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Evaluating Sustainability Management Systems Reporting Software and Tools

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Abstract

Major organizations around the world are increasingly looking for new way to support their financial status to be more efficient by studying the long-term impacts of their processes. One method of achieving such an improvement is by progressively utilizing corporate sustainability reporting. The number of organization which is following this approach is growing as more organization are continuously measuring, managing and reporting their environmental and social impact which also helped the corporate sustainability reporting also to evolve, and it led to more extensive studies that go beyond the company's process and direct activities to promote better understanding of their entire value chain map and its impact on the environmental, social and economic aspects that are relevant to a variety of stakeholders.

This thesis discusses the continued growth of corporate sustainability and social impact measurement, starting with the fundamentals of reporting. It observes different reporting frameworks that organizations use to measure their effect, with a focus on the Global Reporting Initiative (GRI) then we will try to discuss the best practices to make the transitioning process less complicated for the enterprises which are currently using a platform that utilizes G4 as a central sustainably standard and is going through the transitioning process to the new GRI Standards.

Finally we will discuss the impact of the growing use of sustainability reporting systems as commercial software products in small and medium size organization and establish an evaluation process and selection criteria of appropriate products and spotting a light on an increasingly essential activity. Though, various organizations find this process to be challenging when it comes to selecting appropriate sustainability reporting software products for use in systems. As part of a cooperative effort, the Software Engineering Institute and National Research Council Canada have defined a customizable commercial off-the-shelf (COTS) software product evaluation process that can help organizations in making sensibly and coherent product decisions. The process for that evaluation process, as well as the criteria that should be considered when choosing a sustainability reporting system, are defined in this thesis.

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Abbreviations

AT&T	American Telephone & Telegraph
CERES	Coalition for Environmentally Responsible Economies
COTS	Commercially Available Off-The-Shelf
CRS	Common Reporting Standard
CSR	Corporate Social Responsibility
ESM	Enterprise Sustainability Management
EMS	Environmental Management Systems
ESG	Environmental, Social and Corporate Governance
EFFRA	European Factories of The Future Research Association
FSS	Financial Services Sector
GANTSCH	Global Action Network for Transparency in The Supply Chain
GRI	Global Reporting Initiative
GSSB	Global Sustainability Standard Board
OECD	Guidelines for Multinational Enterprises
SHINE	Harvard's Sustainability and Health Initiative for Net-Positive Enterprise Project
ICT	Information and Communications Technology
IBM	International Business Machines Corporation
IIRC	International Integrated Reporting Council
ISO	International Organization for Standardization
KPI	Key Performance Indicators
KPMG	Klynveld Peat Marwick Goerdeler
MoU	Memorandum of Understanding
NRC	National Research Council Canada
NDA	Non-Disclosure Agreement
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-Operation and Development
OS	Organizational Stakeholders Program
PECA	Plan, Establish, Collect, And Analyze
SMI	Service Measurement Index
SRIS	Socially Responsible Investors
SEI	Software Engineering Institute
SC	Stakeholders Council
SASB	Sustainability Accounting Standards Board
SDG	Sustainable Development Goals
TAC	Technical Advisory Committee
DPOC	The Due Process Oversight Committee
GSSP	The Global Boundary Stereotype Section and Point
IAC	The Independent Appointment Committee
BTP	Transparency Program
TBL	Triple Bottom Line
OHCHR	Office of the United Nations High Commissioner for Human Rights
UNEP	United Nations Environment Program

UNGC	United Nations Global Compact
SDGS	United Nations Sustainable Development Goals
SEC	United States of America Securities and Exchange Commission
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development

1 Introduction

The way how organizations charge their services and products is the key to understand the strategic behaviors of pricing that indirectly affects the performance. Pricing can be one of the fastest and most efficient means of maximizing profits for any organization .

In the last decade, the market has witnessed a growth in the number of enterprises that are aiming to make their operations more sustainable.

In 2010, only about 20 % of the Standard and Poor's 500 companies had published regular sustainability reports. By 2015, that number had jumped to 75 % (Sustainably Dashboard: Growth of Sustainability Reporting Reflects Growth of Green, Social, and Environmental Issues, 2017).

Furthermore, enterprises are trying more to achieve a long-term cost efficiency while they are making sure that social responsibility and environmental protection is well-preserved. Securing those principles are only going to get more focus over time as the need for additional sustainable economy is gaining more acceptance and demand from all the different individuals who are involved in running the business and also by the general public.

GRI Standards, ensure that sustainability reporting helps organizations with their practice of reporting publicly on their economic, environmental, and social influences, which help to determine their contributions towards the goal of sustainable development, whether It is positive or negative. The reporting process is the stage where the organization discloses these reports by a globally-accepted standard.

The process of collecting data for sustainability management and the ability to report these data help the different business sector to define their next goals, tracking their performance and check if they met the desired results and also making the needed changes to make their operations more sustainable. The advantages that sustainability reporting can help the organization to realize their activities more efficiently and be able to determine their impact on the environment whether it is positive or negative, and also provide an excellent vision on the impact the organization has on the society and the economy. The help that sustainability reporting offers can make those impacts easier to deal with, by providing the tools needed in helping to understand and dealing with those impacts, which allows the overall organization strategies to improve.

This data must be structured and approved internationally by the same standard so it can be related and comparable, which would help the decision makers with a reliable tool to help them choose and defend their decisions

The previous versions were initially developed to ensure these principles, at the same time, the Global Reporting Initiative made sure to add a constant update to keep the standards most relevant to the new practices of sustainability reporting.

The implementation of the new GRI Standards kept most of the fundamental concepts from the previous versions, which includes the Reporting Principles, reporting the management approach, and the emphasis on reporting only on material topics. Thus, it helps reporters prepare sustainability reports that matter, by including valuable information about organizations most critical sustainability-related issues and make such sustainability reporting standard practice.

It is crucial for society and markets that sustainability reporting evolves regarding content, and from an unusual activity undertaken by a minority of leading companies to standard practice.

The GRI standards are considered to be more user-friendly than the previous versions while making sure that the key features from them remain to be secured, by keeping the primary focus of the organization on the reporting process and final report on those topics that are material to their business and their key stakeholders. As 'materiality' focus will make reports more relevant, reliable and more accessible to the user. Which will help the organizations to inform markets and society on sustainability matters more efficiently.

Some organization may require more broad observation on their sustainability-related topics due to the nature of their activities, and by ensuring the focus on materiality, the organization will be sure that their sustainability reports will be focused on the critical events which will help the organization to achieve their goals and observe their influence on society.

GRI standards were designed to be universally suitable to aid a variety of industries and organizations, which was ensured during the developing stage of the new GRI standard as it went through an intensive process of reviewing a significant number of reports offered by professional reporters and reports from a different type of industries from all over the world. Which makes the GRI standard relevant to various kinds of organizations and offer a reputable support to worldwide. This process is completed by providing a high level of consistency which is needed to make the reported data more relevant and credible to market and society. And like the previous versions of GRI Guidelines, GRI standards contains references to widely accepted and used issue-specific reporting documents, which also make it easier to be universally adopted

The new GRI Standards form shared standards for organizations and stakeholders. The Standards are designed to increase the global comparability and quality of information on these organizations' impacts, which allows a greater transparency and accountability of agencies.

This information is accessible through sustainability reporting that allows internal and external stakeholders to form thoughts and to make decisions about an organization's influence to the goal of sustainable development.

The GRI standards also offer directions on how to present the information by utilizing different formats of reports: standalone sustainability, integrated, annual, reports that address particular international norms or online reporting.

The emphasis on the importance of sustainable management along with combining it with other financial information is proven to be very important to ensure a positive development, while the importance of sustainability management has shown a significant growth in the recent years. The direct effect of its benefits has been a central focus of organizations, markets, and society. Therefore, sustainability reports that are relevant material to any company's value and should, thus, be at the center of its focus.

1.1 Motivation

The thesis explores how the Investors are always asking for more transparent access to their investment sustainability plans and its performance. making sure that this process is being done correctly and regular checking for the best practices is not always an easy task to accomplish. Particularly because of the fact that the complexity of keeping track of all the record is a cumulatively a complex task.

This thesis will cover the current state of sustainability reporting. It mostly centered around the topics which are considered to be most related to new companies which are willing to start with their sustainability reporting. It is also worth mentioning that sustainability reporting includes all the reporting wish are not considered as a financial report, but the organizational social and environmental performance.

There is a general bullet point that can be considered as the broad line of the current state of sustainability reporting:

- The quality of the reporting standard is generally increasing. The current report has rich a state where low-quality reports have shortened the gab with the average reports and the high-quality reports are maintaining their quality, all this has been achieved by strictly following a concrete standard like the one offered by the Global Reporting Initiative which would be discussed in details in this thesis.

- Another advantage that standardization offers is the significant amount of consistency amount different business areas, sectors and enterprise of different sizes.

- The size of the report that a company produce is not an indication of its quality, it's more has to do with the method followed and the presentation of the information included in the report

- There is more necessary effort that needs to be done concerning the sustainability context which is considered to be vague as many reports ignore some of the fundamentals trends which affect the business model and concentrate more on the aspects that directly affect the financial spectrum.

- The Integrated Reporting has not reached its maturity yet since it's not wildly adopted and is has not been proven to be a better method for sustainability reporting.

GRI and SASB invested more effort in toward the Materiality concept, which is a concept that went through a long process until it was a mainstream approach to sustainability management practice. Since early 2001 the Materiality concept was considered as a cornerstone to address the issues of strategic business concerns related to sustainability to bring into line the sustainability reporting methods with the business concerns. Later in 2003, the accountability counsel published a redefinition of materiality which is the foundation of today's existing methods. Several leading establishments have approved materiality within their sustainability management and reporting approaches. Later on in 2014 by the time when the GRI released their G4 Sustainability Reporting Guidelines, the materiality concept played a substantial role in the reporting process, and the G4 helped in increasing the referenced materiality and disclosed the organizations' approach to classify and prioritize material topics. This process was done by a materiality matrix which made a very important impact on increasing the reporting quality. This didn't always mean that a report made according to the G4 standards would automatically be a better report because it was still possible to generate a report according to the guidelines and principle listed in G4 but still not clear enough to describe the process which was followed to identify the important topics which were a common mistake that has a direct effect on the connection between the material issues and the core business. The Global Reporting Initiative has been in the process of standardization, which meant that as an alternative to publishing a set of guidelines to help enterprise to generate sustainability reports, a complex set of standards

have been in development, that represent the first global standards for sustainability repointing. in addition to that, a certain report might have a good materiality documentation and matrix but address a set of content section without maintaining a materiality narrative. Although there is some enterprise that generated reports which are considered as exclusion from this problem. Another common problem from the G 3.1 was that some organization would submit a complete report which is considered to be in complete alignment with the standard but fail to justify some of the content in the reports or exabit a lack of understanding or interpretation of what the GRI really required. Another major force that is helping more adoption of the materiality concept is the SASB (The Sustainability Accounting Standards Board) which is consistently trying to make a growth in the extent to which enterprises reveal data about their performance and the intent in sustainability so it can help the stakeholders to learn more about its capabilities in helping them on making better design for their process and helping them make better decisions. As an effort from SASB to assist this, SASB has developed a materiality navigator tool. Although all these efforts won't actually be effective if the actual investors and stakeholders didn't participate in engaging with companies in a more inclusive way and keep asking question on how sustainability will, directly and indirectly, affect their efficiency and their ability to meet their goals

The fundamental of a well-planned sustainability management and therefore reporting is the framework. for many years the framework has been clearly visible by its absence in many of the reporting strategies. But over the year there has been a significant growth in the clarity on the international trends that will gradually form the working framework for the enterprises which are providing new and growing sources of risk and opportunities. Sustainability management and the reporting practices that used to ignore the framework is considered to not strategic and therefore not sustainable. Regardless of this, most the reports tend to ignore a clear standardized framework. For instance, some reports contain data on the working framework but make a little use of it as most of the reports concentrate on gradually reducing the impacts rather than understanding the activities and the plans that can be transformed to be more sustainable. On the other hand, the more complete reports tend to be more focused on the framework. These reports with a clearer and more direct dependency on the productivity of the natural system are gradually getting more understanding on locating their sweet spot performance points within the framework of the planet's restrictions and resources. There are still a lot of work to be done. Enterprises often limit their goals to do less environmental impact in the future than their previous stage but generally, there is a lack of understanding for the big picture that drives the global environmental sustainability and how to create a future strategy and business plan for the coming years. To be more detailed, a few enterprises are doing more than what they necessary level require them to do. Resources and energy are being used to their highest limits and water and food demographic is changing. A very interesting plan is being developed by the Reporting 3.0 platform which is a cooperative expert who collaborates with developing a guidance tool and materials for the development of the renewable and inclusive global economy.

