5.4 APPLYING GREEN IT STRATEGIES TO THE PACKAGING INDUSTRY

B4Pack is a hypothetical organization in the business of manufacturing packages and containers. This is medium sized industry, that has established itself over the last decade as a reliable, honest organization. B4Pack has around 10,000 workers and corporate board led by young CEO. 4Pack is keen to move forward in the area of Green IT. The carbon emissions from its production lines are on the rise, and also the electronic and other wastages. The wastages, are not just restricted to the organization but are occurring at an alarmingly high rate with

the end-users of the contents of the packages. The local **regulatory authorities are also showing interest in B4Pack's**

carbon footprint. The products of B4Pack include variety of packages that are made up of materials such as cardboard, foam,

plastic, choir, and rubber. These packages or containers are sold to other manufacturers who use them to wrap, store, and distribute their own products, including food medical drugs, equipment, and electronic goods. The containers produced by B4Pack, therefore, need to range from boxes, tubes, and bubble-wraps through to tin cans and jars. Manufacturing of the packages requires materials to be sourced, planning of the production process, inventory of produced packages, and a customer management system.

A recent internal audit revealed that the organization has around 350 desktop machines, close to 100 laptops, and two large data servers in a small, backend data centre. Most PCs have been inuse for 5 or more years, have cathode ray tube (CRT) monitors, and are used by accountants, production shift managers, and administrators. Connectivity for most machines is provided through internal LANs and WANs and externally using a combination of virtual private network and the Internet.

The hardware of the organization is used to run variety of **applications including B4Pack's assets and inventory** management, customer service, financial management, procurement, and HR/Payroll. Data corresponding to these applications is stored in the underlying data warehouse of B4Pack on the two servers. A significant part of the production and inventory data is collected from the shop floor automatically and updated in the data warehouse.

Following are the current observations of the CEO together:

> Raw materials for packaging are available in abundance. There is excessive availability of raw materials particularly from the regions where B4Pack is located.

Workers are dedicated to the company. However, most workers have had very basic education, and in some cases no education at all. While expert in particular production process, these workers had no current interest in Green IT or carbon reduction.

Wide customer base from both developed and developing region with the business from the developing regions on the rise.

Network of transporters who partner with B4Pack to bring in raw materials as well as deliver blank, ready-to-go container packages, typically to the corporate customers.

Continuously changing needs of customers—as their products are changing too.

Other departments of B4 Pack, that are under the direct influence of these changing requirements are sales, financial, customer service and legal department.

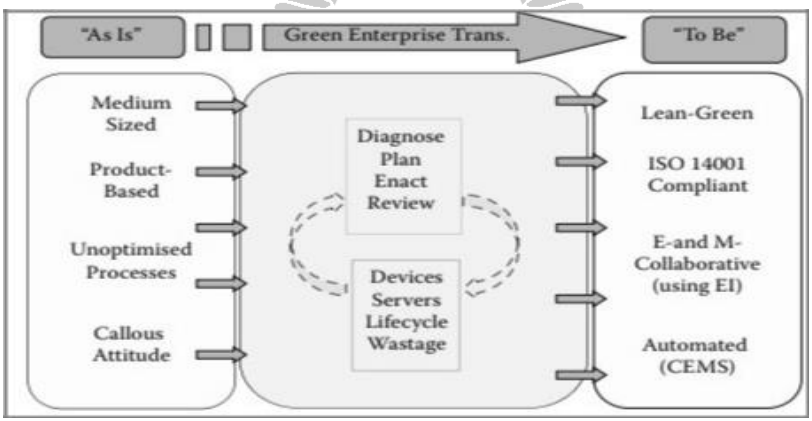

Fig 5. 4: GET for B4Pack

5.4.1 B4Pack's Green IT Strategies

Focus on use and capitalization of technologies with the creation of a Green IT portal. Use of the portal itself for reporting on carbon compliance by the organization.

Launching of a GET program that is going to enable compliance with ISO 14001 standard.

Understand the g rowing environmental awareness of all its customers

Extend the current process optimization initiative to make it a formal Lean process implementation that will also be measured and reporting for corresponding green-ness.

Form a consortium of likeminded businesses in the region and provide leadership through initial experience of GET.

Influence and be influenced by customers and suppliers in terms of carbon compliance.

