



CIMA

Chartered Institute of
Management Accountants

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Garden designs to improve the line of sight

Implementation of the balanced scorecard and
an alternative costing system at the Royal Botanic
Garden Edinburgh

Research executive summary series
Volume 6 | Issue 7



Royal
Botanic Garden
Edinburgh

Key findings:

- Just as strategies are specific to an organisation, the balanced scorecard (BSC)/strategy map can and should be adapted to suit an individual organisation to leverage the full power of the BSC system.
- The effort and commitment required from senior management involved in transforming strategy management processes should not be underestimated as individuals/departments will become more accountable for their actions, particularly in the public sector, and resistance to change may be experienced as a consequence.
- If an effective costing system is developed, such as the one described in this report, management will see how their staff are directing their efforts, particularly important in knowledge based organisations.
- With their intimate knowledge of the organisation, the management accountant is well placed to become very involved or direct the transformation process to manage strategy execution leading to improved effectiveness/profitability of the organisation. In this way the management accountant becomes more of a strategic partner to the business.
- The research relates primarily to the practitioner who should find it helpful as the work is based on research subject to academic rigour but is translated into a pragmatic approach via the case study; thereby demonstrating its usefulness to a real organisation.

Acknowledgements

The researchers would like to thank CIMA's General Charitable Trust for funding this project. We would also like to thank Naomi Smith, Kati Kuusisto, and Kim Ansell of CIMA for their assistance.

Project overview

This project investigated whether a strategy framework such as the Balanced Scorecard (BSC) (linked to a Performance Management System (PMS)) compared to a more standard model of strategic planning would improve focus and research output by botanic gardens worldwide. The focus of the project shifted as the opportunity arose to develop an objective costing system linked to the related PMS which allowed the researchers to posit that the BSC framework could provide a more effective contribution to governance. The research output was based on an in-depth case study at the Royal Botanic Garden Edinburgh (RBGE) employing documentary analysis and action research techniques. A brief summary of RBGE is outlined at appendix 1.

Objectives

Strategic planning is an organisation's process for formulating and defining the strategy or direction, and making decisions on allocating its resources, including its capital and people. This project now aims to answer the following questions:

- Can public sector organisations benefit from a strategy formulation framework tool?
- Can the BSC framework/strategy maps be adapted for public sector and not-for-profit/charity use?
- Can the BSC/strategy map system combine with an alternative costing system improve strategic governance?

Main findings and their implications

Introduction

Is the BSC a suitable strategy management and governance tool for public sector organisations such as botanic gardens; if so, could the emerging principles be applied to similar types of organisations? This will be tested in the follow-up phase.

Governance

Governance is defined by IFAC/CIMA (2004) as *'the set of responsibilities and practices exercised by the board and executive management with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are managed appropriately and verifying that the organisation's resources are used responsibly'*. In short, management control is necessary if the strategy is to be executed successfully. Organisations will find it difficult to manage all goals contemporaneously and must focus on achieving their main objectives. Lorsch (2002) stated that *'if directors were getting a BSC, they would be much more likely to be informed about their companies on an ongoing basis. The scorecard's emphasis on strategy (linking it to all activities, day-to-day and long-term) could help directors stay focused.'* The BSC could, therefore, be effective as an element of strategic governance.

Strategy formulation

Chandler (1962) wrote that strategy formulation is *'the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out those goals'*. Johnson and Scholes (1999) suggested that decisions involved in developing a strategy were organisational, economic, and social and *'likely to be complex in nature, made in situations of uncertainty and are liable to demand an integrated approach to managing the organisation'*. Strategic planning involves analyses (e.g. SWOT, PESTEL) and provides the basis for the acquisition and allocation of resources necessary to achieve the strategic objectives and set priorities. Although Mintzberg (1998) criticised *'rational, analytical approaches to strategy formulation'*, as they did not accept that the future can be predicted, and Ansoff (1979) conceded that strategic planning could lead to *'paralysis by analysis'*, Grant's (2008) approach was to emphasise such analytical approaches not because he wished to downplay the emergent nature of strategy but he believed that analysis was a vital input into strategy formulation because the greater the thought and detail that went into planning the greater the chance of the plan concluding as expected.

Of relevance to the public sector is the approach which focused on the organisation's operating environment, the demand for product/services and the current and future technologies that would serve that sector to exploit upcoming opportunities. This approach intuitively required some analysis for strategy formulation and in the research phase we examined whether the BSC could assist with that process.

Structures

Organisational structure can hamper successful strategy implementation as often the selected strategy is the one that best matches the existing structure and, therefore, is past-orientated rather than future-orientated. New strategies may suggest significant changes to the existing structures but this may not be possible for a variety of pragmatic reasons. Where organisations have several output activities requiring integration and compete for limited resources, the requirement for a co-ordinating system like the BSC becomes paramount.

Management accounting issues

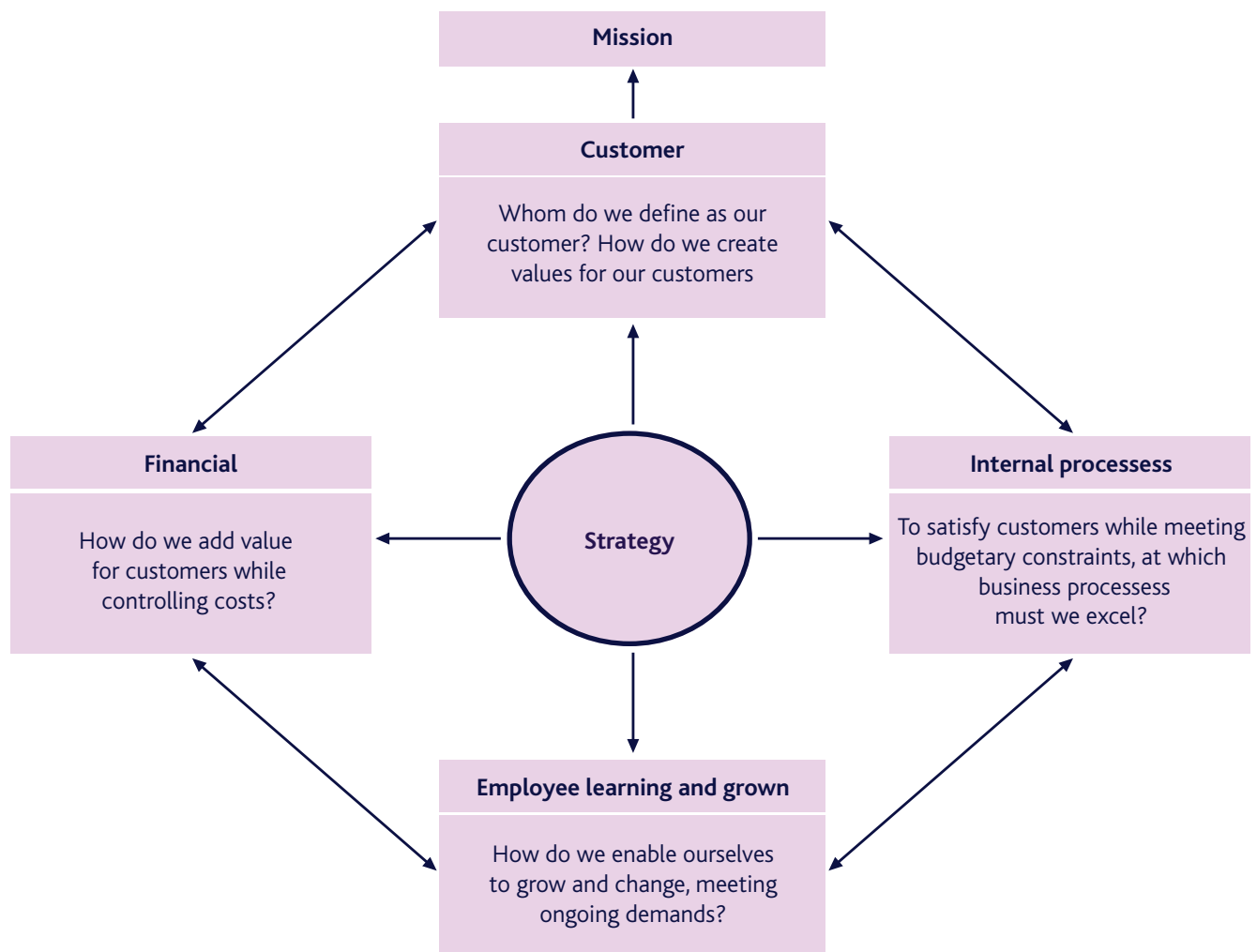
Finance is a limiting factor for public organisations and the means by which resource rationing takes place. The traditional model of management accounting bases its output on the administrative structure of the organisation and its associated cost centres; and performance assessments on cost centre profitability, tight budget management, or cost efficiencies. This raises questions about how effective traditional cost centre management accounting is for organisations whose structure does not follow the strategy. However, even where the primary measures are non-financial there still needs to be linkages to financial information as finance is very often the best proxy for measuring effectiveness of resource allocation. Innes and Mitchell (1998) stated that Activity Based Costing (ABC) identifies the relationship between activities and resources needed by assigning costs to each of these resources, thereby giving visibility to the breakdown of total expense of the activities in their entirety. ABC can be adapted to suit public sector organisations by linking indirect costs to the services provided through activity based cost drivers and which provides more accurate costing of services. The research output on objective costing will suggest an alternative model to ABC.