Integrated reporting: with every year we see an increasing number of integrated reports. Which for a long time has been considered the future of non-financial reporting and it is predicted to join the financial data to combine a unified formula. Although it is still not clear if their actual use is on the rise significantly. Some enterprises use the International Integrated Reporting Council (IIRC) Framework as it offers a multi -capitals approach combining the organization performance in different capitals from the financial, manufactures, human intellectual, natural and social. It worth mentioning that the concept of multi-capitals is still not very clear to some organizations for instant some companies submit reports that include data only in relation to minimizing the direct operational impact but fail to address the impact of their core operation on the natural capital. This scenario is somehow problematic especially when extractives or finance establishments follow this tactic.

Progression in environmental reporting: there has been a noticeable growth in environmental reporting the recent years both in quality and quantity of reporting. Some countries, like South Korea, has made a great progress in improving the quality and the scope of reporting. They rely heavily on ISO 26000 (Social Responsibility Guidance Standard) and their reports tend to be steady comparing to those you can find in other single geographic areas.

Reporting plans, goals and performance: even with all progress that has been done in regards to environmental reporting there is still a lot of work that has to be done, many reports fail short on explaining their strategy or to have a credible connection to some broader report topics. Some organizations motion their environmental strategies in their reports without mentioning what the strategy is and how well it is being performed and worked on. Such lack of explanation doesn't help to take the sustainability measurement seriously enough as it doesn't help on expanding what strategy is working well and what errors should be corrected. When giving a clearer performance reporting with more clarification, these issues can be addressed more easily.

1.2 Structure

Chapter 1: Introduction, present the topic discussed in the thesis and illustrate the problem that enterprises are facing when trying to adopt a sustainability reporting tool, it demonstrates the main reporting framework that is currently available. It also illustrates the paper's structure and gives a quick look at the content of the thesis.

Chapter 2: Preliminaries, Illustrate the importance of sustainability management and the environmental management system. The Plan, Do, Check, Act cycle and the limitations facing the current status of the EMS.

Chapter 3: Environmental and social Reporting, explore the Environmental and social Reporting status starting with a historical overview and then continues into showcasing the main providers of sustainability reporting guidelines. After that, it progresses into describing the current status of sustainability reporting standards and its importance to guide the reporting process along with its goals and the challenges that the sustainability reporting standards are facing.

Chapter 4: GRI Sustainability Reporting, discusses in details the Global Reporting Initiative organizations starting from its formation. It demonstrates their current market status, their goals and their philosophy. After that, it showcases the development of their standards by unfolding all the versions that the standards went through, the main publications that led its progress, the serves that they introduced over the years, their partnerships and alliance, the conferences that the GRI held and the new offices that they opened around the globe. After that, the chapter goes into more details about their last sustainability gaudiness versions, the main features that it offers. Then a description Transition process from G4 to their last version (GRI standards) and the chapter is concluded with the process of describing the validation of reports before the final submission.

Chapter 5: Development of the environmental and sustainability reporting, illustrate the different stages that it went through. After that, it goes into more details about the GRI Certified Software and Tools Program and describes how The Certification Process is done and what are the Requirements for applying the GRI content.

Chapter 6: Framework for ranking Sustainability Reporting Software. It showcases the current status of the market when choosing a sustainability reporting software or tool and how a customer can't rely only on the standards when choosing a reporting tool and suggest an Alternative method. The chapter discusses the evaluation process that is being done when choosing a reporting tool or software. After that an introduction to the PECA process stages as a method of evaluation and then a demonstration of the most important criteria that needs

to be focused on when choosing a Sustainability Reporting Software and tools

Chapter 7: Conclusion and Future work summarizes the results and gives an outlook for future direction.

1.3 Literature Review

The literature review was performed a reviewing and examine the state of the art in past and current publication on sustainability management systems, sustainability reporting tools and software, and key providers of sustainability reporting gaudiness

1.3.1 Research Questions

The following research questions are considered the core of the research:

What is the current status of sustainability reporting tools and sustainability management?

Different organizations have adopted different strategies for sustainability reporting to help enterprises on revealing their sustainability management data. Each standard has its own advantages and shortcomings. It would be interesting to explore the providers of this sustainability reporting gaudiness and highlight the features they provide.

What are the chrematistics which make the GRI standards the most widely used among all the key sustainability reporting gaudiness providers? Sustainability reports based on GRI standards make up to 74% of all the sustainability reports issued around the world. The thesis explores the non-profit Global Reporting Initiative organization, its history, the versions of its standards through the years and the new features that the was introduced in their latest GRI standards version.

How does the GRI relates to ICT architecture? what are the steps that the GRI took to encourage the use of ICT? what are the advantages and challenges which are facing the ICT in regards to supporting sustainability reporting?

Recent studies have suggested that Web-based sustainability reporting is now entering a new phase of reporting. Thus, internet-based sustainability reporting continues to develop. (Mark Line, Volume 9, Issue 1, February 2002). It would be important to explain how the ICT is supporting the sustainability reporting process and also explore the advantages and challenges that the ICT offers. It also important to expand on how the GRI is advancing toward more use of ICT and how is that being done and the programs they have regarding this topic.

What are the problems facing companies that are starting with issuing their sustainability reports and how to overcome these problems?

Since the majority of organizations concentrate mainly on their financial reporting and spend less attention on their sustainability reporting, it becomes a hard task for these companies to start issuing their sustainability reports, the thesis tries to provide guidelines to these companies to help them choose a suitable sustainability reporting tool and start issuing their sustainability reports.

1.3.2 Material Collection:

The material collection covers the scope of the research: mainly the found materials cover Sustainability management and sustainability reporting related to ICT along with the key providers of the sustainability management guidelines. The answers for the research questions were found. The research focused on the material published from 1990 to 2016. The search for materials includes resources from journals research papers books and

Resource Libraries specifically, Google Scholar, Springer, Microsoft Academic Search, IEEE Xplore, science.gov. These sources were selected as they cover the possible needed resources. The research also included relevant publications from the sustainability reporting standards key providers like the Global Reporting Initiative Resource Library.

2 Preliminaries

2.1 Environmental Management Systems

Customarily over the past two decades, Environmental management systems (EMS) used to be implemented within the companies or organization as a way to approach and address the changes concerning environmental topics. Organizations and businesses have since realized that submission to regulation was not adequate for facing the growing challenges when facing pollution and monitoring production operation for proper execution (Hoffman, 1994) (Yosie, T. and Herbst, T., (1996)). The frequent misunderstanding of facility environmental impacts by environmental, health and safety personnel was not adequate to control operations which leads the organization to the development of an Environmental Management Systems which can detect the different activities to calculate the environmental impact of a specific facility. An EMS can include diverse activities and ecological obligation, depending on the company or the organization which is using it. EMS also contains parts of the organization concerning the environment obligation, and it helps the organization by providing a concrete structure for its activating to help it to comply with the environmental regulations.

The primary goal for EMS is to identify how to work with the task that has an environmental impact, to specify how to do it as it is regulated and to continuously check the performance to validate that it is being done as for how it was planned for it. In case there is a deviation between what the previous expectation and the actual result then some correction must be done to identify and eliminate the problem. This procedure is done by what is called the four-step process of plan, do, check, and act, which is often referenced as the general framework for initiating and maintaining an EMS (Wilson, 1998) (Marcus, P. and Willig, J. (Eds), 1998) (Woodside, G., Aurrichio, P. and Yturri, J., 1998) (Cascio, 1996). Firstly, the organization must set a concrete plan for its environmental compliance requirements and the environmental impact that might occur. Secondly, the employees who are responsible for the environmental management in the organization must do the needed steps to avoid noncompliance and ecological damage. And of course, a continues checking of the plan must be performed to ensure that the project is functioning correctly and that the addressed environmental related topics have been covered. Lastly, the organizations should continuously work on improving their Environmental Management System and periodically make the necessary changes to solve any problem that might occur. By following these steps, the organization should be able to evaluate its accordance with the regulation, and it will be able to work on improving their system continuously.

2.2.1 Environmental Management System objectives

Sustainability software and tools have to follow other requirements than just the regulations that the governments try to enforce on them so they can support the general sustainability plan set by the regulators (Coglianese, Cary, Nash J (eds), 2010). Sustainability software or digital tools also consist of a collection of an internal effort at policy making, assessment, planning and implementation (Orts, 1995) (Coglianese, Cary, Nash J (eds), 2010). Sustainability software and digital tools are the backbones that help the organization to process the sustainability-related data and entering them into their systems which would support the organization to processes these collected data and that enable the organization to reduce their impact on the environment continually. These software and digital tools are the driving force for the organization’s Environment management system (EMS) which

define the environmental policy as well as the methods to be followed to evaluate the processes that the organization comply to assess their environmental impacts, establish, implement and monitor the ecological goals (Lamprecht, 1997).

The first step that an organization takes when willing to adopt an environmental management system is to ensure that the whole organization will be committing to the goals that the organization's environmental policy. This policy is often made public and describe the organization views on ecological improvement. The environmental policy usually encompasses assurance for increasing the gain to the policy aiming for reducing pollution while making sure that it complies with the relevant environmental legislation (Starkey, 1998).

The next step for an organization adopting an Environmental Management system is to evaluate their goal. Throughout this stage, the organization should determine the method they are willing to follow when applying their environmental policies into actions by defining their management priorities (objectives and targets) (Netherwood, 1998).

The third step that an organization has to take is to establish a management structure to realize its environmental goals. This stage includes the training of the employees, enforcing the communication structure within and outside the organization and reducing its environmental impact.

The fourth step for adopting an Environmental Management System is monitoring and corrective action. Since the primary goal of EMS is to improve the organization environment management, and it's essential for the organization to work on their environmental improvement continually. The organization has to monitor the differences by recording and documenting the routine operation of the EMS and then to audit their activities regularly. Another action to take when a deviation occurs is to find the initial reason for it and correct it so it won't happen again and by doing so, the organization would ensure that that the continuous environmental development of the organization stays on course (Netherwood, 1998).

The fifth step which is essentially being followed by all types of EMS is management review. This critical stage assessment of internal audits, progress reports, non-compliance actions, new environmental concerns and recommendations to amend the EMS (Netherwood, 1998).

After going through all these steps, the organization has to implement and continually update their EMS status report. The reports will help in identifying the EMS's deficiencies and highlights any needs for a stricter controlling, modification to the objective and targets, or even setting new goals (Welford, 1998). Regardless of the fact that all Environmental Management Systems have the same adaptation steps, still, each one has different methods of making the environmental impact easier for stakeholders and follow a different approach in integrating the environmental management into the organization (Netherwood, 1998). One way to minimalize these differences and provide a better direction during the EMS adoption process, the ISO created it's international EMS standard, ISO 14001 Environmental management (Netherwood, 1998). When adopted, this standard helps the organization to launch an external legitimacy for its EMS (Bansal and Hunter, 2003), since this standard gives a clear set of specific guidance at each EMS adoption stage while also involve an external third-party registrar verifies that the EMS follows the ISO 14001 standard (Starkey, 1998). In contrast, organization or companies who choose to adopt a non-certified EMS have more flexibility in the level which they decide to integrate the environmental management during the organization, and by doing so, they avoid certification cost as a part of their Environmental Management System adoption process.

The cost of adopting an EMS including the certification, in case the organization chose to follow a certified standard, is accumulated throughout the EMS adaptation process stages.

Nevertheless, the first three stages are considered to be most intensive stages resource wise. The organization has to allocate more resources at the early stages of EMS design since the organization has to spend more resources on extensive internal evaluations, employee training, and plan development (Philip J. Stapleton, Margaret A. Glover, S. Petie Davis, 2001). A third-party consultation might also be required and temporarily hired during these early stages of adoption to help to push the transformation process quicker. Training expenses vary since it's correlated to the employee's travel cost to EMS development workshops. Moreover, the organization might have to obtain new equipment and materials to enhance the EMS adoption, even if these expenses are generally anticipated to be nominal thought the EMS adoption process and more applicable to the later stages when the organization works on the continual improvement process (Philip J. Stapleton, Margaret A. Glover, S. Petie Davis, 2001)

2.2.2 Importance of EMS

Companies who are willing to start reporting their environmental practices seek not only to report their activities but also to initiate a valid benchmarking which would allow them to compare their performance against other the performance of different organizations which are doing the same kind of business and also among their individual facilities. This process is not only considered as an evaluation mechanism but also all the organization's top management to figure out new ways to drive their business forward and closer to follow a more efficient sustainability practices. One method that is being monitored to benchmark across facilities is when the organization takes advantage of the publicly published reports from other organizations in the same industry.

