Technology, standards and embedded products

MODULE 4 | 4.5.2 | STUDENT COMPANION

Data helps organisations start from customers' pain points rather than from what they can make. **Machine learning** finds patterns and segments nobody thought to test, and combining demographic and geographic data reveals unserved niches. Failure, warranty and service records show where products disappoint; clicks, searches and social media reveal interest. Data must be collected and used lawfully, ethically and securely.

The long tail



Imagined example: an online store selling replacement parts for older household appliances. Each part sells only a few times a year and no shop could stock them all, but tens of thousands of parts add up to a large, loyal business, and search data shows which parts to add next.

Testing ideas quickly

Method	How it works	Benefit
Rapid online releases (lean)	Build a simple version in days, release, measure, adjust, repeat	Speed, low cost, early fit with needs
Landing page	Describe a product that doesn't exist yet; invite pre-orders or sign-ups	Evidence before spending much
Crowdfunding	People pledge money before the product is made	Tests demand, raises funds, creates committed early customers

Worked example: a landing-page test (imagined)

A start-up tests an app for booking school-holiday activities before building it.

Item	Working	Result
Visitors to the page	Given	2,000
Sign-ups at $9 a month	Given	140
Conversion rate	140 / 2,000	7%
Monthly revenue if all sign-ups subscribe	140 x $9	$1,260

Two kinds of standard

A standard is a format, interface or system that lets products work together, such as chargers, payment cards or web pages.

De facto standard	Public standard
Emerges from competition in the market	Agreed by an industry body or required by law
Owner can earn large, lasting returns	Open to all, so no single organisation gains an advantage
Can take years to emerge; investment duplicated; customers hold back	Avoids uncertainty and speeds up the market

Winning a standards war



The trade-off: tight control captures more value per user; openness wins more users

The trade-off: imagine a company that has designed a charging connector for electric scooters. Keeping it closed collects every royalty, but rivals may rally around an alternative; licensing it cheaply may win the market but earn less per scooter. Customers also buy a whole system, so overall quality matters, and approaches that still work with what customers already own usually beat ones that make them start again.

Case note: the Qi wireless charging standard

In the early 2010s, rival groups promoted competing ways to charge phones without cables. The Wireless Power Consortium backed a standard called Qi, while rival groups backed other approaches, two of which later merged. The Qi group built a large membership and licensed its standard widely, and when Apple adopted Qi for its iPhones in 2017, the contest was effectively settled. Apple later contributed its magnetic design to the next version of the standard.

Sources: Wireless Power Consortium announcements; Apple product releases, 2017; technology press coverage.

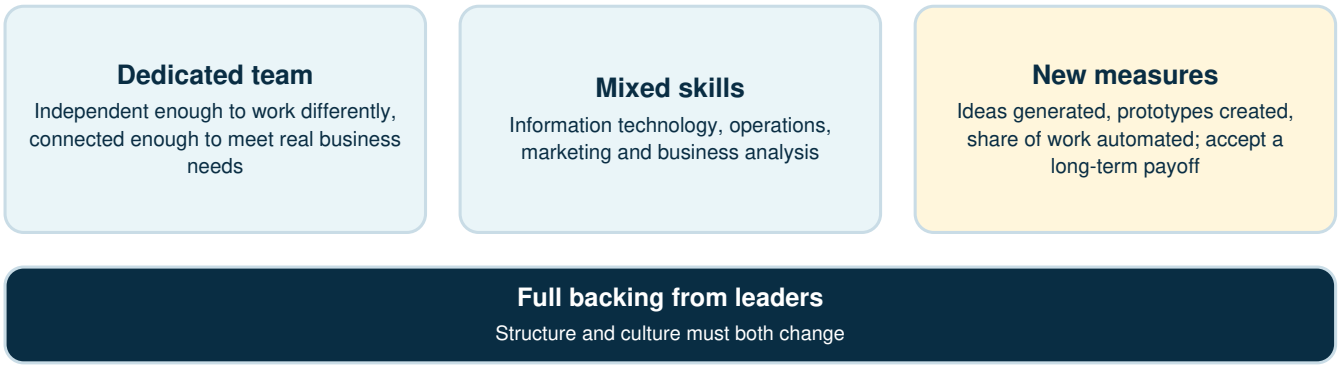
Case note: Michelin's tyres as a service