BSC – public sector

The difference between private and public sector BSCs was determined by placing 'mission' at the top of the framework and connecting the 'customer perspective' directly to the 'mission'. Niven's model (shown in figure 1 on page 3) revolved Kaplan and Norton's model around its axis without further adaptation but other scorecard practitioners recognised the need for alternatives to the original BSC framework to reflect differences among organisations in their structures and environment. Adaptability is possibly the BSC's strongest attribute and perspectives should be selected to fulfil the needs of the particular organisation. Marr (2009) ascertained from his research of both public and private sector organisations in the UK that where adaptation occurred the BSC proved more effective in assisting organisations understanding and executing their strategies; in other words triple-loop learning would occur. Therefore, an organisation needs to consider what perspectives and associated objectives adequately describe its strategy to fully utilise the power of the scorecard.

Cascading the BSC ensures that exchange of information occurs throughout the organisation and that lessons learned and emergent strategies are passed up and down the chain of command. This requires scorecards to be produced for every level of the organisation. These must be aligned up and down and between organisations where applicable if strategic alliances are in existence.

Figure 1: Balanced scorecard for the public and not-for-profit sectors



Source: Paul R Niven, *Balanced Scorecard: Step-By-Step for Government and Nonprofit Agencies*, John Willey & Sons, Inc: 2003, page 32

Strategy maps

Kaplan and Norton (2004) identified the need for a system that presented information showing cause and effect linkages to aid understanding by all stakeholders. Strategy maps present graphically the principal objectives, within selected perspectives of the BSC, contained in an organisation's strategy and show how one objective drives another to achieve the strategy in an integrated and cohesive manner. Strategy maps are equally applicable to public sector and not-for-profit organisations and permit employees to see how their own activities fit into the overarching strategy. Earlier discussion touched on the issue of structure and strategy, and how difficulties can arise if the structure is not

set up to follow the strategy. The cascaded strategy maps can assist with this issue if there are objectives to be achieved by staff in more than one division. These must be shown in each of the cascaded strategy maps so that staffs can report on progress, avoiding the need to engage in expensive and inconvenient restructuring exercises. Consequently, there must be linkages from the cascaded maps to the corporate map and the information abstracted to that level.

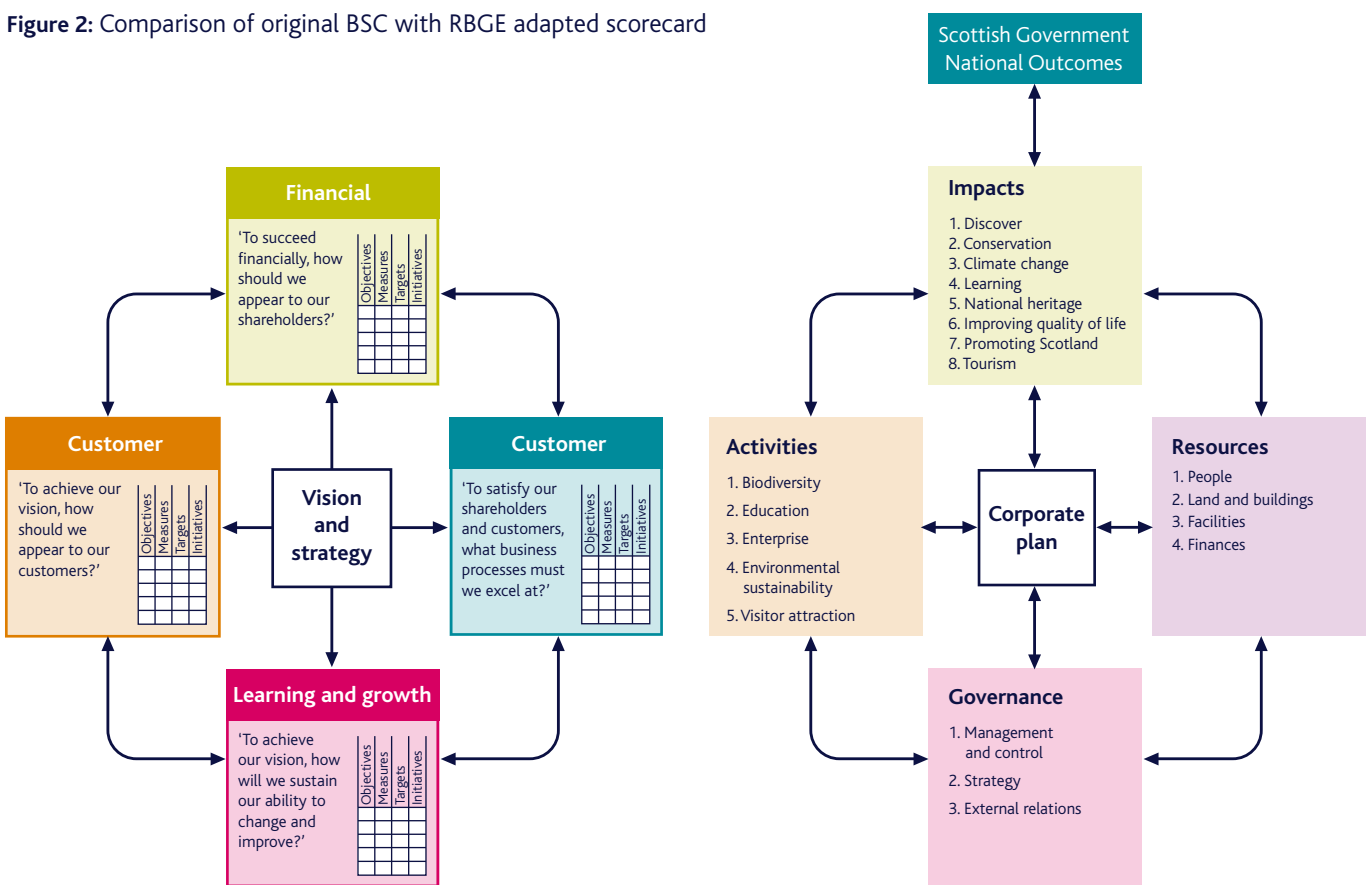
Strategy formulation

The BSC can be modified to suit individual organisational needs. The BSC and associated strategy maps at RBGE evolved over a five year period. The senior management group (SMG) - responsible for, amongst other matters, strategy development - first adopted the BSC in 2004 when they recognised that the RBGE, as a public sector body, existed to provide a service to external stakeholders. The BSC proved a useful tool to answer the 'who, what, why, where, when' questions by using the perspectives within the scorecard; it can, therefore, be argued that the BSC is a formulation tool. At the successive planning conferences

the BSC/strategy map was employed as the basis for strategy and performance reviews and the BSC evolved as a consequence. Figure 2 below shows the Kaplan and Norton's 1996 Model and the RBGE BSC and its perspectives which emerged in 2010 as: Scottish Government's National Outcomes, Impacts, Activities, Resources, and Governance; the strategic objectives are shown within these perspectives.

The RBGE strategy map, figure 3 (2010) overleaf is based on the BSC in figure 2, below. The earlier versions of the strategy map (2006 and 2008) are featured in the appendices (2 and 3) on pages 13 and 14.

Figure 2: Comparison of original BSC with RBGE adapted scorecard



Source: Robert S Kaplan and David P. Norton, *Translating Strategy into Action: The Balanced Scorecard*, Harvard Business School Press 1996, Page 9.