These publicly published reports help the organization to compare their operations with other competitors and also among different branches within the organization. Still, the information that can be collected from such reports is limited since those reports are usually not related to the production levels at the facilities and they also don't indicate all the possible waste materials which might hinder the final evaluation. This leads us to the conclusion that the acceptability of a meaningful data and the level of helpfulness that an organization might get from it are limited when it's being used for comparing the organization's own data with other competitors in the same industry, still these data are useful when the organization tries to benchmark these data for internal corporate evaluation. One way that an organization or a company can benefit from publicly published data is the usage an Environmental Management System (EMS). These tools try to collect the environmental problems of an entire facility or organization and help the organization to set a plan for their environment development while making sure that this method would frequently get improved to handle the development of the environmental performance.

Environmental Management System is a collection of policies, procedures, and audit protocols for operations that create waste materials or emissions. For instant, if a production line produces a particular kind of a hazardous waste, the EMS will offer methods for the organization to help them on how they can collect these wastes and handle them, it will also help the organization to identify who is responsible for each activity and what to do in case of a spill or leak happens. Another feature that an EMS provider is for auditing practices and then offering a platform to review these practices so it can be improved.

The development and operation of an EMS follow the iterative four-step management method (plan, do, check, act) which is used in business for the control and continual improvement of processes and products.

A significant number of organizations and company are developing their EMS and adopting it across the organization based on guidelines such as ISO 12001 EMS, ISO 26000? Social Responsibility Guidance Standard or the Global Reporting initiative. For instance, IBM decided to implement their own corporate EMS and gave the task to their own corporate environmental personnel to lead the development and the management of a single system

which is installed across all their facilities worldwide (Balta, W. and Woodside, G., 1999). Other companies and organizations such as FORD or General Motors, take a different approach when it comes to environmental management since they decide to let each of their facilities to establish its own EMS that follows a standard structure. Which helps the organization to develop their systems in different facilities and at the same time ask them to share their information and suggestion for improving the processes, documentation and the learned lessons from each facility.

This method helps the organization to simplify the internal corporate environmental benchmarking (in essence, the organization will be using a pre-existed EMS which was developed in one of their facilities and then use it as a benchmark to evaluate the performance of the subsequent facilities (Matthews, 2003). Overall, the EMS respectively offer facilities with the guidelines that they should follow during their operation such as environmental policy and procedures that describe activities, in addition to selected employees with responsibility for environmental topics. Typically, every facility takes responsibility for their own auditing and review their own operation, but at the same time, they all have to be on common ground concerning environmental issues while preparing their data to be compared with other facilities in the organization. Still, the overall benchmarking of the facilities remains a difficult task for the organization. EMS frameworks don't necessitate data collection and reporting of similar measures of environmental performance would help the organization to benchmark their operation. To solve the problem of allowing the organization to benchmark their internal corporate environment, a concrete EMS must be adopted, so each facility cam provides the organization with information that is useful for the whole organization's environment strategy. Luckily, the changes that are needed are fairly simple to apply, firstly, there needs to be a common goal set by the organization, and then the organization has to establish a common requirement for the methods they decide to follow for collecting the data and then reporting it. This information can be easily combined with other EMS reports from all facilities.

2.3 Plan Do Check Act (Adjust) Cycle

The following segment will describe the four-step of the plan, do, check, and act process in more details.

2.3.1 Planning

This step covers the environmental policy, Impacts, and goals

The environmental policy is considered to be the core element of an Environmental Management System. The policy characteristically gives an in-depth look into the organization's acknowledgment of its environmental impacts and clarify the obligation to its constant ecological improvement. Environmental policies offer the guidelines for the values and goals of all the stakeholders of the organization. The level of completeness of these policies may differ extensively for being unclear and very generalized to very detailed and goal oriented directives. An additional part of the Plan stage that the organization has to manage is to decide and determine environmental impacts and compliance requirements carefully. There is a different variety of the environmental impact that the organization might have, and the regulatory obligation might contain wastes and emissions, materials and energy use, or potential hazards from accidental releases (Matthews, Environmental management systems for internal corporate environmental benchmarking, 1999).

The organization might be working in an industry which requires assembly lines, delivery of products, or office work. Thus, the environmental impacts of the organization must be addressed accordingly. Most EMS contains a set of goals or objectives to help the organization with their effort in reducing their environmental impact. The purpose and objective can be universal, like working with the organization's suppliers to decrease

packaging waste. Also, these objectives might be a subject of change from year to year, but in general they should determine the primary goal that the organization is willing to achieving in its effort of helping reducing its environmental impact. Some EMS guidelines outline specific areas for the enhancement of the goals and objectives. For instance, when the organization is aiming to reduce their packaging waste, the purpose is stated as "lessening the packaging waste by a (certain percent) by weight over the next (certain period). The planning stage in an EMS aims to define the basis for the later stages of the process. The obligation to the environmental topics, the determination for an incessant development and the organization goals and targets deliver the framework for ecological employees to detect where they have to place their focus.

2.3.2 Doing

This step covers the environmental activities and environmental documentation

The second phase of the process is when the organization has to define the actions to be taken by the EMS. The activities which are considered as a part of the EMS contain work practices and operating instructions. The Environmental Management System has to identify the needed procedures for the different task while putting weight on lessening the environmental impact and following the governmental environmental regulations. For instance, some actions like the method followed for taking care of waste materials or completing air permit reporting are considered as part of the EMS. This kind of activities are commonly defined in the Environmental Management System documentations; these documentations contains a vast number of different elements, including the environmental policy, the regulations that the organizations have to follow, procedures and protocols for activities, and records of monitoring and measurement. These documents also contain specific guidelines for the actions that the EMS cover and the method that the organizations' environmental employees have to follow in order to meet the final goals of improving the environmental management across the organization. The documentation puts into writing the structure of operations. For many organizations, the documentation of the EMS is the main task (Godfrey, 1996)

2.3.3 Checking

This step covers the process of environmental auditing and performance evaluation

The third stage of an Environmental Management System is when the organization should perform an assessment to their operation. It generally uses the term Auditing to define the assessment of the Environmental Management System's mechanisms. The Auditing process consists of making an interview with the employees to determine their awareness of environmental topics and also to define their responsibilities. Auditing is also the step where the organization has to investigate if a problem has occurred during the previous stages and it caused an unexpected environmental impact. If in fact a problem has been founded, the auditing would try to search and identify the reason for the occurrence and suggest amendments to the EMS documentation to prevent the problem from happening again in the future. The step helps the organization to improve their environmental performance by detecting and studying the ecological performance metrics.

2.3.4 Acting (Adjusting)

This step covers the process environmental training and communication

The last element of an Environmental Management System is training and communication which aims to help the organization to act upon its ecological performance. The training and communication happen at various stages to ensure that the process of improving the awareness of the environmental impact of operations covered across all levels of the organization. The training contains more details instructions on personnel roles and

performance. The training also guarantees that the personnel is ready to do their normal tasks and that they fully comprehend the consequences of the environmental impacts that could be caused if the tasks were completed improperly.

The second part is the communication, which is a process that involves notifying all the related employees of the EMS. The environmental policy, and their role in the ecological topics. The communication should be engaging all the organization's level so it can help in improving the knowledge of individual obligation in everyday activities which help in raising the commandment level of the organization's personnel about environmental topics. Some communications might cover stakeholders from outside the organization itself like suppliers, customers, communities, and shareholders. (Matthews, Environmental management systems for internal corporate environmental benchmarking, 1999)

2.4 Limitations of Environmental Management System

The four-step of the plan, do, check, and act process is the core formula of most EMS. But the method that would shape the final EMS structure relies on the company or the organization which is using it and the industry it operates in and also the way they use to handle their operations, it also relies on the level of the commitment that the organization decides to hold for environmental topics. An EMS can be used for organizations' internal environmental benchmarking because the basic components of the EMS track the same steps of benchmarking practices (Matthews, Environmental management systems for internal corporate environmental benchmarking, 1999).

Still, the overall EMS framework and precisely the ISO 14001 standard, doesn't contain some significant vital elements that help the organization to scale the measurement standard across the whole organization's facilities. The reasons for that are that the current EMS frameworks do not necessitate a shared environmental performance goals. As an alternative, each facility has to establish its own goal which is more specific to their current operations and the impacts that they cause. One of the primary goals of the ISO 14001 EMS standard was too flexible. So, it can help a different kind of organization that operates in various industries take into account the variety of their size and the other type of regulations guidelines that might be required from them to follow. This level of flexibility helps each facility to manage their labors at the critical environmental problems that are special about their operation and their business strategy. Typically, the emission levels and the performance goals are not established but the way to handle this is that the objectives should be consistent with environmental policy because the purposes of the EMS are to be selected by each facility, which leads in to having a substantial different focus and effect of the EMS, even for facilities in the same firm. As an example, to this situation (Matthews, Environmental management systems for internal corporate environmental benchmarking, 1999) let's say that an organization operates in two different facilities. One of those facilities is located in the east of the United States is more likely to consider that the wastewater effluent is a top priority based on the fact that the currently existed regulations require facilities to have a local waterway, however, the for the other facility which is located in the west might consider that the energy efficiency is considered to be its primary concern, that's because the demand for energy in that area is considered to be higher. The results of this situation might be that each one of that facility would be able to meet the goals set by their own EMS, still, comparing the benchmark of the overall environmental performance of the two facilities would not be possible because each one of this facility is going after a unique set of goals. Some facilities might also take a different approach to setting an absolute purpose when managing their objectives within an EMS, for an instant, reducing energy consumptions by 10% by the end of the year. These types of goals do not take into consideration the amount of production (less production might lead to decrease in energy consumption, but the facility would still have the same environmental impact) and by doing that changes in ecological performance might be accomplished via lower production levels. By considering all these circumstances, the stage which the organization defines its goals

makes it very challenging for the organization to make an accurate evaluation of the success and the accomplishments of each separate facility.

The other factor which affects the evaluation is that the fact that the EMS normally works in an independent operation within the facility. This is proven by the fact that all the documentation, records, audits and other materials are located within the borders of the facility and are not necessarily widely shared outside the facility's own boundaries (Matthews, Environmental management systems for internal corporate environmental benchmarking, 1999). It's also worth noticing that the scale of the management effort which initially developed the EMS should continue the management assessment, but for the facility level EMS, the management which is responsible for evaluation is more likely to be a top management for the facility, not directly involved employees. The auditing, reviews, and assessment of the development can be measured at different occurrences and times.

The result of the development or the performance levels is typically not reviled. By going back to the previous scenario of having two different facilities that belong to the same organization but operates on opposite side in the United States. Each one of these facilities will have its own measures and records, the employees at each facility will have to perform their specific auditing. Management personnel at each facility will conduct their own management review, and results will often be transferred within each separate facility. One evaluation may happen months before the other. Each facility within an organization might develop and work on a system which is different from the methods that other facilities in the same organization use. The locked nature of EMS which operates within a facility and the changing evaluation agendas do not willingly permit corporate benchmarking.

An additional point that an organization should consider when developing an EMS is that degree of the corporate participation in their application and process. Most of the current EMS frameworks do not address how an organization must launch its systems at different facilities nor how these systems can operate collectively. In some organizations, each facility can choose how to implement its EMS even though the other facility in the same organization may have a different requirement. This might cause that a different type of maintenance and process is being performed by the EMS at each facility. Reporting of management evaluation results on the organization level might happen at different periods based on their review agendas and the Data in the report would be focusing on the EMS of each separate facility and not others. EMS is mostly operating and maintained might be sufficient evidence for top management. For an instant, a facility which is using an ISO 14001 Environmental Management System, the standard does not provide specific necessities for data collection and distribution on environmental performance efforts. Most of the documents linked to an ISO 14001 EMS contains procedures for the implementation activities that have an environmental impact or a potential to generate an environmental impact. Procedures are obligatory for documentation and maintenance of environmental records, which must consist of training records and results from the auditing and review events. Additional supervision document in the ISO 14000 series is ISO 14031 environmental performance evaluation. Which provide supervision documentation on how to use the environmental performance indicators as an administration device to measure the performance of a facility. Like other components of ISO 14000 EMS series, this guideline on environmental performance evaluation is flexible, but at the same time, it provides information on how to establish indicators, collect data, and evaluate performance (Master, 1996) (Kuhre, 1998). Still, there is two crucial point about the ISO 14031; the first one is that the facilities don't have to use the ISO 14031 for its assessment and the other point is that even when using the guidelines, the development might be different from the other facilities in the same organization. Normally, if the data which is needed to be compared to different facilities performance is not obtainable through the EMS requirements, a sufficient benchmarking cannot be accomplished.

