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A new model to evaluate the market for biotechnology

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Abstract

There is a clear need for a tool for market analysis of biotechnology markets. There are many well-respected and well-established models for market analysis but none that meets the specific needs of biotechnology marketing. A new model is proposed here that will transform market analysis for biotechnology. The model is a tool for visualisation of a new biotechnology market through comparison with an existing market that is well understood. It combines parameters identified as specific to the needs of a specialised biotechnology market into a single marketing tool and can be customised to include specific parameters or features relevant to an organisation, its markets or its marketing needs. It has been used to analyse the potential and risks of entry into a new market by comparing it with one that is well understood. Furthermore, by drawing on specialised competitor and market knowledge, it can be used as a strategic planning tool.

Keywords: *biotechnology, marketing, model, positioning, segmentation*

INTRODUCTION

There are many marketing and market analysis tools. These have been developed, in the main, for consumer products and fail to take account of the specific features and needs of the biotechnology industry. There is almost no precedent for analysis of a true biotechnology market.

Established marketing models are valuable in biotechnology marketing analysis. However, even models developed for high-technology industries are, in fact, designed to evaluate a consumer end-user market and so fail to describe and measure the biotechnology market adequately. Whereas even high-technology products are often aimed ultimately at a mass 'high-street' market, biotechnology 'products' tend to be aimed for their entire product lifetime at a highly specialist user with specific needs.

Our recent evaluation of the current and developing market for genotyping products revealed that there are no models available that can be applied directly to this market or to the wider biotechnology market. Furthermore our evaluation revealed that, although valid in describing specific features of biotechnology markets, they have serious limitations in describing fully what is a unique market structure with special needs.

A NEW MODEL FOR MARKETING BIOTECHNOLOGY

It can be argued that every biotechnology market is an opportunity for focus. Each is a specialised market in terms of product and customer needs, and as a result each one requires an individual approach.

The model developed here is a visualisation tool. It enables assessment of a new biotechnology market through comparison with existing markets that have already been well characterised throughout their product life cycles and hence are well understood. The model can be customised to include specific parameters or features that have been found to be relevant to a particular organisation, its markets or its marketing needs.

DESCRIPTION OF THE MCMURRAY–JONES MODEL

The McMurray–Jones model (M-J Model) for biotechnology marketing comprises a set of measurements of:

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Measurement of early acceptance and market growth are essential

- traditional and high-technology marketing parameters;
- strategic planning parameters; and
- features characteristic of biotechnology markets.

Marketing parameters

The life cycle of a biotechnology product follows the profile of a 'fad'

Geoffrey Moore's Chasm, Bowling Alley and Tornado models[1,2] describe a high-technology product moving through its life cycle. Moore describes the traditional bell-shaped, or 'Gaussian' life cycle curve, with product moving from early adopter market through a number of specialised niche markets and then into a broad unsegmented market characterised by high sales volumes. By contrast, the life cycle of a biotechnology product seems not to have the traditional bell shape associated with consumer markets and instead follows the life cycle of a 'fad'.[3]

With the likelihood of a new market having such a limited market life cycle and short product lifetime (Figure 1), it is crucial to be aware of the potential for early growth, in order to take full advantage of its development.

It is crucial to be aware of the potential for early market growth

Market, technology and product 'newness', market features that are recognised in LaPlaca and Punj's Model of Innovative Diffusion,[4] together provide a measure of market growth potential. They assess the readiness of the market to accept the new product, in terms of (a) early acceptance and (b) market growth.

Adoption of a new biotechnology product is dependent on its demonstrable technological advantage over existing products, but also, and perhaps more importantly, on its potential advantage in enabling technological development and progress. A technology may be 'new', in that it is a completely new development and not an incremental improvement over another; however, if the market perceives it as an opportunity for technological advance it will be adopted, thus creating a new market for a new product. Hence, measurement of likely early acceptance and market growth is crucial, particularly within a short product lifetime.