5.4.2 SWOT of B4Pack in Green Context

Strengths

Visionary leadership through the new CEO and corresponding CGO

Growing business with sufficient funds enabling easier green IT initiative

Material-savvy region, with more than a decade of experience in packing/container production

Strong distribution network—particularly overseas customers

Weakness

Aging infrastructure—especially technical assets such as computers

Workforce only experienced in package production—not necessarily IT literate

Non-serious attitude of most workers toward carbon footprint

Noticeable wastages in packaging products and IT

Opportunities

Leadership in packaging materials and designs

Potential to leap-frog in terms of computing technologies by directly using the latest, low carbon emitting machines and servers

Acceptance of ideas by partners—customers and suppliers—thereby creating leadership in the Green IT/carbon compliance space

Threats

Attitude of majority of staff

Differences in compliance requirements of the developing region versus the developed regions where customers are located

Inexperience in undertaking GET in the region

5.4.3 Diagnosis in B4Pack

The CEO of B4Pack realizes that the reduction in costs and optimization of processes will be an ideal driver for the Green IT initiative of the organization. Carbon reduction for its own sake may not provide sufficient motivation for the organization. A good sustainable approach for B4Pack will include optimization of processes, consolidation of its information technology hardware and software and thereby reduce its costs and carbon together. Cost reduction is an excellent driver for Green IT in B4Pack.

Regional environmental legislation requires B4Pack to monitor and report its overall carbonemissions. These are the operational emissions from the package production process, supporting IT systems and infrastructure and the distribution transport network.

B4Pack has many partner organizations both locally in the geographical region of the developing country where it operates and overseas, where its customer base is growing rapidly. The visionary leadership of B4Pack is keen to capitalize on these myriad associations with its collaborating organizations and influence them in terms of their carbon footprint.

5.4.4 Planning for GET

The sections that get affected by GET are the customers and business partners, the IT systems and the Regulatory areas:

- **Customers and partners**: Changes to these relationships will be based on changes to the way

improving the customer information systems to get ongoing sales from customers.

IT systems and applications: Upgrade of CAD/CAM computers to high powered computers that are networked in a way to reduce the interactions required through the various systems and applications.

A new Carbon Emission Management Software (CEMS) together with an optimized manufacturing system that would support new and existing business.

Changes to Service Level Agreements (SLAs) with partners as the organization transitions as also changes to governance structures with greater focus on environment.

External and internal business processes supporting the manufacturing as well as sales/ distribution of the packaging products will be optimized.

Operational organization and green HR resulting from changes to the people structure as a result of green initiative.

5.4.5 Economic Dimension in B4Pack

The economic dimension involves reduction in cost and increase in profit.

This is done by creating value for customers through reduced carbon footprint in the packaging product.

The availability of funds to undertake the transformation is a strength of the organization.

It also includes responsibility on part of the CGO to ensure there is return on this investment in the next 2–3 years.

Direct and positive involvement and interest from the CEO is extremely helpful as the organization moves along this economic dimension.

As a result of green transformation, the CGO anticipates growth and expansion of the packaging product business.

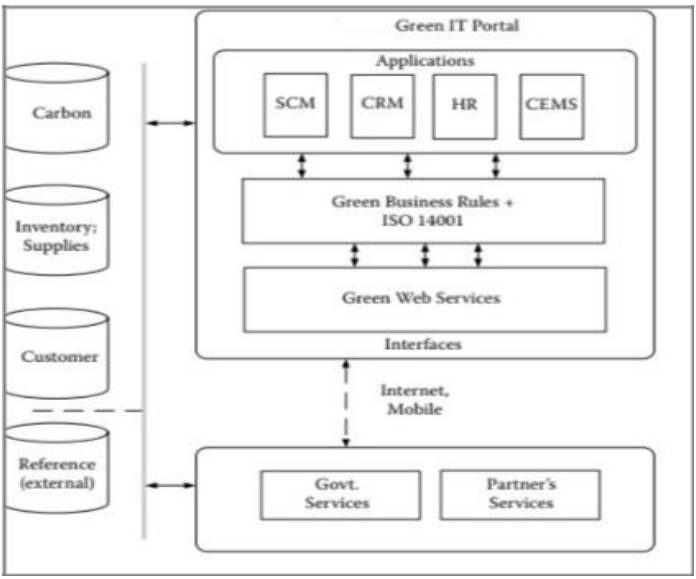

Fig 5. 5: B4Pack Portal

5.4.7 Technical Dimension in B4Pack

A simple CRM package is used for managing technical dimension. Current carbon related data, that was use din the initial investigation is maintained in Microsoft Excel spreadsheet. There is no access to this and such information that

resides on the company's servers to most of the employees.