3 Environmental and social Reporting

3.1 Historical overview

The earliest sustainability reports were released in the 1980s due to the continued pressure from external groups which demanded a more transparent presentation of their process and its impact on the environment. Essentially the organizations that have a products line which has a direct impact on the environment. Organizations, in general, are always trying to observe their impact on the environment but the process of reporting these data was still unclear, this leads into developing several frameworks which sought to offer these organizations a concrete gaudiness. Corporate sustainability reporting goes by many names: corporate responsibility reporting, triple-bottom-line reporting (people, planet, profit), and ESG reporting (environmental, social, governance) (Cronin, Mary J, Dearing,). Also, there are a variety of tools and platforms that organizations utilize to measure their environmental impact. The Global Reporting Initiative is considered to be the most widely used sustainability report framework among other including the UN Global Compact and the UN Sustainable Development Goals (SDGs). Still, it's worth mentioning that none of these frameworks are in direct competition with each other. And on several occasions, they have issued linkage document to help reporters to understand the importance of the interconnectivity among each other. This is essentially the main reason why organizations usually put more than one reporting framework to use as they don't contradict each other. Stakeholders are demanding organizations to be more transparent about their actions and impact. The center focus is usually the significant global issues like the human right, climate change, poverty, and communities.

There are numerous reasons for this, such as the fact that the natural evolution the measurement methods, as soon as the organization starts gathering their data for reporting, stakeholders asks for more fully comprehensible methods to understand the organization impacts and its interconnectivity with the data collected. Another reason is the nature of the ever-growing global market which exceeds the previous idea about the impact that the company has on the environment, for example preserving natural habitats, providing vaccines, or developing job training for unemployed youth. Which leads these organization to realize that it's not enough for them to only reduce their negative impacts.

Stakeholders now aim to achieve more creative ways that would help these social issues. In the 2015 United Nations Climate Change negotiations in Paris, France. Almost 200 nations came together to form a historical framework through to identify the challenges of the global climate change. (Jen Anderson, Jessica Abensour, 2017)

Before and during the Paris gathering, corporations worked with policymakers to frame the issues and find practical answers to them. The International Chamber of Commerce replicates this approach on sustainability as a corporate significance. The business group stated that "Private sector innovation, investment, and expertise will be vital if we are to track climate change and promote sustainable and inclusive growth successfully. That's why we are advocating for an ambitious global agreement which works with business to speed emissions reductions and build climate resilience" (International Chamber of Commerce 2015).

3.2 Key providers of sustainability reporting guidance

Global Reporting Initiative GRI (GRI's Sustainability Reporting Standards).

The Organization for Economic Co-operation and Development (OECD Guidelines for Multinational Enterprises).

The United Nations Global Compact (the Communication on Progress).

The International Organization for Standardization (ISO 26000, International Standard for social responsibility).

3.2.1 Global Reporting Initiative

The Global Reporting Initiative (GRI) was founded in 1997 by Ceres which is an environmental NGO in collaboration with Tellus Institute. (GRI's History, 2017) their primary focus was to create a concrete framework that would help organizations by setting a clear set of rules and guidelines. (Molen, 2017). Since then, the Global reporting has been continuously developing these guidelines. The most recent one is called the GRI Standards. As of today, more than 95% of the world's largest 250 companies reports on their sustainability performance and about 85% of those companies are relying on the GRI reporting guidelines for their reporting (Initiative, 2017).

The most recent update was from GRI G4 to the new GRI standards was mainly focusing on transforming the guidelines into a modular design approach.

The main advantage that the GRI standards is its clarity and the comparative framework. The previous version of the framework used to have a problem in the translating of the date that the organization offers into a comprehensive presentation of the company's broad social impact (Jen Anderson, Jessica Abensour, 2017). The GRI has been aware of this issue and it released few updates to solve this problem, ending up with the new GRI Standards which offer a modular design, which has an intensive focus on the format and the presentation of the main content, concept, and disclosure (UN Global Compact Leaders' Summit 2016, 2016). It also contained other fundamental changed

1. A new digital format with multiple information sources.

2. New content requests focused on overall impacts to society and natural resources

3. A new role for stakeholders with increased access. According to the GRI (2016c).

The Sustainability disclosures and related data provide a rich overview of the help that the organization brings about to the climate change and the methods that are being used to decrease the contamination and help to protect the ecosystems and to the regional management of natural resources. The data will also disclose significant information about the quality of life (access to food and water, education, healthcare and civil rights) of all the individuals and communities which are involved in the organizations' operations.

The new GRI Standard was announced in the Fall of 2016. Companies started to adjust their reporting to satisfy the new framework' structure. The new standard helped in filling the holistic impact assessment. The new GRI standards has new measurement tools which have been developed to look more thoroughly at impact and outcomes, not just output.

3.2.2 The United Nations Global Compact (Communication on Progress).

The UN Global compact contains ten principles that organizations are expected to fulfill. These principles cover four different aspects of sustainability: Human Rights, Labor, Environment, and Anti-Corruption. It is estimated that there is more than 10000 business which participates in adopting these principles and another 5000 nonbusiness participants which also align with the UNGC and use it in their report to measure their performance.

These principles are:

Human Rights

Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights.

Principle 2: make sure that they are not complicit in human rights abuses.

Labor

Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.

Principle 4: the elimination of all forms of forced and compulsory labor.

Principle 5: the effective abolition of child labor.

Principle 6: the elimination of discrimination in respect of employment and occupation.

Environment

Principle 7: Businesses should support a precautionary approach to environmental challenges.

Principle 8: undertake initiatives to promote greater environmental responsibility.

Principle 9: encourage the development and diffusion of environmentally friendly technologies.

Anti-Corruption

Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery. (UN Global Compact Leaders' Summit 2016, 2016)

3.2.3 Sustainability Accounting Standards Board

Many organizations prefer to separate between their financial reports and the Environmental, social and governance reports. Many large socially responsible investors (SRIs) and advocacy groups are backing the integration processes between those types of reports through movement such as integrated Reporting and the Sustainability Accounting Standards Board (SASB).

The Sustainability Accounting Standards Board (SASB) started in 2011 in a determination to integrate material ESG topics into organizations' financial reports.

U.S. Securities and Exchange Commission has defined Material topics like those that have "a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having to significantly alter the 'total mix' of information made available" (TSC Industries, Inc. v. Northway, Inc., 426 U.S. 438 (1976), 2018).

The recession of 2008, gave an excellent reason for SASB to provide investors with a more comprehensive method to monitor their Organizations environmental, social, and governance performance. The SASB's 2016 primary goal was to release industry-tailored standards for 80 industries in 10 sectors. The standards aimed to list precise indicators which are considered most material to companies in each sector. The process of the Adoption to the SASB standards has been slow.

3.2.4 International Integrated Reporting Council (IIRC)

As a result of the increasing concerns of the traditional reporting being insufficient to the current information need of many different stakeholder (S., Fries , & Simnett, 2011) many organizations tried to work on improving the available information offered for stakeholder to assist them in making better decisions which are done by submitting their financial report along with the non-financial information (KPMG, 2011). The usual conventional approach for these organization to report their non-financial information used to be done by reporting through a variety of mechanisms which includes a standalone sustainability reporting system like the one offered by the Global reporting initiative, the other mechanism is by applying the concept of corporate social responsibility reports (CSR) or is done by the annual organization report (Cohen, Holder-Webb, L., & Wood, 2012).

Although the supplementary information has been proven to be very valuable and relevant the scope of the non-financial information included in such reports is usually considered to have a significant quantity of information which makes it hard to follow, as some sustainability reports reaches up to 200 pages in length (KPMG and Financial Executives Research Foundation (FERF), 2011)Additionally, the combination of the financial and non-financial reports are not delivered in a way that considers the stakeholder understanding of the company. Which results in reducing the value of the information provided by these reports (Clarkson, Y. , & Richardson, 2004).

The International Integrated Reporting Council (IIRC) was launched in 2010, and it suggested a solution to the reporting problem. The answer was for the organization to provide a clear link between the reported non-financial information and the financial information in a transparent way that allows the provided performance information of the company to be traceable in the future. The proposed method that the IIRC suggested for accomplishing such results is by creating a separate report (an integrated report) which helps in combining the financial and non-financial information that the organization has. The IIRC endorsed a certain process which the organization's value creation over a period would be reported in a concise report namely the integrated report. This report would allow the organization to communicate its strategy, governance, performance, and prospects, in a context of its external environment, to demonstrate the creation over the short, medium and long-term (International Integrated Reporting Council (IIRC), 2013a) (International Integrated Reporting Council (IIRC), 2013b).

3.2.5 UN Sustainable Development Goals

Another related framework UN Sustainable Development Goals (SDGs), It was launched by the UN in September 2015 as part of the global organization's 2030 Agenda for Sustainable Development (Sustainable Development Goals, 2017) These goals are considered as an update to the UN Millennium Development Goals (MDGs) which was announced in 2000. The goals mirror the far-reaching global aspirations for social justice and sustainable economic development through 2030.

These goals are mainly intended for nation-states. Still, they ask other organizations to get involved in the most significant global challenges of our time and play their role. The goals contain objectives like “end poverty in all its forms everywhere,” and “end hunger, achieve food security and improved nutrition and promote stainable agriculture.”
The United Nations, World Business Council for Sustainable Development, and the GRI have developed a tool called “SDG Compass: The guide for business action on the SDGs,” to help companies understand how they should interact with the SDGs (Goals, 2017). Their five steps are:

- Understand SDGs
- Define priorities
- Set goals
- Integrate into business
- Align with reporting and communications

Figure 1 Five Steps Diagram (sdgcompass.org)

For now, some early adopters are trying to showcase how various corporate social impact initiatives are aligned with particulars goals.

Many Several collaborations among different organizations are being initiated which includes the public and the private sector in an attempt to solve these substantial issues together.

As an example, Champions 12.3 is a coalition of executives from governments, businesses, international organizations, research institutions, farmer groups, and civil society dedicated to driving action to achieve SDG Target 12.3. That target is to, “by 2030, half per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.” Company members include executives from Tesco, Kellogg Company, Nestle, Rabobank, Sodexo, and Unilever (champions123, 2017).

3.2.6 Net Positive

Net Positive is a parallel movement that goes along with the other framework that measures the social impact. Net Positive aims to calculate the social and economic advantage than an organization or its products have to the society. No Positive is mainly driven by organizations such as Business for Social Responsibility, Harvard's SHINE project, and Forum for the Future.

According to the Forum for the Future, "Net Positive is a way of doing business which puts back more into society, the environmental and the global economy than it takes out" (David Bent, Sally Uren, Zoe Le Grand, 2016). These organizations seek to deliver help to the establish methodologies through which organizations might measure their overall impact on the society. Some of the organizations which are participating in this effort are AT&T,1 BT, Dell, IKEA, and Unilever. This movement is still in its early stages, and there are many more questions than answers. Some of these questions are about the general trend toward measuring corporate impact include the following:

• How should a company define its impact? What are the boundaries?

• Should a company's "net impact" be broken down by issue (e.g., carbon emissions), or measured as an overall company impact?

• How should positive and negative impacts be measured and compared? How should companies account for trade-offs? (Jen Anderson, Jessica Abensour, 2017)

3.3 Current status of sustainability reporting standards

The World Commission on Environment and Development (WCED) has begun initiating the essential principals of sustainable development since the late eighties. It started by defining it as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs." (Development, 1987)

The help to set the goals of sustainable development came as a result of the association of the (WCED) with other organizations which offered the feedback needed to evaluate what steps to make to achieve the desired sustainable development's goals. This made these participant organizations play an essential role in the development process.

Sustainability reporting, as promoted by the GRI Standards, is an organization's practice of reporting publicly on its economic, environmental, or social impacts, and hence its contributions – positive or negative – towards the goal of sustainable development. (SUSTAINABILITY REPORTING, 2017). this procedure helped the organization to define the impacts that it has on the economy, environment, and society then releasing reports about them that satisfy a globally-accepted standard.

The GRI Standards set up a common platform which organizations can use to calculate the impact that they have in a language that is shared and understood by other organizations. This helps organizations to set up their goals and made their impact comparable to other organizations which are reporting using the same standards. This helps in achieving a better transparency and accountability of organizations.

Reports which use the GRI standards as its reference standards should offer a stable and rational illustration of the organizations, whether these reports are showing a positive or negative impact on the goals which are set to achieve the desired sustainable development.

The advantages that are gained concluded by the reports help different stakeholders to make better decisions to support the organization in achieving a better sustainable development.

3.3.1 sustainability reporting standards necessity

The GRI standards offer the essential methods and rules along with a detailed execution guide to help organizations preparing their reports, despite the size of the organization, their area of business or their geographical location. The standards also offer an international reference to track the sustainability performance of organizations (environmental, social and economic). Which makes these reports substantial for any kind of research or study that requires such information.