It is vital to recognise the structure of the target market segment in assessing the potential for market development. Percentage commercial activity measures the type of organisation within the market segment. For example, a commercial profit-making company would measure high commercial activity, whereas an academic research group would measure

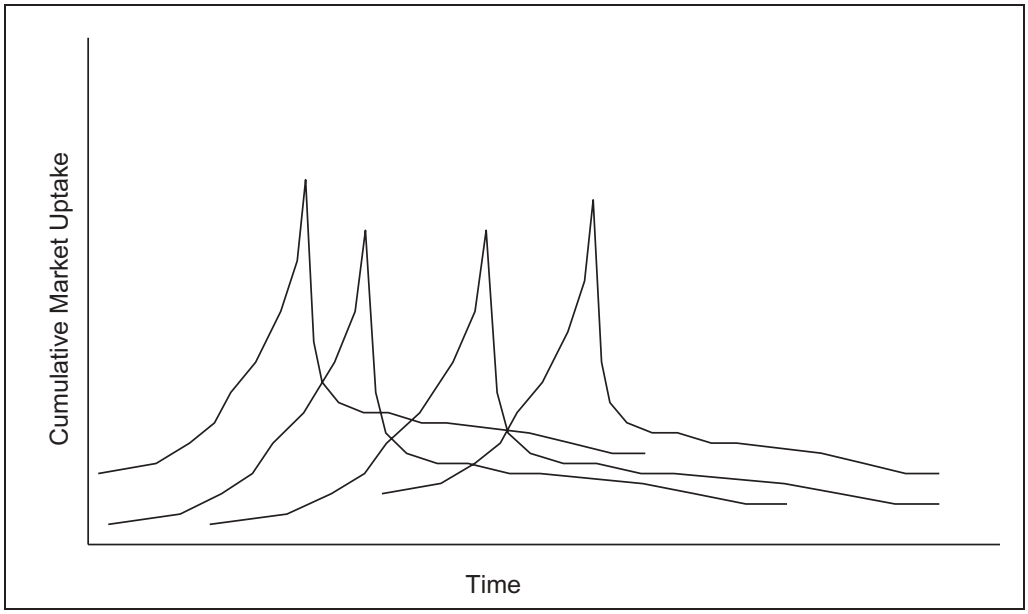

Figure 1: Life cycle of a typical biotechnology product

low commercial activity. This parameter can give information on likely market segment growth.

Strategic planning parameters

It is essential to be aware of strategic threats

It is crucial to be aware of strategic threats. The model identifies two of Porter's five forces[5] as being of key strategic importance in biotechnology markets.

The 'Threat of New Entrants' models the risk, or likelihood, that a new competitor, using a better or cheaper method, will capture the market for the technique. Hence, it models the ease by which a competitor could enter the market and develop and offer the technology.

The 'Threat of Substitution' measures the risk that a completely different technology will prove more efficient or successful, and hence destroy existing markets within a segment, or that new research focus will create new market needs, destroying the need for an existing technology in the process.

Features characteristic of biotechnology markets

Market features specific to biotechnology markets have been identified

Certain market features and forces that are specific to biotechnology markets and marketing have been identified. Measurement of market innovative behaviour and decision-leadership position are crucial in understanding the diffusion of a new technology through the market. Diffusion is fast in a market that is used to new innovation, or in a market that does not have a product that fully meets its needs. Similarly, a market used to adoption of new innovation can be seen as a decision leader, hence diffusion into such a market will be fast, at least in the early stages of adoption. The model incorporates these features for complete analysis.

Features of the M-J model

The M-J model assesses the market for a new biotechnology market by comparison with existing markets

The M-J model is a visualisation tool, which enables assessment of a new market for a new biotechnology product by comparison with existing markets, where customer, sales, marketing and competitor information over the product lifetime has been compiled into a complete market analysis. It draws on the understanding of how existing markets have developed to enable a prediction to be made as to how a new market might grow and develop.