Figure 3: RBGE strategy map incorporating main external stakeholders

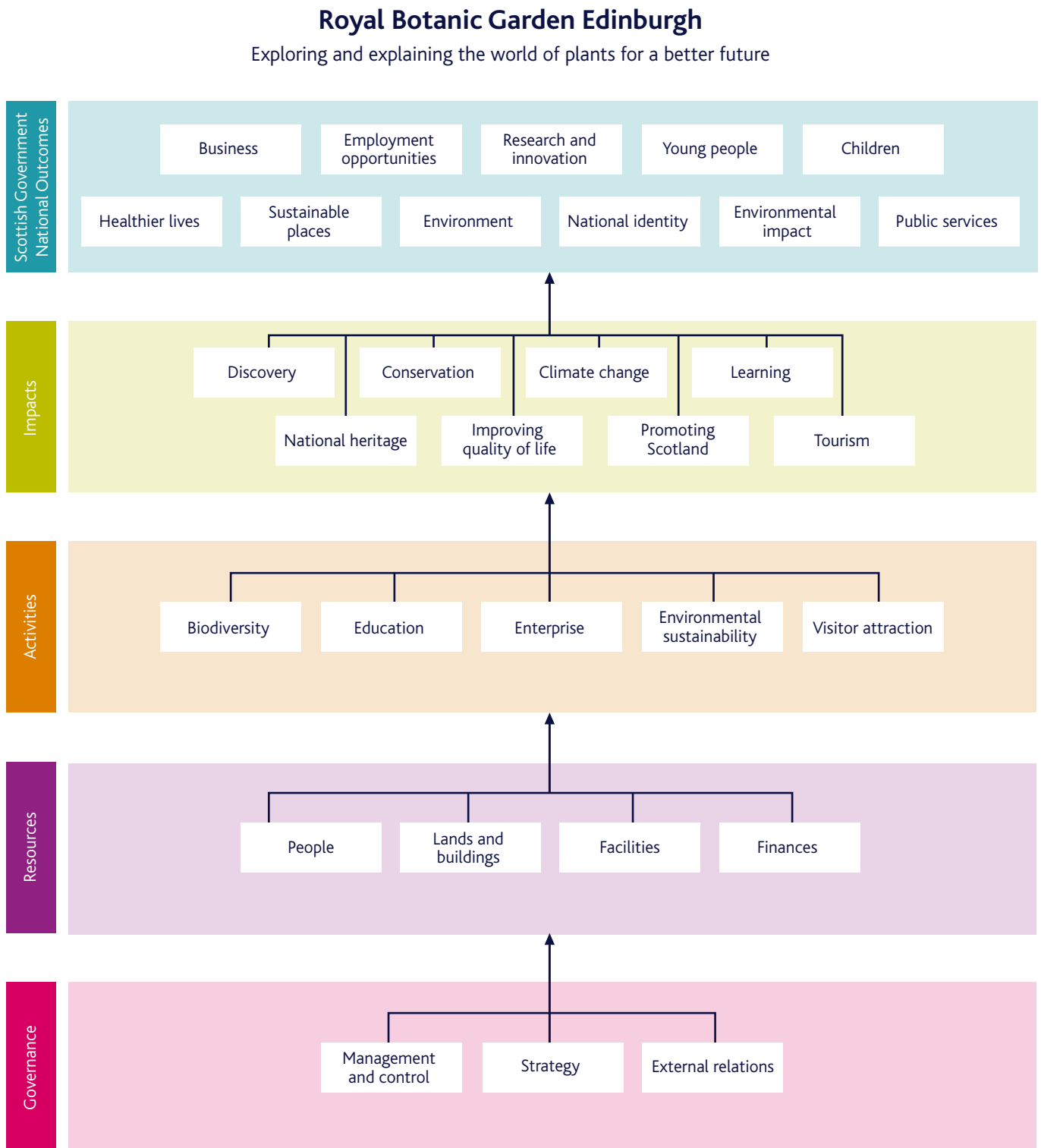
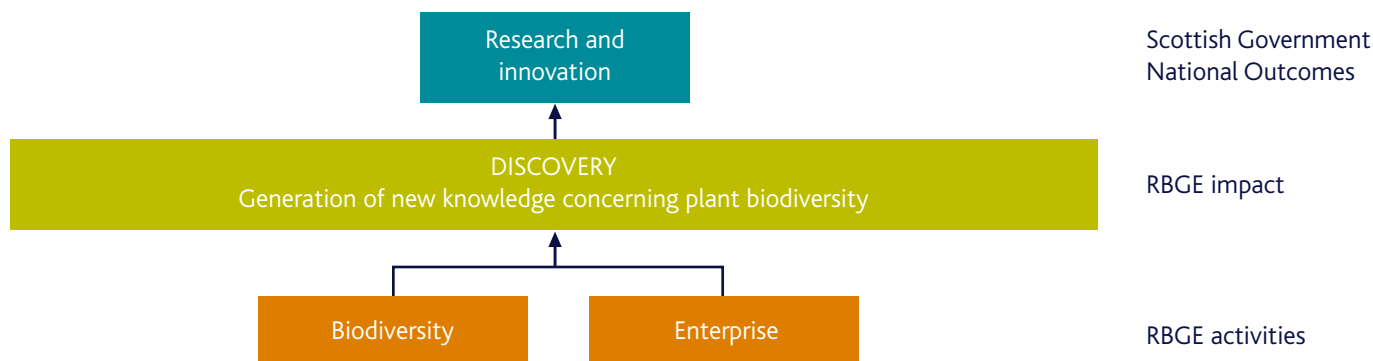


Figure 4: Example of an RBGE impact's 'cause and effect' linkages as depicted in the corporate plan.



However, it was the prospect of the strategic review by an international peer group (similar to university research assessment exercises) that really focused the group's mind on radically revising the perspectives and strategic objectives. There was also an imperative to show clear alignment to Scottish Government's National Outcomes. Although the strategy was based on the revised BSC and provided a relatively straightforward view, the alignment to the RBGE's 'impact' perspective from the 'activity' perspective required additional effort. The result of this work is shown in the RBGE Corporate Plan 2010/11-2014/15¹. Figure 4 above provides an example of detailed linkages:

Risk profile

The risk profile attaching to these strategic objectives is contained in a risk register but a version of the strategy map is used for graphic presentation so that the board/SMG can identify those strategic objectives facing high risks requiring immediate attention (see appendix 4).

Software selection

Several software solutions that supported the BSC were examined for suitability and the Executive Strategy Manager™ (ESM) from the Palladium Group was selected. The attractive component of this software solution was that it has a strategy map interface which could drill down to objectives, measures and initiatives at corporate and divisional level (cascaded) and used the Red Amber Green (RAG) traffic light system of visual alerts. This had the advantage of presenting a view of the strategy map with which staff had become familiar in the corporate plan. The performance analysis is supported by quantitative data, narrative explanations, cause and effect linkages and their impact on the achievement of the objectives. The ability of many staff to input data permitted a much wider engagement in developing/formulating, supporting/reporting

on strategy progress. The main challenge of such systems is the need to consider what information is required, time invested in the system design, providing training in its use to a large number of staff, and investment in management commitment. These processes, if successful, overcome many criticisms, including a lack of causal linkages and an overly top-down approach, raised by some well respected writers. At the offset considerable input was required from staff but this produced an over-complicated system of measurements as individual contributions were fully reflected in the design. Valuable lessons were learned and a second, more streamlined, version is being produced in early 2010. Examples of the earlier outputs obtained from the software system are shown in appendices 5-9.

Objective costing

Cost centre costing/ABC may be adequate for organisations which deliver strategy through cost centres but does not account so effectively for the costs to organisations where staff work cross-divisionally and in cross-cutting themes. What may be of more interest to senior management is to discover where the real efforts of employees are focused. This information and the costs of each of the strategic objectives may be more useful than attempting to allocate all overheads against the output activities. Decisions may require to be made about where to direct efforts to maximise efficiencies and effectiveness and it will be necessary to use financial terms as a proxy for comparison and/or redirection of effort. Consequently, a different model is required to capture the time and costs that these staff put into the various activities that contribute to the execution of the corporate strategy. None of the RBGE systems for managing performance, finance, or HR were set up to deal with this requirement and so a novel approach was developed. Each activity being measured as part of ESM had a unique code and was structured to follow the objective coding system;

¹ <http://bit.ly/9P7cy4> link to the RBGE corporate plan

initially, there were some 350 different activities being tracked. The finance system was amended to demand two codes: one for the traditional cost centre systems necessary for producing financial accounts, and a second code to allocate costs against a departmental activity. The HR system was developed to include a time allocation system

that collected either actual hours spent on activities or a percentage of working days on the range of activities that individual staff members were expected to complete. A screenshot of the time recording system is shown in figure 5 below.

