helping clients to understand how pre-existing IP can affect their

developments. This can include identifying main players within different markets and identifying emerging technology trends that may have an influence on investment or design decisions.

Our work has also included several projects where we help our clients understand the technology or market feasibility of patent groups they own, where a technology is yet to be fully developed, or looking at IP covering hugely successful products already in the marketplace.



42 Technology bridged the gap between our in-house development and IP teams. Working closely with both groups, their experience working across many industries was invaluable in helping us to understand alternative means by which a competitor could attack our product range without infringing on our IP.

— Senior Intellectual Property Counsel
for a global Food and Drink manufacturer

We help our clients understand the impact of intellectual property.

Trends & IP Landscaping

We identify key players and technology trends that may influence investment or design decisions.

Patent stress testing

We illustrate how competitors might circumvent IP, so that patent portfolios can be strengthened. We assess patents surrounding competitor products.

Novelty & Protectability

We determine IP feasibility and strategy during technology development.



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Improving Huggies® Baby Wipes consumer experience

42 Technology has been helping Kimberly-Clark to improve consumers' experience of using its Huggies® Baby Wipes in particular improving wipe dispense.

In order to bring fresh thinking into the project, Kimberly-Clark asked 42 Technology to carry out an investigation into the dispense performance of the existing packaging and identify potential options that might enhance the consumer experience, whilst requiring minimal changes to the product design and maintaining compatibility with the current manufacturing assets.

Through a process of testing in the lab combined with theoretical modelling of the dispense mechanisms, the team established an understanding of the principles that underpinned dispense performance, allowing efforts to be focussed around some specific product attributes.

The final concept involved minimal changes to the product design and delivered an enhanced consumer experience, whilst having zero impact on cost and only a minor change to the manufacturing process.

Technology Readiness, or should you be thinking about Commercial Readiness?

— Zane van Romunde, Head of Transport Sector

It is rare that all you need from a technology is for it to work. You don't need to sell it, you don't need to mass-produce it, you just need it to do what it is supposed to.

Like going to space. Before re-usable space planes, going to space was a must-work, one-off endeavour. And for this sort of mission, a Technology Readiness Level is all that is needed to gauge how far you are from lift-off.

Few technology development undertakings are however destined for the outer galaxies. The vast majority are for commercial gain — to attract and retain customers, or to increase margins. And for these ends, measuring progression against a **Technology Readiness Level** (TRL) scale ignores the ground truth — that technology doesn't just need to work, it also must pay.

Adoption and adaptation of NASA's original TRL definitions has been attempted by numerous companies, organisations and industries. Whether as translations into alien languages or attempts to align business units, almost universally they fail to acknowledge that the market and cost have as much thrust on the outcome as the technology itself.

Where commercial considerations are taken into consideration, such as in the Commercial Readiness Index conceived by the Australian renewable energy sector, misalignment of technical and commercial levels only adds complication and confusion.

An organisation-wide (or even industry-wide) measure of product development maturity is a useful tool. It aligns expectations of timing and required investment, and provides a quantitative launch readiness indicator. It allows prioritisation of risk and hence guides activity to reduce it. The key is that risk is not just present in the technology, but also in its commercialisation. To be of use then, a readiness measure takes these units into account in its scale.

Ask the right questions

In space, distance is measured in light years — time and length are easily confused. In business, technology maturity has other dimensions beyond “*Does it work?*”.

“*Does the market want/need it?*” and “*Will it deliver profit?*” are other questions that will determine mission success, or otherwise. The answers to these questions are very much inter-related. The basic technology question relates to its cost, and to market demand through its functionality. From minimum viable product to the full 'Rolls-Royce', this circle can be squared in many ways. It is also important to remember that markets can be external or internal business operations, each with their unique dynamics. The question of profit includes both the impact on production costs and operational cost reductions.

When viewed through this telescope, the **Commercial Readiness Level** (CRL) is a much more meaningful measure of product development maturity. The CRL builds upon the TRL, but at each level includes considerations of the commercial aspects of the technology, in line with a revised understanding of its “technical maturity” to mean a “lack of risk”.

The relationship between TRL and CRL

Like the TRL, the single CRL scale goes from 1 to 9, 1 being the inkling of an idea and 9 being a mature and proven product that has been generating expected profit levels for a period of time.

For example, where NASA labels TRL 6 as: “System/subsystem



model or prototype demonstration in a relevant environment,” a CRL definition would be “Level 6: Verification of commercial case based on fully functional prototypes.”

Each level’s title is the outcome of the activities undertaken therein. For example, CRL6 would be demonstrated though:

- Looks-like and works-like product prototype demonstration in a relevant environment
- Feedback from target market segments
- Prototype production process with scalability to expected volumes
- Business case verification based on trade-off optimisation (functionality, cost, demand)

Likewise, each CRL level may be defined as in the table below, with technology, market and production cost de-risking activity taking place within each level to demonstrate its achievement.

The objective is to develop the right product, not any product in the least time.

Hence, managing product development through CRLs should not be about rewarding the attainment of higher levels quickly, but rather about making informed choices regarding product attributes which will deliver commercial rewards. Iterating within, or even between, CRLs as the product is developed should be encouraged.

Above all, CRLs are about technical, commercial and manufacturing team mission control.

Now wouldn't that be out of this world?

Commercial Readiness Level — CRL		Technology Readiness Level — TRL ^[1]
Mature and proven product that has been generating expected profit levels for a period of time	9	Actual system proven through successful mission operations
Profitable mass market launch of product through full production, marketing and customer channels	8	Actual system completed and qualified through test and demonstration.
Positive business case from production tooled prototypes released to tame market	7	System prototype demonstration in an operational environment
Verification of commercial case based on fully functional prototypes	6	System/subsystem model or prototype demonstration in a relevant environment
Positive commercial case based on production-intent prototype testing with target market	5	Component and/or breadboard validation in relevant environment
Positive commercial case based on looks-like/works-like/made-like prototype testing with target market	4	Component and/or breadboard validation in laboratory environment
Positive cost and market models based on demonstrated proof of concept of novel features, markets or processes	3	Analytical and experimental critical function and/or characteristic proof of concept
Commercially feasible paper-based concept design with outline cost and target market	2	Technology concept and/or application formulated
Idea of cost-effective, market desirable technology/product with supporting evidence for commercial feasibility	1	Basic principles observed and reported

[1] https://en.wikipedia.org/wiki/Technology_readiness_level