The development GRI standards process is done while making sure that a real-life organization from different organizations from different sector and regions are involved in the development process. These organizations depute representatives, which would finally form a huge assembly from a wide variety of sectors, such as Banking, human rights organizations, financial markets, labor, as well as inspectors and experts in various fields, those representatives are in reality the ones who are in close dialogue with regulators and governmental agencies worldwide. Which ensures that the standards are being developed in alignment with an internationally recognized reporting standards and agencies. This gives the GRI standards a high level of acceptance and makes it globally trustworthy.

3.3.2 Targeted audience

Each year Thousands of companies and organizations from different sectors release their sustainability reports. These organizations spread all over the world. Many of them use the GRI sustainability standards as a baseline to their reports.

Beside companies and private organizations, Public sectors and NGOs also participate in sustainability reporting. Which helps the GRI's Sustainability Disclosure Database to contains all known GRI-based reports.

3.4 Reporting Advantages

For the reporting procedure to be successful, the data collection process should be systematic and consistent, with efficient methods of communication and replies. Which if done correctly it would have a massive benefit to the organizations both internally and externally.

An efficient sustainability reporting cycle, which includes a regular program of data collection, communication, and responses, should benefit all reporting organizations, both internally and externally.

Internal Benefits:

Internal benefits for companies and organizations can include:

- Increase the understanding of risks and opportunities.
- Emphasizing the link between financial and non-financial performance.
- Influencing long-term management strategy and policy, and business plans.
- Streamlining processes, reducing costs and improving efficiency.
- Benchmarking and assessing sustainability performance concerning laws, norms, codes, performance standards, and voluntary initiatives.
- Avoiding being implicated in publicized environmental, social and governance failures.
- Comparing performance internally, and between organizations and sectors. (globalreporting, 2018)

External Benefits:

External benefits of sustainability reporting can include:

- Mitigating – or reversing – negative environmental, social and governance impacts.
- Improving reputation and the brand loyalty.
- Enabling external stakeholders to understand the organization's true value and its tangible and intangible assets.
- Demonstrating how the organization influences, and is influenced by, expectations about sustainable development. (globalreporting, 2018)

3.5 Challenges & Risks

The advantages that a good sustainability management has offered to a wide variety of organization made it clear for the other organizations that are considering the utilization of sustainability management that they need to make some changes to within the company and its operation process, these changes have to be manifested in different areas such as the technologies that the organization is currently using, the processes that the organization follow, the overall organization culture, and the management. Utilizing new technologies is needed to help the organization reduce its negative environmental impact, this can be done by studying the materials that are being used during the production process and also the energy consumption which has a direct impact on the emissions that the production process generates. (EFFRA & Manufuture-EU, 2013) In regards to the processes, organization are currently focusing on the end-of-pipe technologies to reduce their negative environmental impact but utilizing a good sustainability management system help the organization to reduce these negative impacts in every phase of its production process.

These changes could, for example, concentrate on the efficiency or the increasing recycling of waste materials. Lastly, the effect that sustainability management has on the organization culture and its management should be observed as a method to increase the company's competitiveness rather than as a source of additional costs. This means that sustainability management should play a central role in the company's strategy, and decision-making (Michael E. Porter, Claas van der Linde, 1995) (Association, 2007). An example to increase the role of importance of sustainability within the company and also among the relations to its stakeholders is to have a precise measuring and reporting mechanism that is directly focused on sustainability which shows its result and performance. (Environment, 2001) GRI standards have created a set of key metrics to be used by organizations. (Rivera, 2013).

3.6 CSR Impact Measurement Fundamentals

The Corporate social responsibility of organization is a place that we can observe some noticeable changes for the impact measurement of the organization. These changes are due to the demand of such a measurement both internally and externally. Nongovernmental organizations play a predominant role in these as they try to watch over the different sector of businesses, another factor came from inside as the stakeholders would like to have a better image on their return on investment. Also, the modern market with its high expectations leads to drive organizations to invest more in knowing what role they are playing in the society.

The measurement can be applied to the Corporate social responsibility of the organization whether its primary focus is on social aspects like education and poverty. Or even if it is more focused on the environmental issue, like co2 emission, alternative energy and so on. And for the program to be effective, the Corporate social responsibility impact measurement

must follow some critical principles and quantifiable metrics that offer the needed help to track the progress of the program.

There are five key principles for the Corporate social responsibility impact measurement:

1. Involve others: Don't go it alone. Ask internal and external stakeholders to help along the way.

2. Start with objectives: Identify the social and business objectives first. Use those objectives to help make decisions about what can be measured.

3. Focus on what the program can truly impact: Don't spread the program too thin.

4. Be transparent: Transparency brings credibility. If a CSR program is not driving the impact expected, be up front, find out why and change course.

5. Have others substantiate: Ensure partners or independent third parties validate results. (Jen Anderson, Jessica Abensour, 2017).

3.7 From Inputs and Outputs to Outcomes and Impacts

There are multiple impact measurement frameworks that can be illustrated in four phases. Still, we have to keep into consideration that this framework might vary. We have to keep in mind the previously mentioned five principles of Corporate social responsibility, but generally, it is agreed that organizations can measure their impact through these four steps (Jen Anderson, Jessica Abensour, 2017)

3.7.1 Identifying Social Objectives: starting off with the social impacts goals, the Corporate social responsibility should discuss the challenges that face the program, whether they are social, environmental or community challenges. An example can be given to that as improving education, job skills, nutrition, or even water quality for specific population groups or geographic area. Although, the more detailed and specific the goals are, the more apparent the path to measuring the impact.

3.7.2 Making the Business Connection: typically, the objectives of for-profit organizations are more connected to their vision on the matters that concern the organizations the most. There used to be a general agreement that it is a bad practice to display the relation between philanthropy and business strategy publicly. There used to be a clear division between business and philanthropy practices of an organization. But this concept has been changed today as the organizations are expected to play a good role in the society and solve the social problems that are facing the surrounding beyond the organization's walls. Now it's agreed that the philanthropy practices can and should come back well for the business by establishing business goals that are related to the Corporate social responsibility. However, these goals are not always clear to identify and work on. Organizations often struggle to define business return on investment that can be related to beneficial social impact programs which go beyond improving the organization's reputation. A survey done by KPMG of 4100 organization around the world (KPMG, 2013), the top five business opportunities most often cited for engaging in CSR activities are:

- Innovate new products and services
- Strengthen brands and corporate reputation
- Improve market position/growing market share
- Drive cost saving
- Improve employee motivation

3.7.3. Setting Specific Program Goals: Now that the connection is clear and the goals are identified, integrating these goals into a Corporate social responsibility measurement strategy. This help the organization to be able to track their progress, as setting up clear goals helps that they are measurable and that what is being measured is aligned with what the Corporate social responsibility program intends to achieve.

Over half of Fortune 500 organizations have goal platforms, and the clearer and determined the goals, the more they can set organizations apart for their Corporate social responsibility leadership.

Elements of strong CSR goals include the following:

- Concrete: Set tangible, actionable deliverables derived from societal and business objectives.
- Long Term: Multiyear goal platforms demonstrate future vision and a sustainable direction for the company.
- Transparent: A company must be confident publicly sharing the goals and reporting progress toward reaching them.
- Measurable: It's not enough to be qualitative with results; show quantifiable results using absolute figures and data over general statements. (Cronin, Mary J, Dearing, Tiziana C. (Eds.), 2017).

3.7.4. Develop Metrics: The next step would be to track the progress of the organizations' social impact. This is done by using the impact framework that includes different categories covering different perspective: input, output, outcome and the impact (Jen Anderson, Jessica Abensour, 2017).

- Inputs: Money, time, and in-kind giving you bring to the table.
- Outputs: Direct result from an activity, usually answers the question "how many."
- Outcomes: Changes that result from an activity; often in # or % increase/ decrease.
- Impacts: Determine both societal and business impacts using third-party data and research. (Jen Anderson, Jessica Abensour, 2017).

Figure 2 Four-Step Process for Impact Measurement (ABENSOUR, J. L)

The following Table demonstrations a sample worksheet which was developed by VOX Global. This worksheet explains the factors that the organization should consider when executing the four-steps measurement process

The scale which determines the achievements that the societal goals have managed to accomplish and this should be measured by determining the impact that the organizations' CSR program has and not by the amount of money that the organization is willing to offer in the contribution the achieve their CSR goals. Also, the workforce and the working hours that the organization's employees contribute won't be an accurate way to measure the impact, and lastly the in-kind product that the organizations donate.

Applying an impact framework will assist the organization to recognize and track the data points correctly, it will need to comprehend the full impact and to tell a convincing and trustworthy impact story.

Nike Inc. summarizes this strategy in its 2015 corporate social responsibility report: "We recognize that lasting change requires more than investment. It requires results. That's why we aim to measure the social impact of our community investments. We aim to move away from measuring inputs and outputs alone" (Nike, 2017).

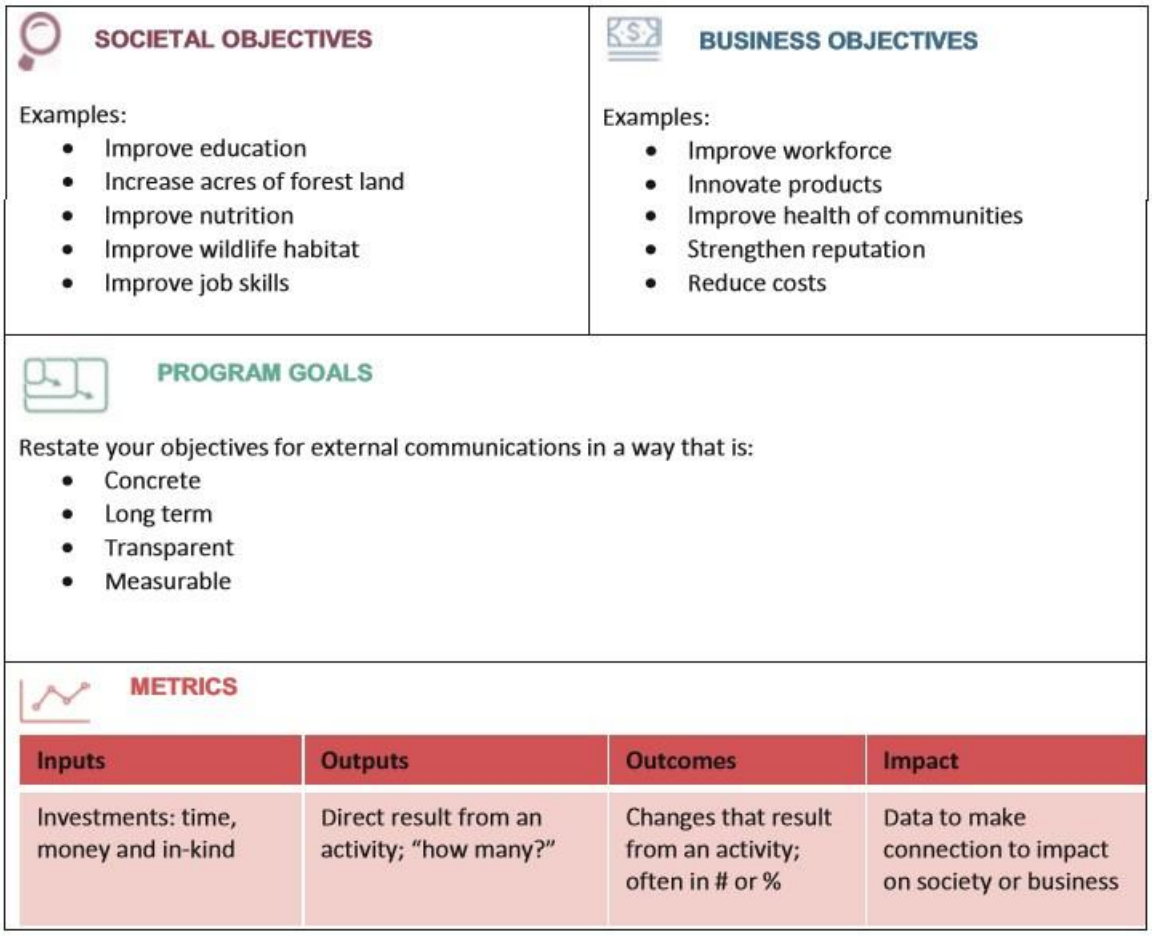

Figure 3 Sample Worksheet for The Four-Step Measurement Process Cronin (Mary J, Dearing, Tiziana C. (Eds.). (2017))

3.8 Creating Shared Value Between Organizations and The Society

For the CSR to be an essential factor positive reputation, it should be authentically aligned to the organization's business strategy still, offers a secured approach to achieve the goals of corporate stakeholders.

Organizations have many methods to ensure the connection between these factors.