Figure 5: A screenshot of the time recording system developed for the RBGE

Royal Botanic Garden Edinburgh

Weekly percentage – Screen – – Webpage dialog		X
Weekly percentages		824015074 – Alasdair Macnab
Weekly beginning	25/10/2009	
Completed activity sheet		
MDACMOL1 – Review/Revise the Performance Management		0
DACM04 – CSD Management		25
IP025 – Benmore Fernery		0
TRAINING – Meeting internal and external training courses including College, University and Continued Professional Development		0
MCCM01.2 – Corporate plan		35
MDACM02.2 – Health and safety		
MDACM02.3 – Risk register		
IP022 – Edinburgh Gateway		
LEAVE – Leave of absence (including annual, public and privilege, flexi, TOL, special, maternity, paternity, parental adoption and career breaks)		
MDACM03 – Profile raising activity		0
SICK – Sickness absence		0
MDACM02.1 – Business Continuity Planning		0
DAFM01 – Manage Capital Plan		10
MADCM01.1 – Resource Management Plan		0
DACM05 – RBGE Management		30
MOC01.3 – Deliver Resources for Corporate Governance to the Board - Other		0
MR05.4 - Increasing Income		0
MOCM01.1 – Board Papers		0
		0
		0
		0
		0
		0
		0
		0
		100

Although staff could opt to complete the online time sheet in either percentages or hours the system calculated costs based on percentages of total salary as the staff members got paid the same whether they worked a 37 hour week or a 60 hour week. The additional hours spent was down to the individual wishing to do so and not at the request of management; this situation is not untypical in academic institutions. However, for those staff members who were paid contractual overtime these costs were captured through the finance system. ESM was able to perform a Standard Query Language (SQL) query on the outputs of these two systems (HR and finance), which exported the data into Excel spreadsheets, and allocated both staff costs and non-salary financial costs to the activities being tracked. ESM was also able to abstract that information up the scorecard system to provide costings at the corporate/strategic level.

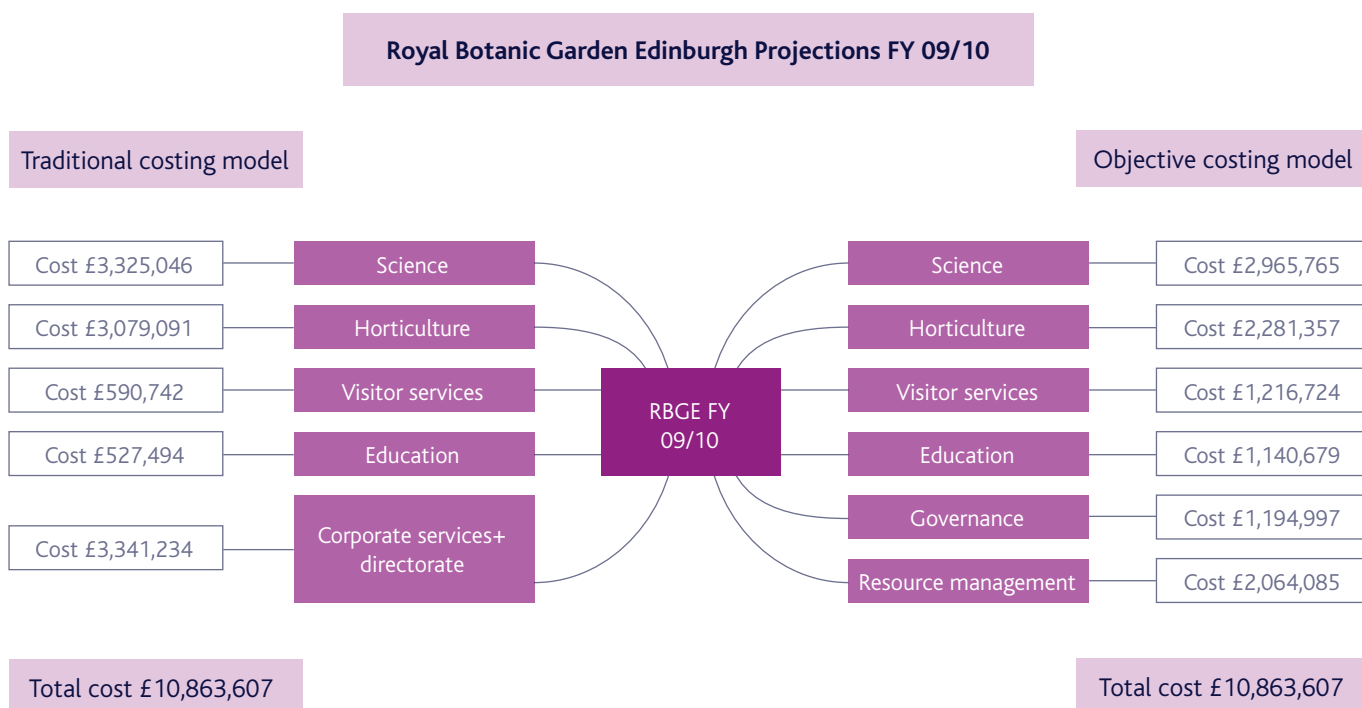
The costing information is capable of being presented at individual activity, departmental level and strategic objective level, and was fed into the activity reports by ESM, which provided visibility of costs/effort to operational managers. This would make it possible for senior management to decide whether the best use of scarce resources was being achieved. Although most staff were homogenous in skill sets within

their own cost centres and, therefore, not easily deployable to alternative employment, there were activities they were engaging in that could cease if greater resource effort was required within their own skills area; e.g. some scientists and horticulturists could cease some management and educational activities. This objective costing system would allow management to consider redeployment of skills/knowledge and assess the impact of such decisions with the subsequent reporting that would take place during the course of the year.

An example of the comparison of the high level outputs from these two costing systems is shown below in figure 6.

The notable costing outputs from this system are science, horticulture, visitor services and education. We can see where staff effort is actually taking place regardless of where the staff sit within the organisational structures (e.g. science and horticulture staff making significant contributions to education and visitor services). If we can determine this information then the issue of structure can be overcome – i.e. we can dispense with the need to change structures to follow strategies if we have aligned sub-unit objectives to the corporate strategy.

Figure 6: Comparison of the high level outputs from these two costing systems



Implementation issues

As is commonly found with implementing new systems there are procedural issues to resolve and cultural difficulties to overcome. The time recording system was a bespoke design and initially proved awkward and inflexible to meet user needs. Once feedback was provided to the developers these issues were resolved; there is 90% usage and given that many staff are in the field this is highly satisfactory. An overcomplicated system was initially developed within ESM due to full staff involvement and this became challenging in some areas when it came to reporting. Consequently, with the significant revision of the corporate plan the programme was modified in early 2010 to provide a more streamlined system capable of producing accurate information at strategic level.

Summary

The BSC was designed to assist strategy execution and provide a basis for performance management. What emerged was that the BSC could help public sector organisations with strategy formulation if appropriate adaptation of the BSC was made to suit the specific needs of the organisation. Each strategic objective could be monitored for its impact on the overall corporate strategy and emerging strategies could be incorporated.

An objective costing system has been developed that is managed through the BSC and supported by bespoke adaptations to the HR and finance management software systems. This will bring together management information on the costs of the contributing elements of the strategy, the linkages between different elements of the organisation and their contribution to strategy execution, as well as a detailed quantitative and qualitative assessment of performance, allowing a more rational allocation of scarce resources; triple-loop learning would occur.

Combined with the application of the objective costing system, the inclusion of compliance reports (management and control objective) the BSC will prove to make an effective contribution of the performance dimension of the strategic governance system at RBGE. It offers a model which may well be beneficially replicated in other public sector organisations.

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Research

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Appendix 1 – The Royal Botanic Garden Edinburgh

The Royal Botanic Garden Edinburgh (RBGE) is a not-for-profit charity, formally titled a Non-Departmental Public Body (NDPB). It is sponsored by the Scottish Government's Directorate for Rural & Environment Research and Analysis (RERAD). RERAD's core purpose is to strive for a 'Greener Scotland.'