The model is customised for the specific market of application, by selection of key market parameters to be applied to the model spokes and can be further customised to include specific parameters or features that have been found to be relevant to a particular organisation, its markets or its marketing needs (Figure 2).

It is anticipated that an organisation with a detailed understanding of its own markets might identify additional parameters, possibly specific to those markets, which could be included in the model to enhance its representation.

A new market, once analysed, can easily be compared with other products in the portfolio, or to other market segments that have been analysed using the same parameters and interpreted through extrapolation back to sales and marketing data. As new products are developed, marketing strategy can be customised to fit successful patterns and to avoid patterns that represent failure. Equally, experience from markets with similar patterns can be easily identified and applied.

The model is designed to be comparative rather than empirical, but may be quantified, should marketing needs require, by scoring each parameter on a scale of 1 (low) to 10 (high) (Figure 2).

CASE STUDY: APPLICATION OF THE M-J MODEL TO ASSESS THE MARKET FOR A NEW GENOTYPING PRODUCT

The market for genotyping products

Key parameters selected for the market for a new genotyping product were derived

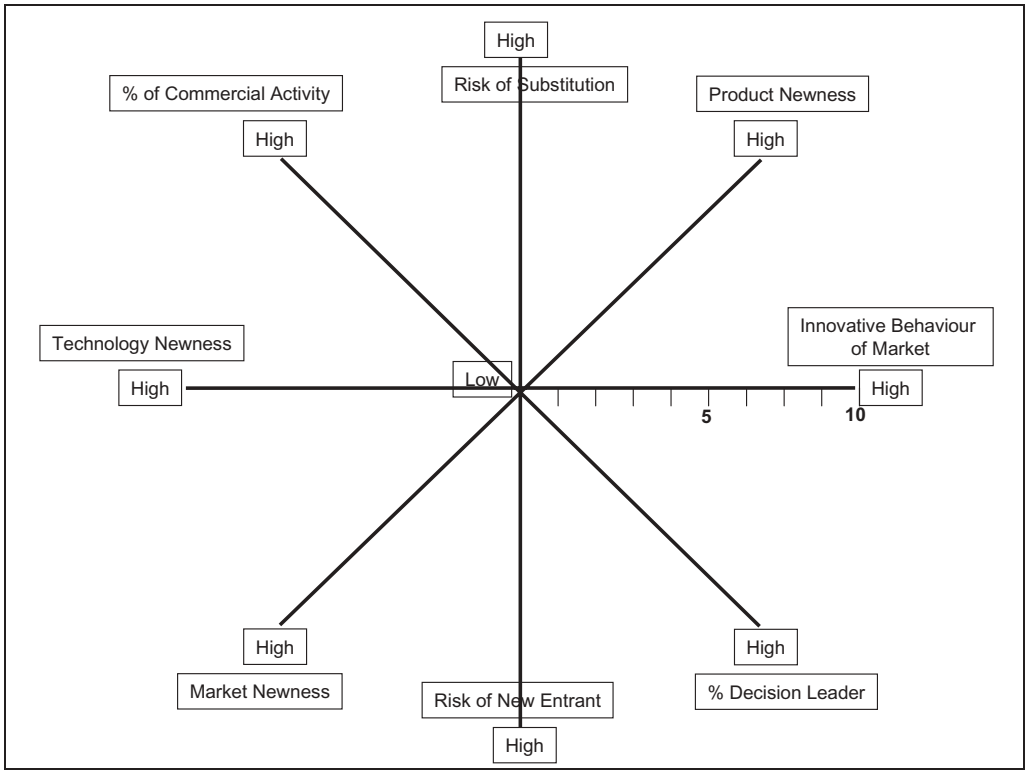

Figure 2: The M-J model

through analysis of existing markets and knowledge of their development and scored between 'low' and 'high' (Figure 3a) for the specific application.