Michelin offers truck fleets the use of tyres as a service: the fleet pays according to the distance its trucks travel, and Michelin manages fitting, checks, maintenance and replacement. Customers get predictable costs and fewer breakdowns; Michelin gets long-term relationships, steady revenue and a reason to make tyres that last. Launched around 2000, the service at first grew far more slowly than planned and struggled to make a profit: pricing and running a service proved much harder than selling tyres.

Sources: Michelin company publications; IMD case study on Michelin Fleet Solutions.

- **For the CPA:** revenue arrives monthly over the contract instead of at the point of sale.
- The tyres remain Michelin's assets, on its own books.
- Pricing per kilometre needs reliable data on wear, maintenance and repair costs; underpricing locks in losses.

Building products into services



Judge it only on this year's profit, and it will never get started

Practice questions

MODULE 4 | 4.5.2 | TRY THESE BEFORE THE WORKED ANSWERS

Question 1 - Three landing-page tests

The founders will build an idea only if conversion is at least 8% or monthly revenue from the sign-ups is at least $5,000. Calculate both measures, then decide what to do with each idea.

Idea (imagined)	Visitors	Sign-ups	Monthly price	Conversion and monthly revenue
A. Meal kits for shift workers	3,000	90	$60	
B. Dog-walking subscription	1,200	132	$40	
C. Language tutoring app	5,000	150	$12	

Question 2 - Open or closed?

Imagine **VoltDock** has patented a charging connector for electric scooters and supplies 30% of public scooter chargers. Two rival connectors compete, and city councils want a single standard. Should VoltDock keep its design closed or license it widely? Explain the trade-off and the resources that would help it win.

Question 3 - Buying tyres or paying per kilometre

Compare the fleet's annual cost under each option, then list two non-financial factors.

Item	Imagined fleet of 40 trucks
Distance per truck	150,000 km a year
Buying tyres	Tyres $9,000, fitting and maintenance $2,500, breakdown costs $1,500 per truck a year
Tyres as a service	8 cents per kilometre, covering tyres, fitting, maintenance and replacement

Worked answers

MODULE 4 | 4.5.2 | WORKED ANSWERS - ATTEMPT THE QUESTIONS FIRST

Question 1 - Landing pages

Idea	Conversion	Monthly revenue	Decision
A. Meal kits	90 / 3,000 = 3%	90 x $60 = $5,400	Build cautiously; work on raising conversion
B. Dog walking	132 / 1,200 = 11%	132 x $40 = $5,280	Build: passes both tests
C. Tutoring app	150 / 5,000 = 3%	150 x $12 = $1,800	Drop or rethink: fails both

Question 2 - VoltDock

Trade-off: keeping the design closed captures more value per charger but risks councils and rivals backing another connector; licensing it widely, at a modest royalty, speeds adoption and could make it the standard. With councils wanting one standard and VoltDock already holding 30% of chargers, **license widely** and seek adoption by an industry body. **Resources that help:** its installed base of chargers, its patents, the ability to keep improving the design, early-mover advantage, partnerships with scooter makers (complements) and a reputation for reliability.

Question 3 - Tyres

Option	Working	Annual cost
Buying tyres	($9,000 + $2,500 + $1,500) x 40	$520,000
Tyres as a service	150,000 km x $0.08 x 40	$480,000
Saving	$520,000 - $480,000	$40,000 (about 8%)

Non-financial factors: predictable costs and fewer breakdowns; Michelin-style data on tyre wear; dependence on one supplier; and costs that rise if trucks travel further.