The RBGE:

- holds one of the richest living collections of plant species in the world
- has a herbarium of some three million preserved reference specimens from 157 different countries
- has one of the world's largest research groups of plant taxonomists who study all groups of organisms falling within the scope of botany: fungi, algae and all major groups of land plants

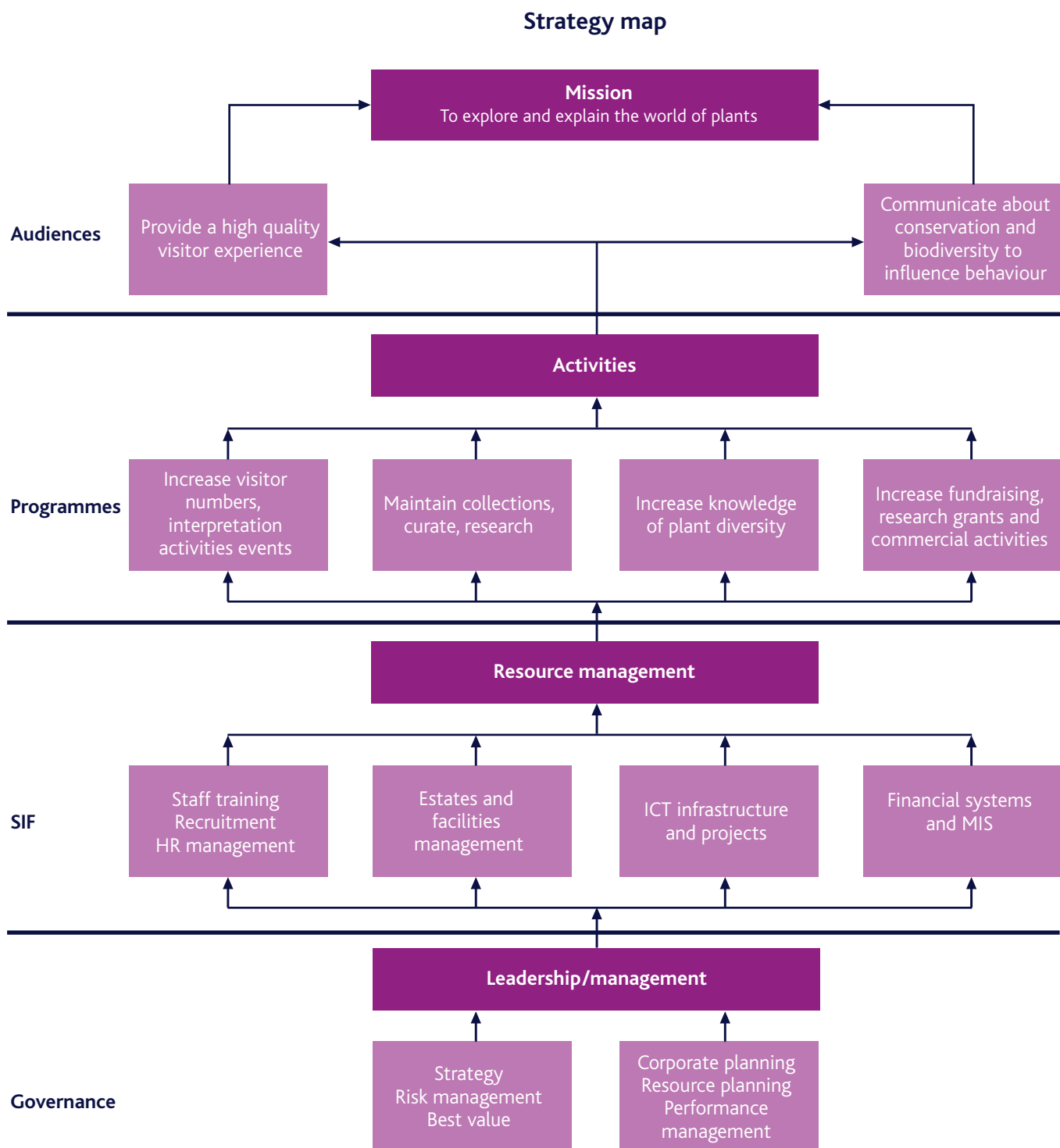
- has the widest educational programme of any botanic garden, and receives some 800,000 visits per annum to its four gardens making it one of Scotland's leading visitor attractions.

RBGE's contribution to the Scottish economy is significantly more than just its direct expenditure. Through expenditure and income effects, it is able to contribute substantially more to the Scottish economy and most of the impact is on the local (Edinburgh) economy. The total output impact of RBGE's operations is estimated at £23 million per annum. This represents the share of GDP attributable to RBGE's operations. This output level is associated with £13.2 million of Gross Value Added (GVA), a government growth measure².

² GVA is the additional value generated by each part of production activity and, here, is equated as output minus intermediate consumption.

