The lean machine

A significant challenge faced by any new or expanding venture is the need to carry out early market testing with a representative prototype. This is required in order to confirm the viability of the market proposition which underpins the business plan.

As a consequence of this imperative a Venture will be faced with the prospect of how to rapidly and efficiently develop such a product, possibly without access to many of the necessary critical skills and resources.

Small businesses and start-ups have significant resource limitations and will generally rely on highly motivated 'all-rounders' to try and bridge the gap. However this often results in mistakes and missed windows of market opportunity. Additionally the process can consume substantial amounts of a Ventures investment capital before any real hands on feedback is received from the market.

As a consequence many ventures will at best provide a suboptimal return for investors and worse prove a total failure.

This article examines the real world problems facing ventures and their Investors and how, within the context of Rapid VenturingTM, an investment can benefit from the application of Lean Product Development techniques.

Drivers for LPD

Recent history has seen Investors taking an increasingly risk adverse perspective as a result of the technology sector collapse, as typified by dotcom. They therefore look for higher levels of certainty and better risk management when it comes to the market proposition and its delivery.

Markets are continually changing accompanies by a reduction in product and proposition lifecycles. As a consequence the window for a Venture to make a return out of a particular product development is reducing year on year.

Globalisation and greater access to knowledge networks are further lowering the barriers to competitor entry. This means that competition must be defeated more by first mover advantage and rapid deployment rather than relying so much on a defendable intellectual property pool.

The pervasiveness of information systems supported by information technology supports new ways of project working which were previously not possible. This is augmented by changes in the labour market, where there are an increasing number of highly experienced independent 'hands on practitioners' who have the had the benefit of working on a significant number of representative developments.

There has also been a sea change in corporate culture over the last few years; Investors have been issuing edicts for their Ventures to run 'lean and mean' in order to be able to be more flexible and survive change.

Ventures therefore need to continually review both their product and deployment strategies and to be able to rapidly respond to the changing market and competitive landscape.

Techniques for LPD

The following techniques may be use individually or in combination depending on the characteristics of the target Venture:

Business Review

It is well understood that any initial or new round of funding should be accompanied by thorough 'Due Diligence' of both the product and its deployment plan. A critical evaluation of the product plan and development estimates often highlights major oversights and risks which have not been considered.

Key areas to be assessed during this analysis include: providing an assessment of the underlying technology's strengths and weaknesses. Determination of the quality, viability and effectiveness of the product and the processes to be used for its production. An analysis of 'state of the art developments' and comparisons in conjunction with a review of related and competitive technologies.

It would be usual to include an evaluation of intellectual property including the patenting position and possible infringements. Structured interviews with key personnel, particularly in relation to their experience in developing and deploying similar products, is beneficial. This technique will usually culminate in a report summarising the technology assessment findings including a comprehensive risk assessment.

Whilst the above review would normally be carried out prior to an investment, what is often overlooked are the ongoing product and technical reviews as the business rolls forward.

Rapid Prototyping and Market testing (Pilots).

Specialist providers are able to offer a variety of rapid Prototyping Services within a particular field of expertise. Categories would include:

- Hardware development techniques which includes the use of FPGA modelling for ASIC design, cycle accurate modelling and the use of fast turnaround circuit board specialists.
- Software development techniques include the use of toolkits, test applications, well defined APIs, emulation tools and software modelling.
- Physical form development can be achieved via CAD/CAM and Stereo Lithography.

The importance cannot be understated of matching the correct tools and

techniques to the development of the product, whether it is complex hardware control developed in an FPGA, the rapid development of a user interface in Java or reuse of an existing mechanical design.

These tools and techniques need to be coupled to the skills and experience of the development team. Rapid prototyping is not the phase to introduce a team to new development methods.

In conjunction with the above elements a 'Systems Integration' approach' enables the Venture to make use of tried and tested elements which are 'glued' together to give the desired product functionality. Whilst this approach is not cost effective for volume deployment it enables a rapid and early representative market experience.

Typically products developed in this way would be used in market focus groups and market pilots.

Outsourcing

As part of the initial and ongoing business review the Venture should always conduct an analysis of internal and external options available. As a basic best practice principle any company should concentrate on strategic services internally, and act to "eliminate, limit, or outsource" the rest.

Services which can be successfully outsourced by an experienced outsourcing practitioner include; Product Design, Development, Test & Integration, Product Verification and Validation. An outsourcing specialist would help the company to develop and implement outsourcing strategies as well and ensure appropriate vendor assessment and management as the contracts progress.

When outsourcing, the Venture should look to build realistic contracts which can both deliver and retain core IP.

Risk assessment and mitigation strategies

The completion of an appropriate risk assessment carried out by experienced product development practitioners, using a proven Risk Assessment methodology, helps to avoid foreseeable problems and overoptimistic planning. This process ostensibly aims to identify and quantify risk on the basis of its size and likely impact. Armed with this information a Venture can plan appropriately and provision the necessary contingency measures. The emphasis of this technique is on risk management rather than risk avoidance.

Examples and case study

Example: A semiconductor manufacturer who was planning to develop a new Mobile Chipset required the development of an architecture since it lacked the necessary in house skills.

The assignment involved the preparation of an architectural information document defining the functionality requirements for a dual mode 3G-GSM chipset family. This allowed a new entrant to the 3G-GSM silicon arena to understand the costs, risks and breadth of technical issues involved. The project required a good understanding and awareness of a broad range of relevant technologies in order to define future roadmaps on which the client's products would be based. This project successfully delivered the client with documented product requirements and architectures and hence they were able to determine whether to move forward to the next phase of funding.

Example: A Cable MSO required the development of an Integration Test Platform, effectively a scale mock-up of their existing network infrastructure, in order to be able to prototype and test new products and services prior to deployment. The contract involved liaising with a number of suppliers to co-ordinate the functional scope of the facility and the design and interface requirements for each sub-system. This project involved a team of 30 consultants and engineers. The resulting test bed enabled the MSO to reduce the incidence of field problems by a considerable margin and hence reduce cost and improve customer satisfaction levels.

Example: A professional services start up required the establishment of a 'Virtual Organisation' in order to provide both a scalable business model with a substantially variable cost model. The Client is a specialist consulting and professional services company serving the European digital interactive TV (iTV) and broadband industries. The assignment was to establish a 'virtual enterprise' capable of delivering the required levels of service to clients. This included the design and implementation of core business processes including a quality management system. The virtual company has allowed the Client deliver multiple projects to first tier OEMs and MSOs with a substantially lower capital requirements than would be typical within the industry.

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More information and offer:

To gain a better perspective on how you could benefit from the application of the techniques described in this article, please contact Andrew Moyler at Intramezzo on 020 7520 9290 or 07803 209391. Additionally Intramezzo is, subject to availability, offering a no obligation free day of consulting to see if LPD can benefit your organisation.

Andrew Moyler is a Director of Intramezzo. He has a strong entrepreneurial background having co-founded three professional services companies and led both management buy-out and trade sales. Andrew has 20 years of experience within the Telecommunications, Digital TV, I.T. and Consumer Electronics industries.