For example, in 2016 Microsoft Philanthropies announced that it would donate $1 billion in cloud computing resources to serve the public good. "Microsoft is empowering mission-driven organizations around the planet with a donation of cloud computing services — the most transformative technologies of our generation," Satya Nadella, Microsoft CEO. (Microsoft Philanthropies announces commitment to donate $1 billion in cloud computing resources to serve the public good, 2017).

Specific elements of the new initiative include these:

- Serving the broad needs of the nonprofit community.
- Expanding access to cloud resources for faculty research in universities.
- Reaching new communities with last-mile connectivity and cloud services.

Such contributions would indefinitely benefit Microsoft by ultimately leading to innovation and market growth as these products and services are brought to market. And at the same time offering these services would provide a great benefit to the society.

On the other hand, organizations like chocolate manufacturers and coffee retailers, with a supply chain that works in developing countries, have an increasing interest in serving the communities where they get their raw materials from. These companies tend to offer training and education to the communities they are working with, and at the same time, they try to minimize their environmental footprint.

Such examples make it easier to observe the evolution of philanthropy and CSR towards a shared value model, where both the society and the organization's benefits are being considered at the same time through CSR and broader company efforts.

3.9 Business Benefits

Reporting an organization environmental and social impact has many benefits of the organizations that pledge to measure their corporate social responsibility. The measurement methods and tools support the business growth in these following ways:

Resource Allocation: The materiality assessment tools give a massive advantage for participated organizations as it offers valuable information that helps the organization to allocate the resources to addresses their Environmental, social and corporate governance performance (ESG). The date provided by these reports can help the organization to observe their whole environmental and social performance and impact more efficiently.

Stakeholder's Opportunities: Stakeholders expect their organization to take into consideration the environmental and social impact and performance. This concept has become more widely expected than just a competitive advantage for the elite organizations, but also a requirement. Stakeholders realize that organizations don't do their business in isolation, but that the whole business process has a direct effect on the society.

Organization's Reputation: The way the organization treats its personnel has an increased impact on the corporate social's reputation. According to 2014 report by Reputation Institute, corporate social responsibility subjects make up more than forty percent of the consumers' opinions about an organization's status. Although the product and service that the organization offer is essential to its reputation, but of the organization doesn't have robust corporate social responsibility initiatives, the status of that organization is likely to be affected (Kliger, 2014).

Employees: organization aims always strengthen their employee's engagement as it has a direct impact on the general atmosphere of the organization and it helps to enforce the emotional commitment to the organization. Hence, organizations are always trying to give extra attention to their environmental and social initiatives. The result of such philosophy helps the organization's employees to be willing to add more to the organization as they become more involved to its goals. Organizations now are more willing to give their employees the more discretionary freedom to do their tasks. The more they become more committed.

Many types of research have shown that the positive social impact of an organization is valued by its employees regardless their experience and age groups, although this has been more visible when observing the millennials, as they tend to prefer working for an organization that gives attention to its environmental impact. The study shows that 65 % of the Millennials who are already in the workforce say that their employer's social/ecological activities make them feel loyal to their company (Cone Communications, 2009)

Furthermore, employees who are allowed to be more involved in the organizations are more likely to support their organization when a crisis occurs. How a company treats its employees influences its reputation, ultimately affecting its bottom line.

Corporate sustainability reporting continuously growing and evolving. Stakeholders are seeking to understand a full organization impact on the economic, social, and environmental. Organizations can use several reporting tools to assist them in finding the answers. The benefits of corporate reporting and measuring for impact are broad, and organizations that start now will have a huge competitive advantage as this trend continues into the future.

The economic dimension of sustainability concerns the organization's impacts on the economic conditions of its stakeholders and economic systems at local, national, and global levels. It does not focus on the financial situation of the organization.

4 GRI Sustainability Reporting

4.1 Introduction

Global Reporting Initiative has established its development in the topic of sustainability reporting since the late 1990s. It plays a major role in setting its practices and helping the organization to adopt its standards. The GRI Standards is considered to be the most reliable and most recognize sustainability reporting standards worldwide.

GRI Sustainability Reporting Standards (GRI Standards) assistance industries, establishments and other organizations to recognize and interconnect the influence of business on critical sustainability topics. Some of the characteristic fundamentals of the GRI Standards – and the activity that creates them – include:

Multi-stakeholder input: GRI utilizes a multi-stakeholder approach to ensure that they are showcasing the best assembly of technical knowledge to emphasize the importance of report makers. This method allows GRI to be globally accepted and relevant. All the fundamentals of the reporting system are designed to be widely accepted to many possible use scenarios from the stakeholders, business, civil society, labor, accounting, investors, academics, governments, and sustainability reporting practitioners.

A record of use and endorsement: Of the world's largest 250 corporations, 92% report on their sustainability performance and 74% of these use GRI's Standards to do so. With over 23,000 GRI Reports recorded in our database, still, the number of organizations that are using the GRI standards for their reporting is rapidly increasing. New organizations and sectors are now considering the best practices in sustainability to increase their performance. The number of reports that are being submitted every year continues to increase, which helps to achieve the goal of having more reports with a higher quality. (GRI AND SUSTAINABILITY REPORTING, 2016)

Governmental references and activities: issuing laws and regulations is an essential part of enforcing the use of sustainability reports. Currently, there are more than 35 countries that use GRI in their sustainability policies and use it as their guidelines. Which makes the GRI standards to be considered as the most widely recognizable sustainability reporting system worldwide. Furthermore, GRI has strong relations with more than 20 international organizations such as the UNGC, OECD and the UN Working Group on Business & Human Rights.

Independence: GRI is a non-profit foundation with a business model that aims for a degree of self-sufficiency. Funding is secured from diverse sources; governments, companies, foundations, partner organizations, and supporters.

Shared development costs: The expense of developing GRI's reporting guidance is shared among many users and contributors. For companies and organizations, this negates the cost of developing in-house or sector-based reporting frameworks.

4.2 History of the Global Reporting Initiative

Global Reporting Initiative was founded in Boston USA in the year 1997. Its foundation was based upon the Coalition for Environmentally Responsible Economies (CERES) and the Tellus Institute which are a non-profit organization based in the united states. The United Nations Environment Program (UNEP) also participate in the creation of GRI as we know it today (Halina Szejnwald Brown, 2009).

The initial concept of the framework was created by the former CERES Executive Director Dr. Robert Massie and acting Chief Executive Dr. Allen White who had their vision to create an environmental reporting framework in early 1990s. This vision came into existence later on with the main focus on creating a reliable mechanism for investors which can be followed to help them in creating their organization's environmental reports. This framework was primarily based on the CERES Principles for responsible environmental conduct.

The initial concept was modified in 1998 to cover other aspects beyond only the environment. GRI started the process by starting a multi-stakeholder steering committee which was responsible for developing the organization guidance. The framework aimed to cover broadened the scope and to include social, economic and governance issues. The final GRI's guidance turns out to be the Sustainability Reporting Framework with reporting guidelines in its core. The first version was ready to release in the year 2000, and it offered a comprehensive framework for sustainability reporting. the following year, the GRI steering Committee advised converting the Global Reporting Initiative to separate and independent non-profit Institute.

4.2.1 Global Reporting Initiative GRI G2 (2002-2006)

The year 2002 carried a lot of events for the Global Reporting Initiative, as the GRI decided to move its headquarter to Amsterdam, where the Netherlands was formally inaugurated as a United Nations Environment Programme (UNEP) collaborating organization in the presence of then UN Secretary-General Kofi Annan.

The same year was also the year when GRI issue its second generation of the guidelines which were called GRI G2. It was released at the World Summit on Sustainable Development in Johannesburg, South Africa. The GRI was also referenced in the World Summit's Plan of Implementation.

The GRI committee grants a greater part of their supporter by launching its Organizational Stakeholders Program (OS). This program game their supporters a more significant part of allowing them to put their names to GRI's mission, and contributing with their opinions and expertise, this step helped these organization to play an implant governance role and also helped the Global Reporting Initiative through the annual financial contributions. This program contained companies and organizations which came from the different business sector and industries like from civil society, business, mediating institutions, academia, labor, public agencies and intergovernmental agencies.

Also during the year 2003, the first meeting of the GRI Stakeholders Council(SC) was held. It aimed to give the stakeholder a formal policy forum which the GRI can manage. The stakeholders provided their contribution by advising the board on the strategic issues. The stakeholder council was responsible for appointing its board members and suggest their recommendations on the future policies, business planning, and activities.

The next big milestone for the GRI was in the year 2005 when the GRI Technical Advisory Committee (TAC) was initiated to offer help for the GRI's board and secretariat in the process of maintaining the general quality and coherence of the framework by offering an advanced level of technical advice and expertise.

4.2.2 Global Reporting Initiative GRI G3 (2006-2011)

This GRI's framework continued to gain more recognition and led to an increase in the demand for the GRI's sustainability reporting guidance the new version of the framework was released in the year 2006 and by this point the framework has already secured a huge audience it is estimated that over 3000 experts from business, civil society, and the labor movement contributed to G3's development, which shows the true multi-stakeholder approach at the core of GRI's activities.

In the same year, the GRI was able to hold its first global conference on Sustainability and Transparency, in Amsterdam called "Reporting: A Measure of Sustainability.". There were 1150 participants from 65 countries, representing business, financial markets, civil society, labor, government, assurance providers, and municipalities. And it is estimated that half of those participants came from Europe and North America, while 250 other participants came from 37 developing countries.

After the promotion event of the third version of the GRI framework, G3, at the Global Conference, the GRI started to concentrate more on its strategy and Reporting framework, by strengthening their association with their partners. The GRI also announced new partnerships with United Nations Global Compact, the Organization for Economic Co-operation and Development among others.

2007 saw the release of GRI's learning publication: Pathway 1. This was driven by the fact that a focal point for the GRI is its publication and its quality. Educational Institute and research facilities publication are regularly issued by GRI, and most of the time this contribution comes in collaboration with an academic institution. The GRI's learning publication: pathway 1 mainly focused on providing a detailed guideline for reports maker and user of all levels and background. The GRI also Issued in the same year the United Nations Global Compact UNGC- GRI linkage document: Making the Connection. This report helps in providing a detailed and comprehensive guild for linking between GRI based sustainability reporting with the annual Global Compact Communication on Progress.

The GRI also started setting up many regional offices to help to spread their presence in important areas. The first Focal Point was launched in the year 2007 in Brazil.

The GRI was also able to start its Application Level Service, which was a new drive aimed to provide companies and organization with a guideline to help them check their sustainability reports and help in determining the required set and number of disclosures to meet the organization's self-declared Application Level.

The year 2008 saw the release of the GRI first Sector Guidelines, called Financial Services Sector (FSS). The sector guidelines aimed to focus on the special sustainability needs that different industries encounter and it was assembled by multi-stakeholder working groups.

The GRI also started a new association with Earth Charter as some key strategic partners and alliances to enhance the framework credibility. Earth Charter a declaration of fundamental ethical principles for building a just, sustainable and peaceful global society.

Earth Charter mission is to provide an ethical grounding for the GRI guidelines and explaining what the framework is, how could it help and shows the importance of taking care of the planet and its inhabitants for now and into the future. This collaboration with Earth Charter gives an ethical grounding for the framework, where GRI fits perfectly as it gives an operational guideline on how organizations and companies can report on their principals that are in the Earth Charter. As part of the alliance, GRI published a document detailing the synergies between the G3 Guidelines and the Earth Charter: The Earth Charter, GRI, and the Global Compact: Guidance to Users on the Synergies in Application.

GRI also released its Learning Publications: Pathways II. Along with two publications for

those organizations which are considering to start reporting their activities: Starting Points I and II.

The GRI expanded further by opening their second Focal Point in Australia.

The second Global Conference on Sustainability and Transparency called: Sustainability Reporting Today: The Readers' Verdict also took place and more than 1000 organizations, and company from 58 countries participate in the event with 148 speakers who took part of the event.

The Certified Training Partner Program was launched, and GRI first Certified Training Partner was recognized in Brazil. This program offers training on GRI and how to utilize the GRI Guidelines and conduct the training in the local language using examples from the same regions of the training center.

In 2009 GRI offered new services for GRI's users by introducing GRI software certification. The GRI Certified Software and Tools Program was launched. Its main goals are to ensure that GRI content in software and digital tools is accurately used. After completing the certification process, GRI grants authority to use its content in software or digital tool. This certification allows these tools to issues a Permission Letter which authorizes the content of the tool for the next 12 months. The software and digital tools are listed in the GRI Certified Software and Tools Directory.