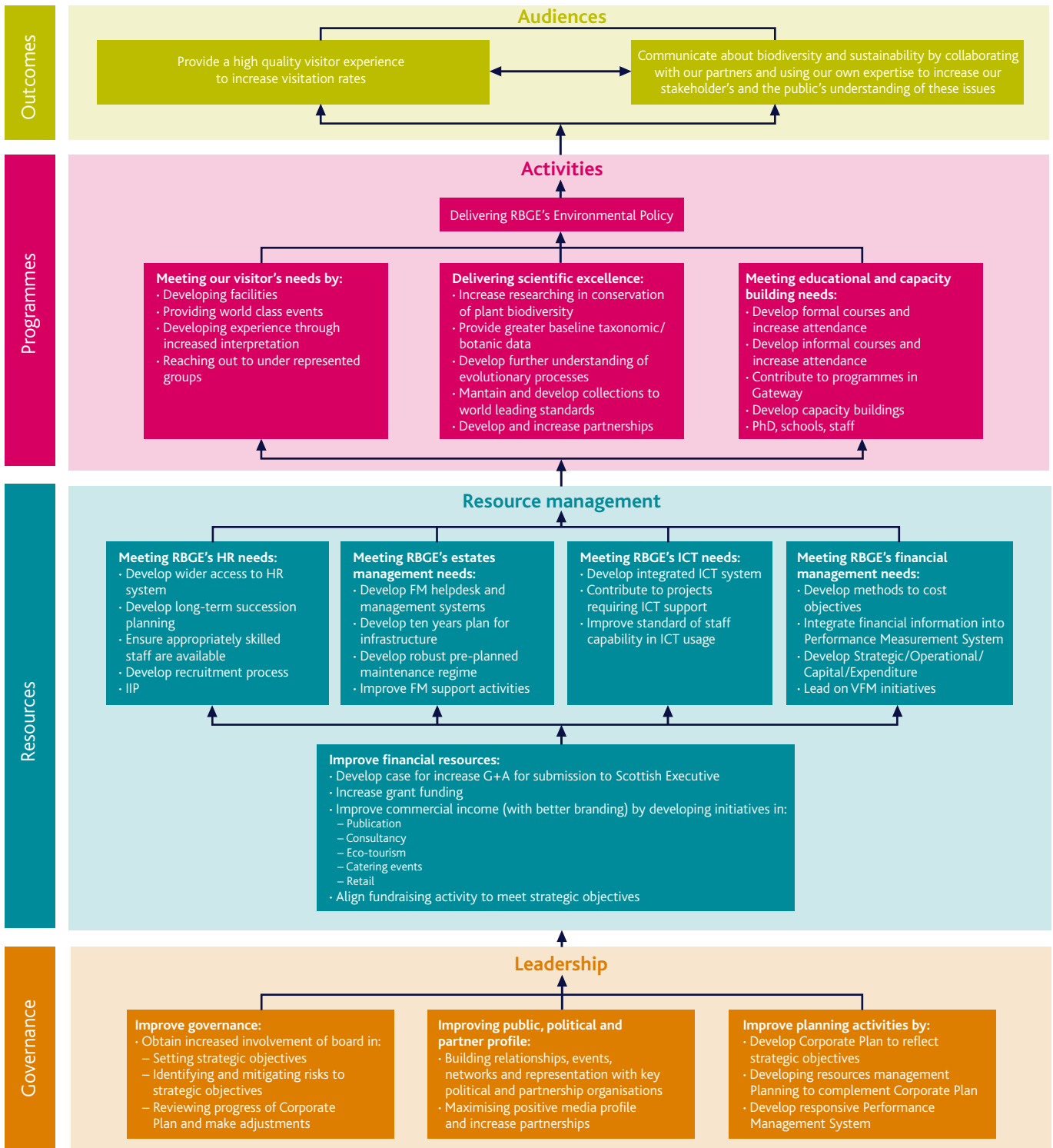


Appendix 2 – RBGE strategy map - 2006



Appendix 3 - RBGE strategy map - 2008

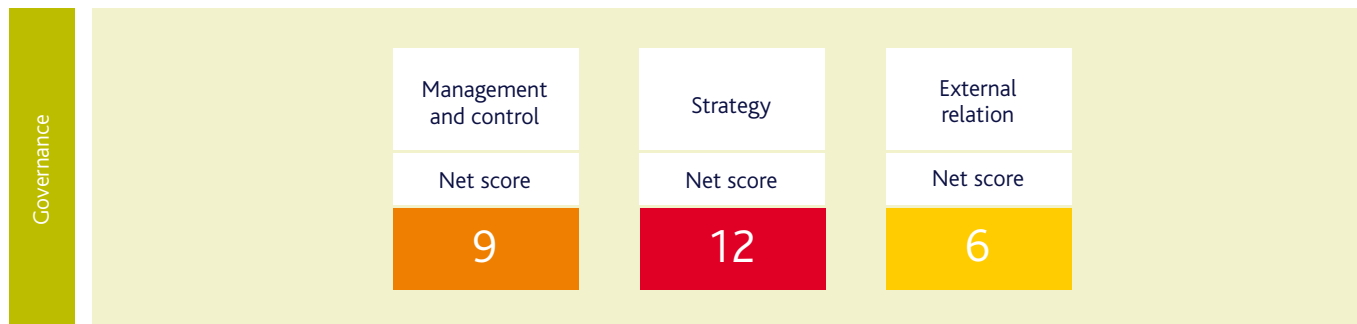
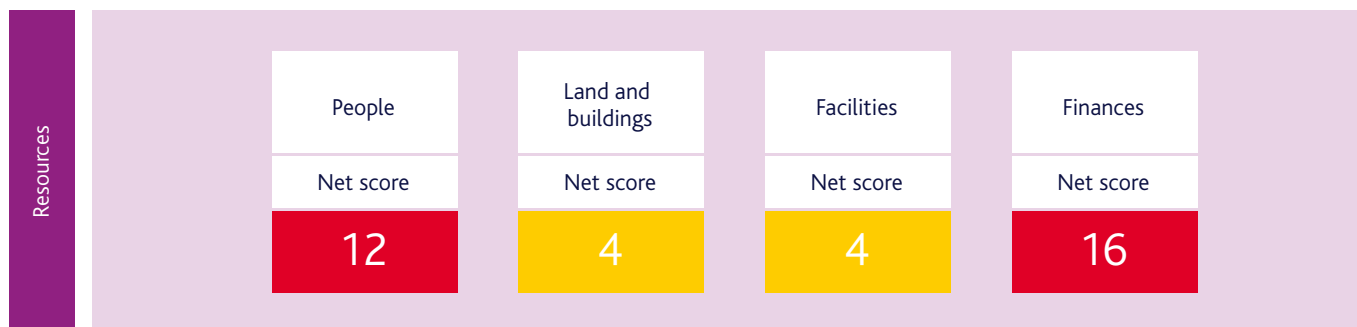
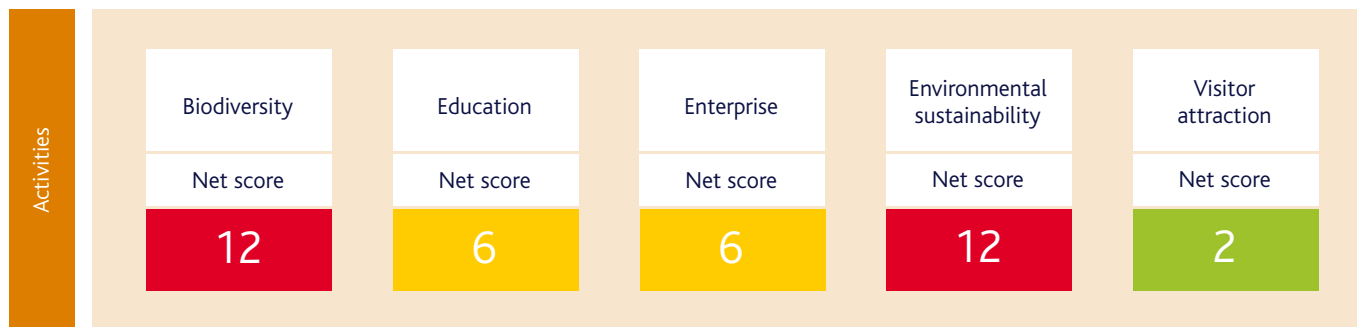
The world is changing more rapidly than ever before in human history. The race is on to preserve biodiversity, to find more sustainable ways of living and to prevent irreversible damage to the global ecosystem. With its dual role as research and education institute and visitor attraction, the Royal Botanic Garden Edinburgh will make a vital scientific contribution and take up the unique opportunity to engage with the public, making them part of the solution.



Appendix 4 – RBGE risk profile map -2010

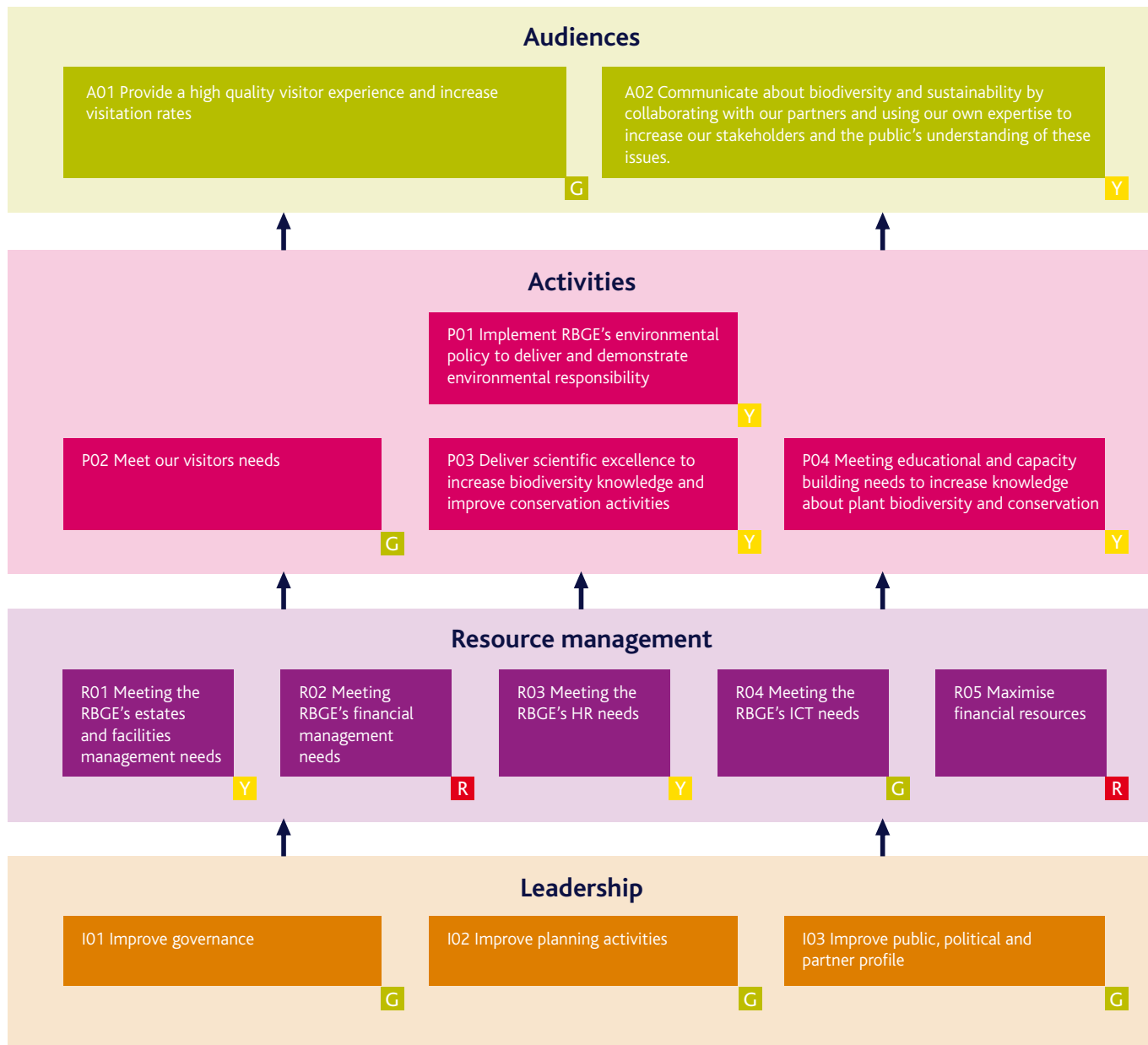
Royal Botanic Garden Edinburgh – risk profile