B4Pack investigated and has decided to procure a CEMS from Microsoft business solutions and form a Environmental Sustainability Dashboard. This product will be integrated **withB4Pack's existing ERP applications to enable tracking of** energy consumption and carbon emissions. This is a measure to decrease the carbon emissions with cost savings. The CEMS will create opportunity for the staff at all levels to understand, in real time, the carbon emissions of B4Pack. Also, the dashboard provides information to all users on their desktop and laptop machines within the organizati**on's** firewalls. A Green SOA will ensure that the new CEMS is properly integrated with the existing applications. The collaborative business partners will be **able to tap into the organization's** systems and receive as well as provide feedback.

5.4.8 Process Dimension in B4Pack

This deals with creation of process models that reflect both existing and new green processes. The modeling of the processes can be undertaken using the use cases and activity graphs various roles within and outside of B4Pack. The process dimension of GET has to consider collaborative customers, who will be interacting with B4Pack electronically. The services provided to these corporate customers can be enhanced and optimized to not only add value through accuracy and timeliness but also reduce the overall carbon associated with the collaborative processes.

5.4.9 Social Dimension in B4Pack

The social dimension of the GET is involved with the changing of the attitude of its staff and, also, the changing Green

HR function. B4Pack has to move toward creation of a social networking site. Awareness of the carbon issues and the way they will impact the future of not only the organization, but the country and the global business can bring about a change in attitude. Green HR brings about changes to the organizational structure. This change starts with the appointment of the CGO and the subsequent formation of the green transition project team.

In addition to the CGO, there is an external consultant with expertise in GET, two department level managers fully dedicated to environmental management and 6 supervisors to support them. All of them are involved in diagnosis, planning, enactment, and review phases. Green IT auditor is an additional support role which is also involved in creation, validation, and use Green IT metrics and measurement. Staff will be trained to use the CEMS. Smart meters will be fitted to most equipment involved in the production line to calculate directly the emissions from those production lines.

The social dimension of GET also takes responsibility for management of the changes to the designations and responsibilities of line managers, legal implications a rising from the changes, possibilities of telework, and related privacy issues.

5.4.10 Enactment of GET for B4Pack

The following are the specific highlights of the enactment:

CEMS—Implement and integrate with the existing systems.

Comply and maintain ISO 14001

Model and optimize green processes

Setup customer/partner portal collaborations through electronic web services

Upgrade to green data centre

Emissions reporting through web services to government portal

Undertake Green IT audits (internal and external)

5.4.11 Review of GET for B4Pack

The review phase deals with verifying and validating the stated outcomes of GET for B4Pack.Green IT audits that have already started during enactment. The formalized findings are reported.

Furthermore, the outcomes need to be measured and studied not only for the new business, but also for the new environment in which the business is now oper**ating. B4Pack's** Green IT outcomes are slightly different to the stated goals. This was expected as the business itself was changing and growing during the period of GET. Evaluation of the outcomes include reviewing in accuracy of CEMS, the way in which it collects and reports data and undertaking sample tests to run through the CEMS. Furthermore, green process models are subjected to walkthroughs and inspections to ascertain their accuracy and value in GET. Potential changes to organizational structures and business models are internally audited to ensure they do not adversely affect the business.

These measurements are incorporated in the feedback by the Green Transformation Cham-pion (GTC) to the boards responsible for the green transformation as also to the business stake-holders. Thus, the review process not only ascertains the achievements of the GET but also opensupdoors for further improvements with partners. The Service Level Agreements (SLA) has to be revisited and necessary modifications has to be made.

5.4.12 Lessons Learned in GET for B4Pack

B4Pack as a product organization with supporting IT systems had to focus on the end-user and its processes.

GET is a comprehensive business transformation process that includes people, processes, technologies, and return on investment (ROI) calculations.

Attitude change for people working on production lines is not achieved only through training. A manual process such as one using whiteboards on the shop floor was as valuable as the implementation of CEMS.

Data centre upgrade required coordination with the production processes that are heavily dependent on the production applications.

It is difficult to measure the overall carbon reduction by optimizing the design of a package, since the carbon footprint of a package is made up of its usage and eventual disposal.

Compliance with ISO 14001 is easy to implement in a production shop, but maintaining that compliance proved to be more challenging.