The same year also saw the release of GRI Global Action Network for Transparency in the Supply Chain (GANTSCh) Program (later renamed Business Transparency Program – BTP). This program initially aimed to offer support for small and medium enterprises in their sustainability reporting, but GANTSCh has expanded its reporting capacity for members of the business and industry associations which helped in improving the economic and the sustainability performance in the local and scrotal business groups.

The GRI Featured Reports service was also launched in this year which Is a service that helps to promote the organizations' sustainability reports to the GRI network and beyond

GRI third Focal Point was opened in China. And GRI also released its new Sector Guideline: Electric Utilities.

The International Organization for Standardization worked with GRI in 2010 to release a publication together that help to combine between its ISO 26000 standard and GRI's guidelines, the publications called: How to Use the GRI Guidelines in Combination with ISO 26000, and Carrots and Sticks – Promoting Transparency and Sustainability.

In the same year, GRI also released two new Sector Guidelines that cover new sectors: Food Processing and NGO.

GRI's third Global Conference on Sustainability and Transparency: "Rethink – Rebuild – Report" also took place, there was 1200 participant from 77 different countries. This conference. During this conference, GRI established what is called A Memorandum of Understanding (MoU) with the UN Global Compact. The MoU contained within its articles a point that requested from GRI to integrate its guidelines with the Global Compact's ten principles and make these changes available by the time of the release of its the next version of Sustainability Reporting Guidelines. On the same time, the UN Global Compact would adopt the GRI guidelines as the suggested reporting framework for organizations to report on their activates.

A new GRI Focal Point was opened in India make it the fourth regional GRI Focal Point.

4.2.3 Global Reporting Initiative GRI G 3.1 (2011- 2013)

The new updated GRI version was released in 2011. It was called GRI G3.1 this version extended the gaudiness on reporting gender, community, and human rights-related topics. This year also saw the release of new Sector Guidelines that covers: Mining and Metals, Airport Operators, Construction and Real Estate.

A new project called GRI's Sustainability Disclosure Database was initiated, which contained a classification of all GRI based and non-GRI based sustainability reports which GRI is recognized. This database has been growing rapidly, and by the year 2016, it contained more than 24000 reports.

The GRI Report or Explain campaign was launched, aiming to advertise for sustainability reporting among organizations that are considering to drive sustainability disclosure as a mainstream management and accountability tool.

The fifth GRI Focal Point was opened in the USA to cover the North American region.

The first Australian Conference in Melbourne took place in the year 2012. There were 205 participants from 11 different countries. The GRI US Focal Pint hosted two conferences covering North America. One conference took place in St. Louis, Missouri, and one in Toronto, Canada.

Also in 2012, another conference was the Rio+20 United Nations Conference on Sustainable Development. GRI hosted a number of events during this conference, and it was a part of the Green Economy Coalition and the Corporate Sustainability Reporting Coalition led by Aviva Investors. During this conference, a number of leading governments agreed on supporting the paragraph number 47 of the Rio+20 outcome document 'The Future We Want'. Brazil, Denmark, France and South Africa formed the 'Group of Friends of Paragraph 47' to advance corporate sustainability reporting, and asked GRI and UNEP to support the group as its secretariat.

Three new Sector Supplements were issued: Oil and Gas, Media, and Event Organizers.

In the year 2013 GRI hosted its fourth global conference entitled 'Information – Integration – Innovation'. There were 1600 participants from 69 different countries

In the same time, GRI released the fourth version of its Guidelines.

4.2.4 Global Reporting Initiative GRI G 4 (2013-2016)

The GRI G4 release introduced new concepts such as Reporting Principles, Standard Disclosures and an Implementation Manual for the preparation of sustainability reports by organizations of any size or sector.

The GRI G4 Online was launched a later on in that same year, which is a free web-based tool presenting the complete content of the G4 Guidelines in a dynamic format for those already familiar with the Reporting Principles and Standard Disclosures of the G4 Guidelines.

This year also witnessed a new alliance between GRI and the United Nations Global Compact (UNGC) and the World Business Council for Sustainable Development (WBCSD). The goal of this new assembly is to initiate a new concept to help private sectors to improve their sustainability management and reporting by offering them a specialized guidance by delivering a view to global sustainable development goals and targets. This initiation was issued by the UN Secretary-General at the UNGC Leaders' Summit in 2013.

The sixth GRI's Focal Point was launched in South Africa in the same year.

GRI also introduced its Materiality Disclosures Service. This service helped companies and organizations to check their critical disclosures in reports based on the GRI G4 and help them to check whether their reports ties with their facilities and can be easily reached by readers.

In 2014 GRI launched its new Content Index Service, this service provides a variation service for the correctness and alignment of the Content Index of GRI g4 based reports. GRI also issued a new publication called 'Ready to Report' which main goal was to help in providing the needed assistance for Small and medium-sized enterprises (SMEs) and help them answering if the process of sustainability reporting is applicable for their type of business and then providing help with initiating the reporting process.

In December of 2014, the EU Directive on disclosure of non-financial and diversity information by certain large companies (amending the 2013 Accounting Directive), was active, which helped in boosting the demand for GRI's reporting framework.

GRI started to separate the governance structure for standard-setting by creating the Global Sustainability Standard Board (GSSB), the Due Process Oversight Committee (DPOC) and the Independent Appointment Committee (IAC)

GRI's reach in South America expanded further with the opening of a seventh Focal Point in Colombia.

In 2015 GRI issued new publication 'Defining Materiality: What Matters to Reporters and Investors (Part I)' which was a result of collaboration between GRI and the investment specialist RobecoSAM. This documentation discusses the materiality aspects from the reporter's perspective, by utilizing the data from two different sectors of the economy: Technology Hardware & Equipment, and Banks & Diverse Financials.

4.2.5 Global Reporting Initiative GRI STANDARDS (2016 -)

The last most reason version of the GRI guidelines was released in October 2016. It was developed by the Global Sustainability Standards Board (GSSB) the new GRI Standards allowed all organization to issue their report publicly on their economic, environmental and social impact. The new guidelines helped to show how the participating organizations are contributing towards sustainable development. The GRI standards are also considered to be a trusted reference for policymakers and regulators. It introduced the new modular structure which helps in the participant organizations' date to be up to date and relevant.

The new GRI standard kept all the main concepts and disclosures from the previous version guidelines (GRI G4) and also improved it by offering more flexibility to its structure, offering a clearer requirement, and a was written in a simpler language.

GRI also held its 5th Global Conference in 2016. Almost 1200 sustainability leaders and practitioners from 73 different countries gathered in Amsterdam to be inspired, spark new ideas and network, all with a common goal: to embrace the new era of corporate disclosure. Over 200 expert speakers from governments, NGOs, multinationals and innovative start-ups delivered engaging sessions and plenaries, providing a host of perspectives and approaches to sustainability issues and the future of corporate disclosure.

4.3 Measuring organization's Impact using GRI

The GRI require the organization to provide certain data and information about its activities. These data include economic, environmental, and social performance.

These data are categorized into two groups the first one is a general standard disclosure and the second one is topic-specific performance indicators.

- All organizations must do general standard disclosures. It contains data about the organization's financials, employees, stakeholder engagement, and governance.
- Topic-specific performance indicators have three subcategories: economic, environmental, and social. Each subcategory consists of a collection of Aspects or topics.

The involved organization must submit a report on a set of defined data points under each of the Aspects that are considered "material," to the organization. Organizations use a (materiality assessment process) to define these topics. It's worth mentioning that the GRI definition of materiality required a special study as it is not the same as the SEC definition of Materiality.

The GRI report should secure small but significant elements. It also should follow a precise terminology to be considered as a complete report by the GRI. The managers should decide at an early stage who would implement the reporting by receiving the training on the framework or work with a partner that has received the training previously. There are seven clear steps on how the GRI report should be approach which can be listed as the following:

1. Identify stakeholders.
2. Ask your stakeholders which economic, environmental, and social topics are most important to the company.
3. Ask internal leaders which economic, environmental, and social topics are most important to the company.
4. Using the feedback, systematically create a list of the most important ESG topics.
5. In a GRI table, disclose prescribed data for each topic that is considered most important.
6. In the same form, disclose additional data required by the general standard disclosures.
7. Many companies also write an additional narrative that brings the data to life and highlights important milestones for the company in the reporting year. The GRI data and narrative combined comprise a company's Corporate Social Responsibility Report. . (Cronin, Mary J, Dearing, Tiziana C. (Eds.), 2017)

4.4 Using Software and Digital Tools to create GRI reports

The GRI G4 framework is supported by external platforms that help stakeholders writing their reports. These platforms offer an interface and tools for organizations that can assist erasing the ambiguity that the stakeholder might face during the development stage of the organization's report. These platforms usually include materiality assessment and stakeholder mapping, as well as value chain mapping.

4.5 Materiality Assessment and Stakeholder Engagement

The Organizations that are willing to issue a GRI reports are required to deliver a materiality assessment. The processes of measuring the materiality assessment of an organization are being done by contacting both internal and external stakeholders to inquire about their environmental, social, and governance subjects that are most relevant to their area of business.

The outcome of the inquiry is a collection of data that can be charged based on rank on two axes: the significance of the material to the external stakeholders and the significance of the material to the business (which is graded by internal stakeholders). A materiality assessment is an essential requirement of GRI reporting. And at the same time, it has a direct benefit to the organization that helps it to comprehend and identify in which area it has the most significant impacts. Depending on the results of the materiality assessment, the organizations will gain the ability to prioritize resources accordingly.

Before completing the materiality assessment, the organization must carry out a stakeholder mapping exercise to help in identifying which stakeholders are most important to the organization, which helps into identifying to whom to reach out to in the assessment. The groups that should be considered are current and future employees, policymakers/regulators, advocacy groups, general consumers, business customers, supply chain, and academics.

4.6 Value Chain Mapping

The GRI reports offer another important tool, the value chain mapping. By applying this exercise, an organization is requested to map its organization's entire impact—from raw materials to disposal. During this process, the organization gets the advantage to develop a deeper understanding of how its value chain looks like and can also indicate where their most material topics exist which propose a great advantage for the organization.

4.7 Metrics

The GRI has a very significant advantage as it offers organizations with a well-defined framework of metrics that they can help them to better understand the impact of their processes within specific topics, such as energy, biodiversity, occupational health and safety, and supplier human rights. Measurement leads to better understanding and equips organizations to react and to take action accordingly.

4.8 Measuring the Impact

Although the GRI and its tools and frameworks can be extremely beneficial in assisting organizations to understand their full performance and reach, the GRI indicators are not settled enough yet to naturally be decoded into measuring outcomes or impacts. Rather, they focus on outputs. And for this reason, the importance of using impact framework is helpful. Measuring impact over outputs allows organizations to recognize their impact better and connect it to key stakeholders.

For example, instead of a pharmaceutical company announcing its intention to donate money to combat malaria, imagine that same company announcing that it had cured or dramatically reduced the incidence of malaria in a certain location. This positive outcome would be a much more powerful story. The social impact of curing a debilitating and chronic disease would itself be an enormously positive step toward achieving the UN's Sustainable Development Goals. Such a breakthrough would garner widespread media coverage and resonate with policy officials, consumers, or whatever key audience is most important to that company. But, in order to tell that story authentically, companies must be in a position to track the return on their investment all the way through to outcomes and impacts. (Jen Anderson, Jessica Abensour, 2017).

4.9 Reporting Principles

The Reporting Principles identify the essential concepts for the organization to be able to get a high-quality sustainability reporting. There are some steps that an organization should follow for their reports so that these reports can be entitled as GRI Standards compatible.

The Reporting Principles are divided into two different sets of principles. The first set is the principles concerning the report content. The other one is the principles concerning the report quality.

The Reporting Content's Principles let the organization choose what contents are most relevant to their business to include in their reports. This may vary based on the organization's activities, impacts, and the substantive expectations and interests of its stakeholders.

The Reporting Quality's Principles help in identifying the quality of the information. This includes the information the report offers along with the quality of presenting this information.

A good quality information helps the stakeholders to define the current organization status and enable them to make decisions that would help the organization reaching its goals.

The reporting principles offer a set of tests that can be applied to measure the quality of the reports. These tests are not a part of the reports itself there is no need to be reported. (Initiative, 2015)

Reporting Principles for defining report content	Reporting Principles for defining report quality
• Stakeholder Inclusiveness • Sustainability Context • Materiality • Completeness	• Accuracy • Balance • Clarity • Comparability • Reliability • Timeliness

Table 1 Reporting Principles (nitiative, 2015)

4.10 Main Improvements in GRI Standards

- **Modular Design:** The new GRI standards are structured as a set of diverse modular, these modular have an organized structure which keeps them interconnected between each other. Together they make up the previously introduced principles from the previous GRI guidelines and their implementation manual. The Standards consists of three different universal standards and three topic-specific Standards.
- **Clearer Requirements:** the new GRI standards offers a new presentation of the requirements along with a new more comprehensible script that makes it easier to differentiate among requirements, recommendations, and guidance.
- **Clarifications:** significant concepts and disclosures from previous versions have been updated to become more simplified and easier to understand. This is done by clarifying the topics limits, how to collect and submit data related to a certain topic which is not covered by the standards, and a more specific language use to differentiate between related aspects like employees and workers.