Connection of the scorings (Figure 3b) enabled visualisation of the market pattern, which was then compared to a well-established and well-quantified related market: the market for DNA sequencing products.

The M-J model was tested on the market for DNA sequencing products

Confirmation of the model by application to high-throughput sequencing products

The model was applied to an existing and well-characterised market – high-throughput DNA sequencing (Figure 4). The market for DNA sequencing is well established and the method is a 'gold standard'. The result of analysis can therefore be related back to existing and extensive knowledge of the market, its development and its customer base.

Comparison of the market for a new genotyping product to the market for high-throughput sequencing products

Comparison of the market for a new genotyping product with that of high-throughput sequencing products by overlaying one on the other (Figure 5) clearly shows similarities and differences which may be key in formulating a marketing plan.

Similarities

Comparison of the two markets shows that the new product is aimed at a market that is similarly innovative to the sequencing market, with high decision-making ability. This indicates that it might be expected to be easily and quickly adopted, despite being a completely new technology.

Differences

It is important to note that the product is aimed at a completely new market: whereas the sequencing market is highly commercial, the new product is likely to be taken up by not-for-profit and research users. It is unclear whether the market will develop fully but it is clear that, should it show signs of doing so, it will be competitive, having low barriers to new entrants and to substitutions.

Marketing strategy should therefore be

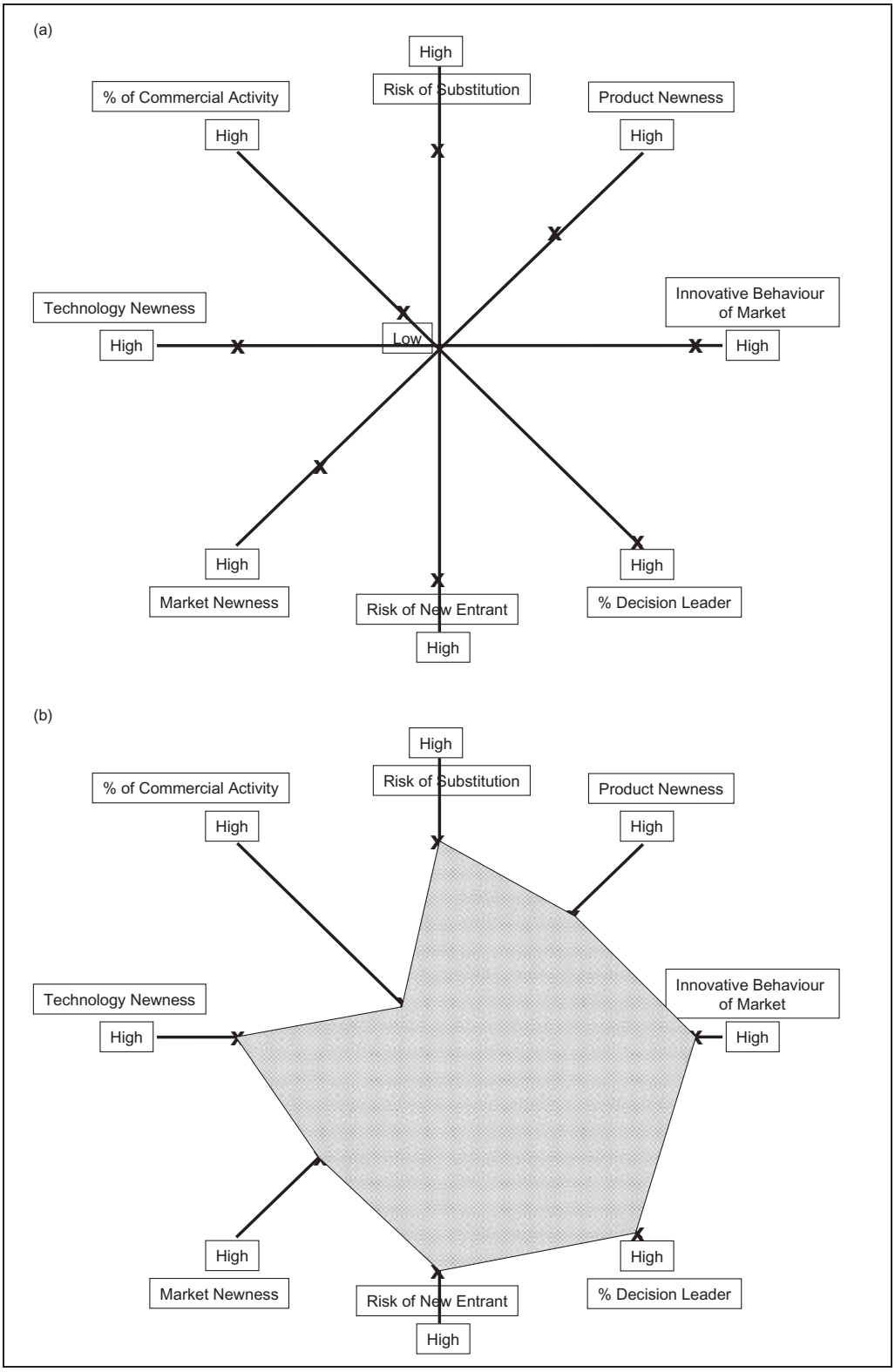

Figure 3: (a) Application of the M-J model to the market for a new genotyping product. (b) The complete market pattern for a new genotyping product

developed to take account of both the similarities with the sequencing market and also the significant differences highlighted by the model.