Exploring and explaining the world of plants for a better future



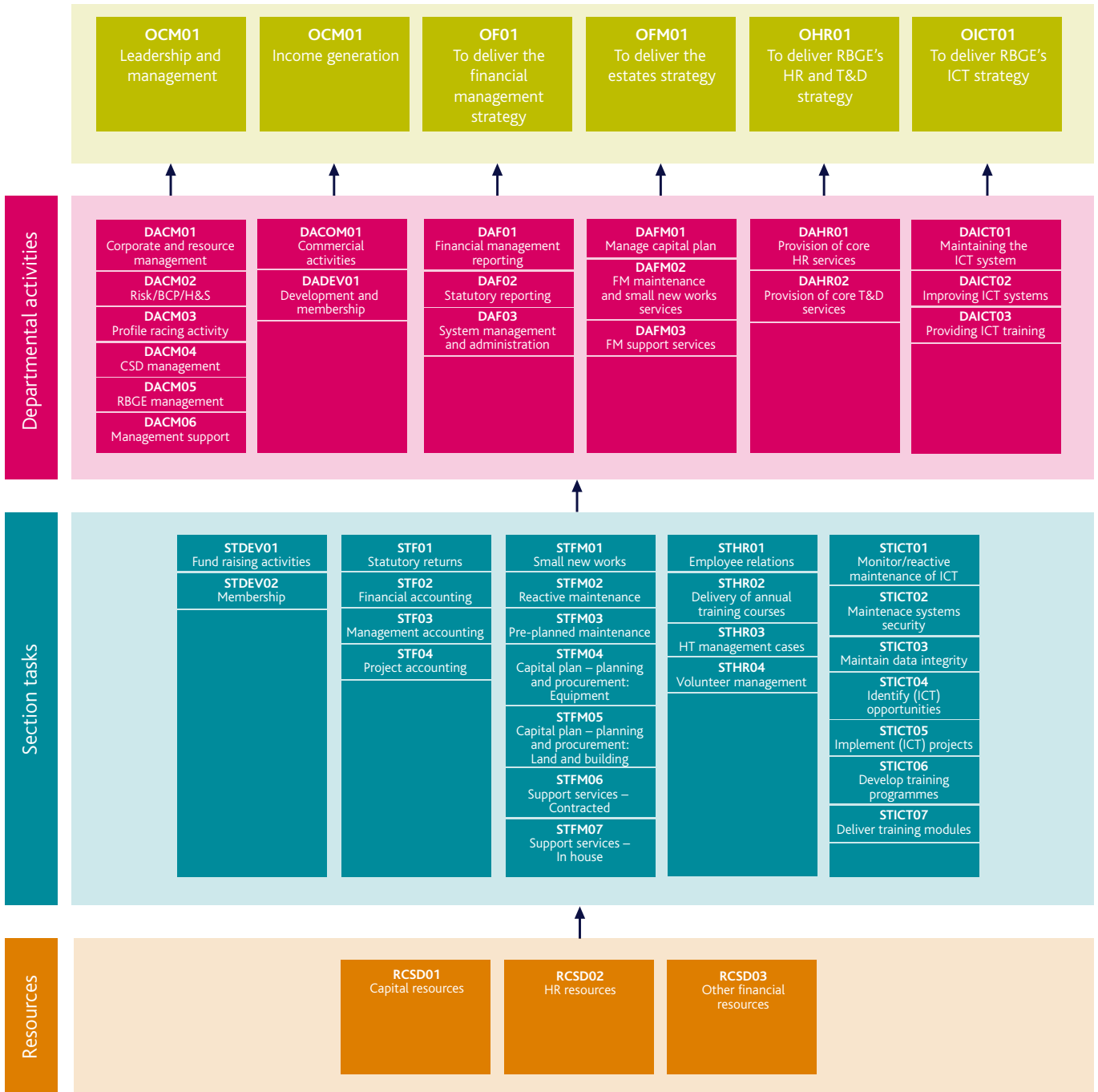
Appendix 5 – RBGE scorecard in ESM

RBGE scorecard



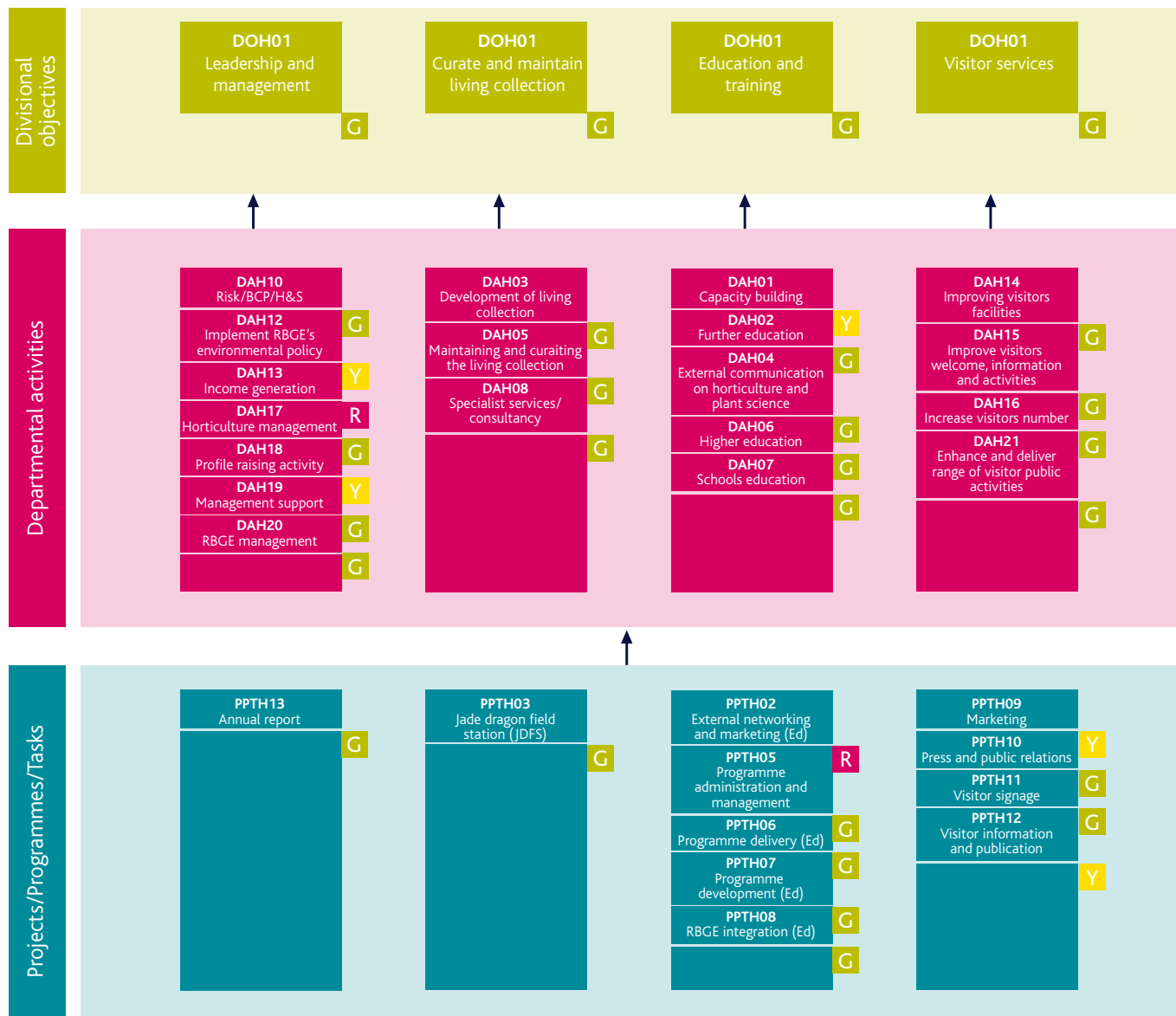
Appendix 6 – Corporate Services Division cascaded scorecard in ESM

Corporate Services scorecard



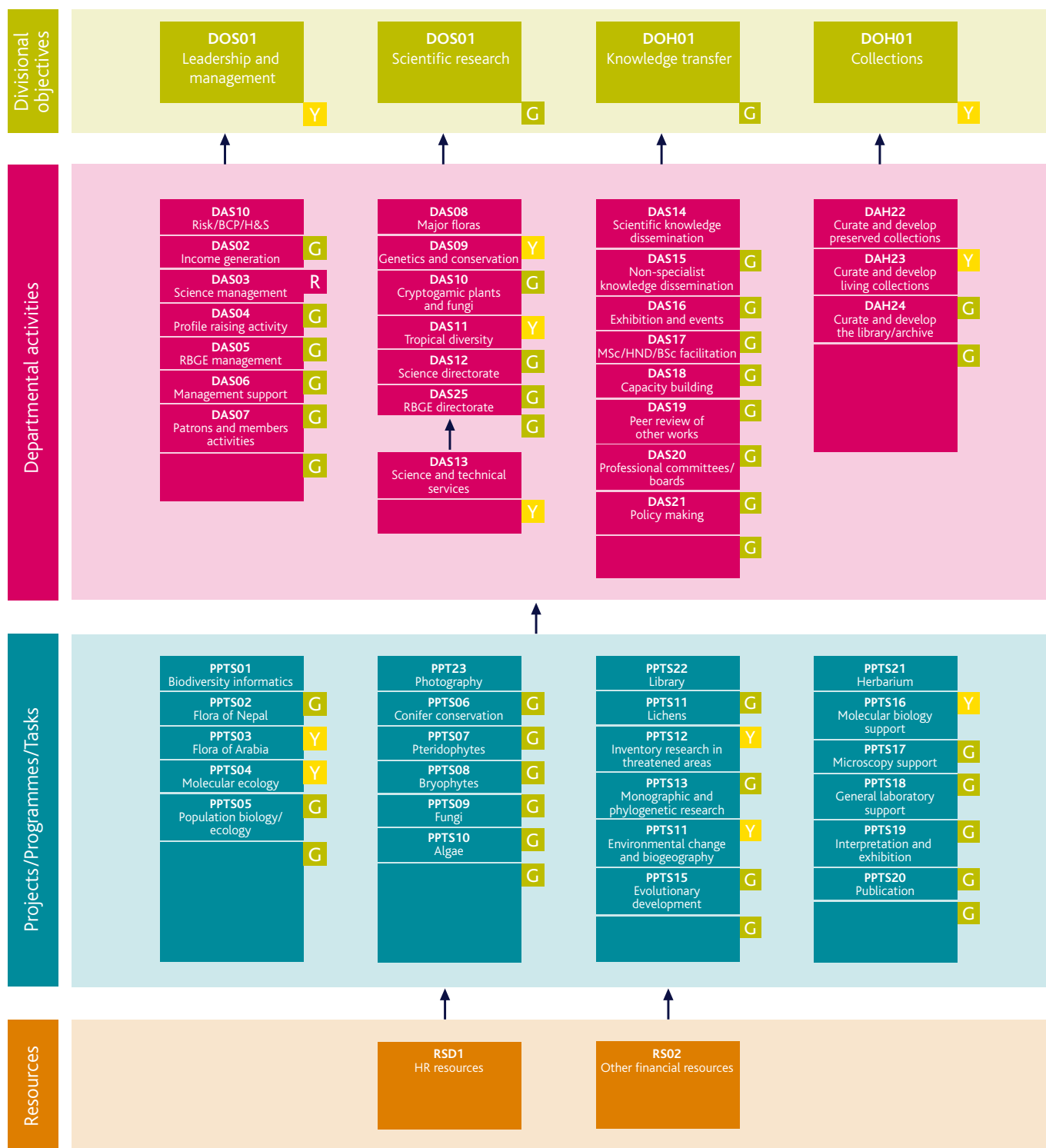
Appendix 7 – Horticulture division cascaded scorecard in ESM

Horticulture scorecard



Appendix 8 – Science division cascaded scorecard in ESM

Science scorecard – divisional objectives



Appendix 9 – Examples of objective reports in ESM

R DACOM01 Commercial activities

Status below plan

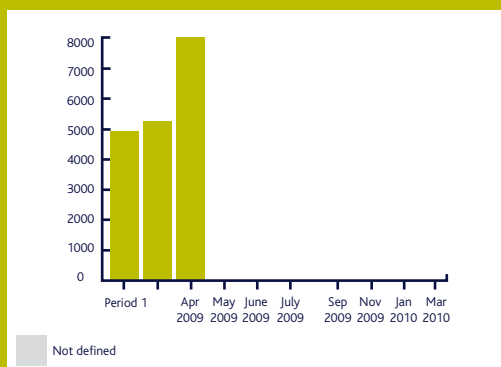
Objective owner:

DH

Objectives definition

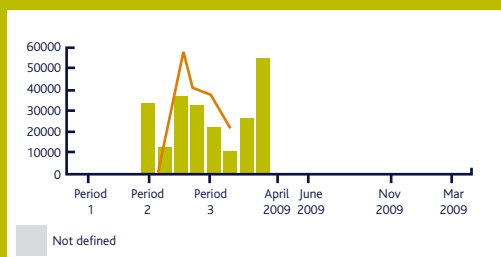
To seek opportunities to generate income from a variety of commercial RBGE sources

DACOM01 activity cost



Not defined

MDACOM01 maximize commercial income



Not defined

Performance analysis

Financial update for commercial (February 2009)

Retail performance for the months

	Actual	Budget	Variance
Dawick	£3,958	£5,000	-20.8%
Edinburgh	£13,564	£20,060	-32.4%
Logan	Closed	Closed	

Almost half of the visitors to Dawick also purchased in the Botanic Shop. The majority of sales were attributed to plants (23%), books (21.5%), gifts (20%) and stationery / cards (20%). E-commerce sales accounted for only £98 of the total Edinburgh sales.

At the Edinburgh shop, the majority of sales were attributed to cards and stationery (20% of the mix), gifts (18.5%) and a garden sundries (9.5%).

Retail performance year to date

	Actual	Budget	Variance
Dawick	£61,846	£69,000	-10.4%
Edinburgh	£245,261	£335,500	-26.9%
Logan	£47,873	£70,094	-31.7%

Retail performance this year/last year for the month, in comparison with visitor attendance

	This year	Last year	Variance	Visitors this year	Visitors last year	Variance
Dawick	£3,958	£2,110	+87.5%	1989	1602	+24%
Edinburgh	£13,564	£13,233	+2.5%	24946	26509	-5.8%
Logan	N/A	N/A				

Dawick managed to achieve an impressive increase in sales compared to last year, whilst Edinburgh managed a modest increase, despite a decrease in visitors of almost 6%.

Retail performance, spend per capita and spend per customer, plus conversion of visitors to customers

	Spend per capita	Spend per customer	Conversion of visitors to customers
Dawick	£1.98	£4.28	46%

Recommendations

Continue to develop new RBGE branded products and review existing merchandise ranges for introduction to retail, prior to the Gateway opening in Summer 2009

Continue to engage with Visitor Services, in particular marketing, to develop initiatives that reach out to new audiences. Work with Events and Exhibitions to identify events with commercial opportunity

Initiatives

No associated initiatives

Attachments

No attachments

Appendix 9 – Examples of objective reports in ESM



PPTS21 Herbarium

Status: Caution

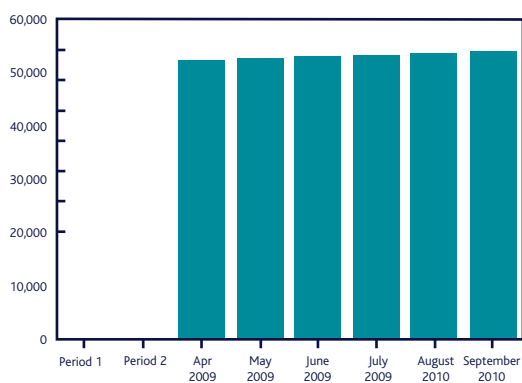
Objective owner::

DH

Objective definition:

To provide long-term institutional and short-term (5-10 year) research-driven curation. We will: 1) carry out general curatorial activities across all collections, 2) collect herbarium vouchers and silica dry tissue samples from the entire living collection, 3) increase the quality of endangered plants conversation collections, 4) integrate subsidiary collections into central database systems, 5) complete the library back catalogue (including archives and collections), 6) secure resources for the establishment and maintenance of a DNA bank. We will: 1) curate targeted material supporting current research and conversation activities, 2) obtain access to e-journals at the Web of Knowledge to support research, 3) undertake phonological observations on the living collections in relation to climate change, 4) undertake historical research on archive material, 5) meet targets and standards set out in the collections policy of the living collection, 6) develop the mapping system integrated with the database of living collections to provide more efficient and effective management of the collections.

MPPTS21.4 Mounting backlog



Below plan

Performance analysis

There is a serious backlog of plants needing mounting at the herbarium- currently this figure stands at 52,000 specimens. This has resulted in the unmounted specimens being unavailable to take part in any RBGE initiatives, for example the recent Mellon funded Digitisation project, and our floristic and monograph activities. I have only one full time mounter and a gapped post. Therefore our current mounting output is only 4000 specimens per year. I estimate that by 2013/14 our backlog will be 70,000 specimens per if we continue mounting at the present rate.

Recommendations

We have had limited success in our grant applications for more funding for mounting, and therefore we need considerable resources from RBGE. We need four full-time mounters to cope with the backlog; will then reduce to 27,000 specimens by 2013/14

Divisional Director's comments

No comments entered

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