RISKS ASSOCIATED WITH THE M-J MODEL

The M-J model relies on the quality of the research and market analysis

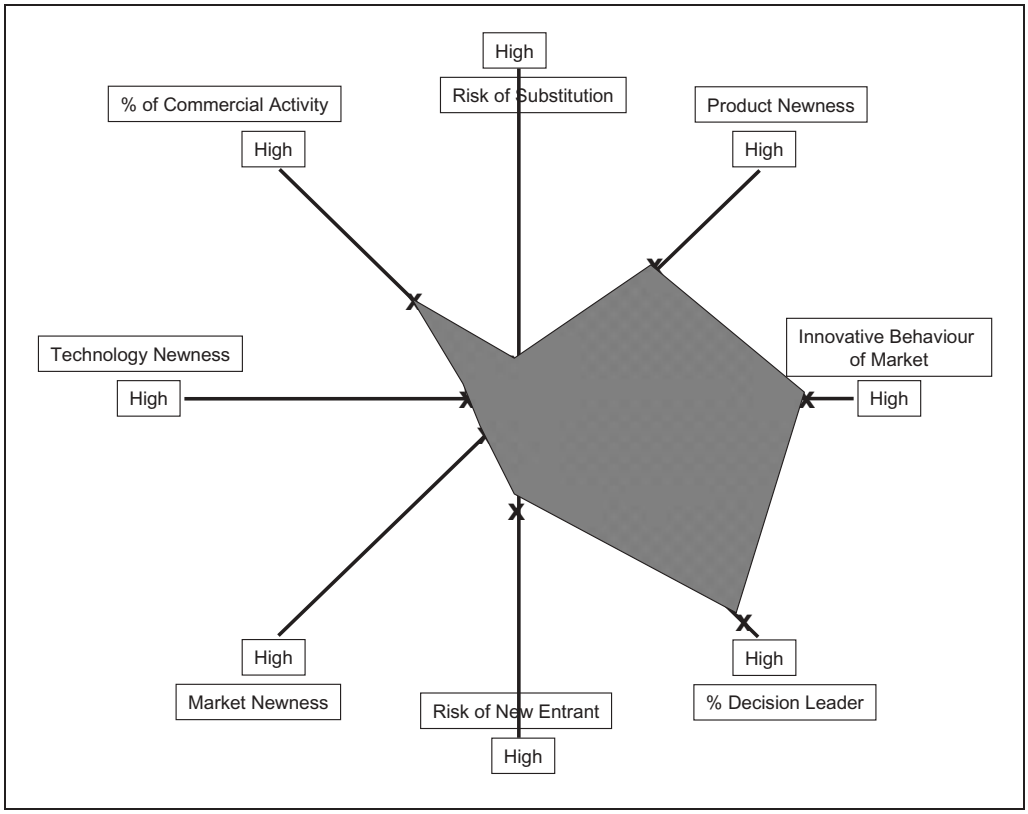

Figure 4: The market for DNA sequencing products

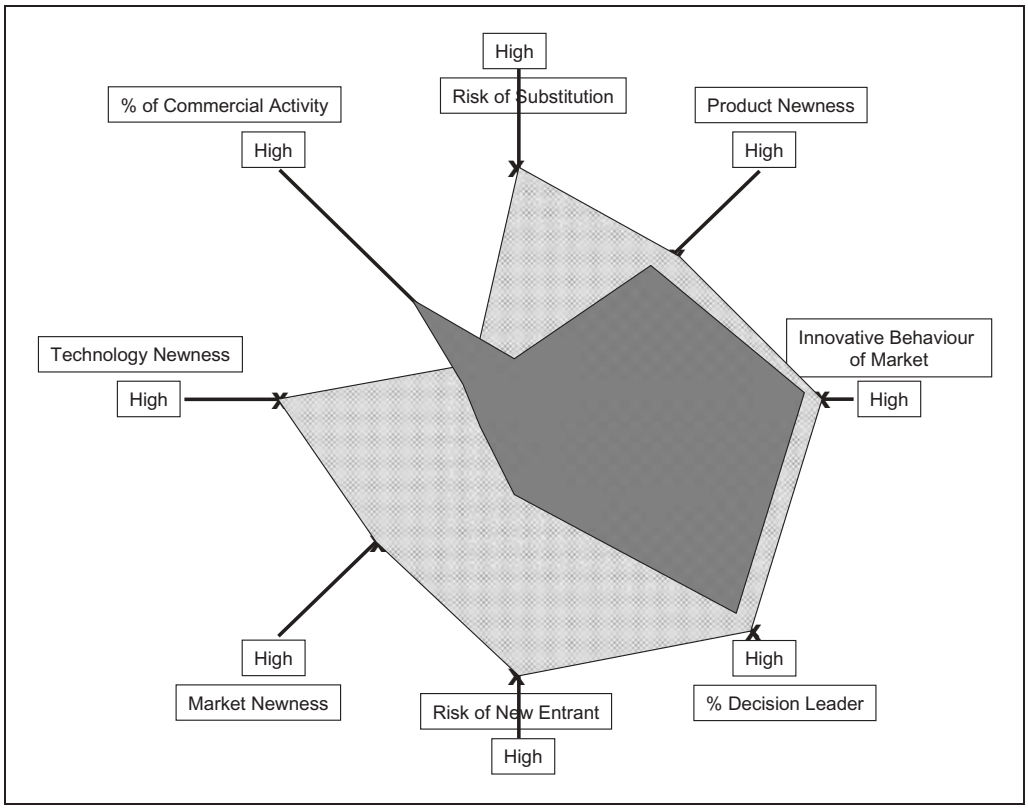

Figure 5: Comparison of the genotying and high-throughput sequencing markets

The M-J model requires high quality market research and analysis for success

underlying it. Poor market research design inevitably leads to collection and analysis of invalid data. This can lead to subjective rather than objective analysis of the market and poor model design and hence could result in misleading interpretation of results.

The model will be evaluated and developed further by application to other biotechnology markets, in order to assess its full potential and limitations.

CONCLUSIONS

The limitations of current market models of high-technology and related markets have been demonstrated. A valuable new way of conceptually viewing a biotechnology market has been developed and presented in order to understand it more fully. This will enable more extensive understanding of a market, the forces operating within it and the opportunities and risks in exploiting it.

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