- **Restructured Content:** some contents from the previous versions have been combined or unified into other segments which help to reduce the complexity and redundancy while improving the consistency of the standards.
- **More Flexibility:** the new standards give the user more flexibility to use the standards by helping them to be able to create their reports according to the GRI Standards while giving them the chance to choose the standards that are related to their business sector.
- **Continuity:** The essential ideas from the previous Standards have been passed to the new GRI standards, and there was no need to fundamentally make a complete change to certain aspects like for example the essential reporting principle, the reports that are more aimed at the administrative staff or the importance of reporting only on the material subjects. This will help the organizations which are already using previous versions of the standards to carry along and lessen the workload needed to transfer to the new standards.
- **General editing:** some aspects of the previous standards have been modified to grant a simpler terminology.

4.11 Transition process from G4 to GRI standards

The GRI sustainability report is considered to be the first global standard for sustainability reporting. While The G4 Guidelines are the most commonly used sustainability reporting guidelines in the world. In 2016 The Global Reporting Initiative (GRI) has released the GRI Standards which was developed by the Global Sustainability Standards Board (GSSB). The GRI standards make the next step in its development to be the Transitioning process from it the current format that is being used to the new modular approach which is used in the GRI Standards. Most of the changes focus on the format and presentation of the standards while the main content, concepts, and disclosures from G4 carry through to the GRI Standards. This mechanism ensures that the transitioning process will enable the GRI Standards to remain up-to-date with the latest sustainability developments in the future and to be open to any new reporting topics which will help the GRI Standards to be more broadly referenced by organizations around the world.

The GRI standards were developed following The Global Boundary Stereotype Section and Point (GSSP) dual process protocol with extensive input from diverse set of stakeholders which make them credible and robust set of standards that were developed with the public interest in mind

GRI standards Sustainability reports consist of 3 universal standards that make the sustainability report. Then there are three series of topic-specific standards which cover economic, environmental and social impact.

The starting point for using the standards is the GRI 101 foundation it concentration describing how to use and reference a set of standards, and explain how to prepare an export that is in accordance with the standards.

The GRI 102 General disclosure is for reporting contextual information about the organization and the reporting practices.

The GRI 103 management approach is for reporting the method used to report the material topic, it is used with each topic-specific standard (economic, environmental or social) to explain why the topic is material and where does its impact accrue.

(GRI, 2017)

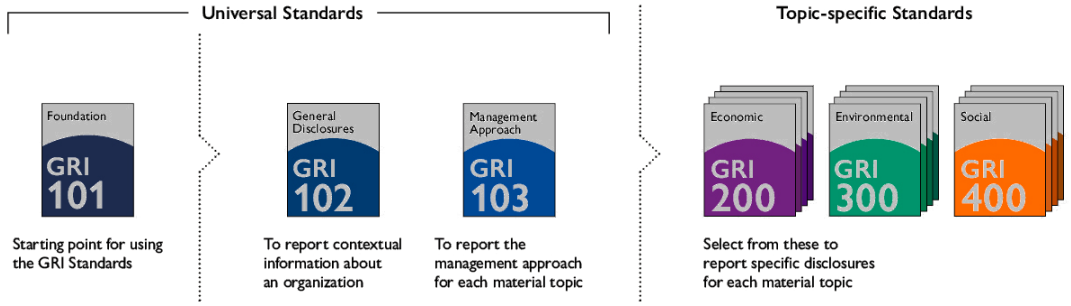

Figure 4 GRI Standards Modular Design (GRI. (2017))

Each GRI standard has a similar structure with a clear distinction between reporting requirements, recommendation, and guidance and it helps to know what to report and how to report it.

The GRI standards are based on the main content of the G4 the content from the G4 guidelines and the G4 implementation manual have been brought together to the standards which would help in finding guiding and example next to the disclosure they are related to rather than consulting a separate implementation manual.

The contents of The GRI standards have been restructured into separate modules that are also divided from a set of standards, this standard structure means that the standards can be updated independently and a new standard can be added without revising the whole set of standards, this will help the investing in GRI reporting as the standards will be responsive to new development and stay up to date and relevant for reports.

The GRI standards provide a single solution for a range of sustainability reporting needs they offer a comprehensive framework for a common set of disclosures for an organization to report on a full set of their material topics. In the same time, the GRI standards allow more flexibility within this framework to enable on a specific environmental or social issue.

The changes from the previous GRI4 allows the standards to be referenced more proudly by government and market regulators around the world which would help to enforce more credible sustainability reporting

With all those changes, a big challenge rises to the companies that are currently using the GRI 4 and willing to update their reporting practices to satisfy the new GRI standards.

4.12 Validating reports before the final submission

Before submitting the organization's report, the final version of the report must be reviewed by an external certified consultant who can judge if the report complies GRI guidelines.

This includes the outcome and the quality of the organization's process for defining report content and also the report itself, including its identified material Aspects and Boundaries.

The other option is to utilize an Enterprise Sustainability Management (ESM) which already offers the required tools which can help the organization to provide their data using a certain structure that ensures that the final generated report would comply with the guidelines.

The Global Reporting Initiative does not review the outcome of the final report, but on the contrary, the GRI rely on the stakeholders; assessment and their feedback as the key elements of the reporting process. The quality of the reports relies completely on the process of identifying the stakeholders and engaging with them. This process is essential to guarantee the report is suitable for all the stakeholders since that the systematic stakeholder engagement enhance the stakeholders' receptivity and the usefulness of the report.

The boundaries of the report for each material aspect should be identified based on the impacts that make an Aspect material can occur within or outside of the organization, or both. The Guidance for this process can be found in the G4 Implementation Manual under General Standard Disclosures G4-18, G4-20 and G4-21.

When the guidelines are Executed properly, it is likely to result in ongoing learning within the organization and by stakeholders, and increase accountability to a wider range of stakeholders, strengthening trust and credibility.

5 Development of the environmental and sustainability reporting

The In the early years – in the late 1980s and early 1990s – companies started to report on non-financial issues. They often prepared smartly polished brochures and documents focused on environmental issues. As the field matured, however, it then became apparent that a narrow perspective exclusively concentrated on environmental issues ignores at its peril important interrelations with economic indicators and social aspects. (Ralf Isenmann, Monika Beisel, Jan Brosowski, Jorge Marx Gomez, 2014) At that early stage, the Main form of communication used to be available only as printed material. Currently, most organizations make their reports available on the world wide web. As the internet has become the most popular reporting medium because of the technological advantages that the ICT architecture offers. Today, most of the companies issue their environmental and sustainability reports by using software and digital tools, which also offer the option to create a hard copy report which can be generated by the same software or digital tool. Different companies and organization now realize that the initial period (Deloitte Touche Tohmatsu International, 1993) when the environmental and sustainability reports started to get attention from the public not just for their existence but also for the proven benefits and advantages that a company or an organization could get from them.

Organizations and companies are becoming fully aware of the importance and benefits of environmental reporting. Stakeholders are also being innovative in finding new ways to make more use of these reports. Therefore many companies are leaving the outdated methods that they used to work within the early stages of sustainability reporting and moving into a more advanced reporting approach. The most preferred approach is the Triple Bottom Line or TBL (People, Planet, Profit) this approach covers the three main pillars of sustainability reporting Environmental, Social and Economic. The continues and fast development in this evolving field could be described along a path regarding five-stage- model (Figure 1)

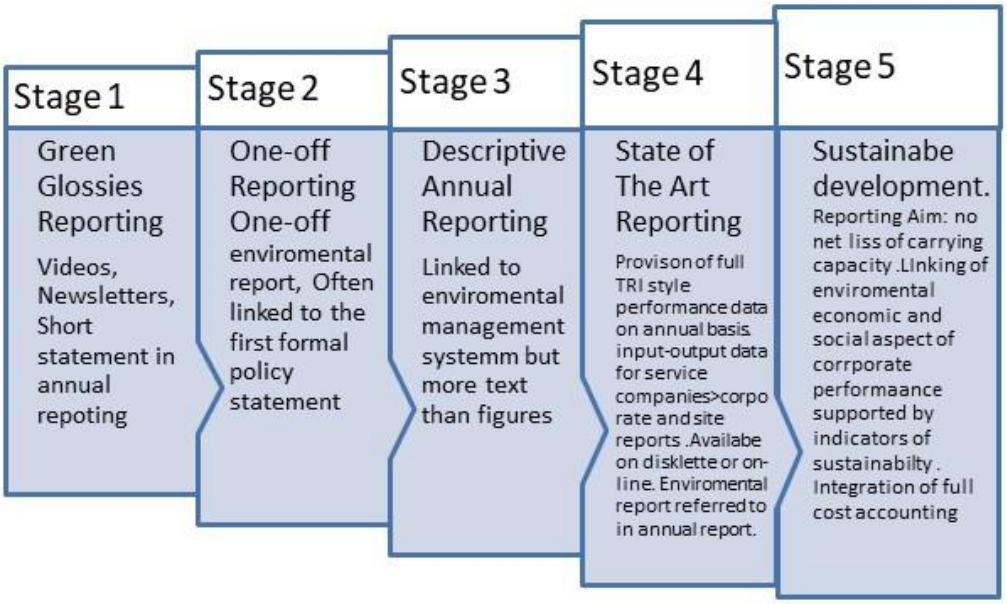

Figure 5 Development of Environmental and Sustainability reporting (Martin Bennett, 1999)

Stage one: in this stage organizations and companies used to produce and issue brochures, newsletters, and magazines, mostly with an ecological background.

Stage two: by the time the traditional reporting practices were improved therefor organizations and companies were publishing more significant environmental and sustainability reports as a One-Off-Projects which focuses on environmental principles and policies. Nonetheless, this stage had no regular timeline.

Stage three: organizations and company were preparing and issuing environmental reports on an annual basis. The reports used to be descriptive in their nature and cover a large amount of test but a few graphical explanations and measurable indicators. Although later on, organizations and companies started to include more detailed information on their overall environmental activates and performance. One step beyond, companies are providing environmental reports with more detailed information on their overall environmental activities and performance.

Stage four: in the fourth stage organizations and companies started to publish their reports as a hard copy along with an available electronic version which can be acceded online.

Stage five: organizations and company are able to disclose and issue reports based on a balanced approach. These reports demonstrate how the environmental and sustainability issues are linked with economic and social issues.

5.1 Web-based sustainability reporting platforms

Recent studies have suggested that Web-based sustainability reporting is now entering a new phase of reporting. Thus, internet-based sustainability reporting continues to develop. The 2001 benchmark survey of the state of Global Environmental and Social Reporting carried out by the CSR network (Mark Line, Volume 9, Issue 1, February 2002) internet-based reporting and more balanced reporting approach is considered to be the top reporting priorities since it offers a variety of added value offered by the ICT architecture which gives access to many features that were not feasible in the early environmental reporting stages. The transformation into web-based serves mostly taking the form of a software tool which helps in providing a set of related content (environmental, economic, social issues and mutual interrelations) that can encompass the vital features of corporate sustainability. Although, the advantages that web-based application offer don't hinder the standard features that previous staged used to offer such as hard copy reports or distributing the reports on digital medias other than the internet.

Securing all these features while allowing the report's creators to present their contents in some various presentation styles are provided depending on the targeted group. This software tools offer single source multiple media and multiple requirement sustainability reporting. Using such a software tool elevates companies to a position to move away from early environmental reporting stages towards the sophisticated one of sustainability (Mark Line, Volume 9, Issue 1, February 2002).

5.2 Advantages and challenges

With all the advantaging that the ICT architecture bring along to help the sustainability management progress also comes the same traditional challenges. As the technologies are always evolving the regulations and restriction that government issues are also making it hard for the companies and organization to follow all of them in full extent. As it is cost intensive for companies and organizations to issue a number of reports and chose the relevant restrictions to follow becomes a process of major relevance. Still, sustainability reporting has become a part of companies and organizations cultures, especially global players and sector pioneers with strict environmentally sensitive industries.

These companies and organizations have been paying additional care to different reporting formats, presentation styles and availability on various media. Currently, the internet is already used by many companies and organizations as the key interface to present or access information on environmental performance and other related sustainability issues. Further, greater internet use is promoted through a variety of ICT-specific challenges that are facing companies in addition to general reporting requirements (Ralf Isenmann, Christian Lenz, 2002)

Companies and organizations are being encouraged to use all electronic methods for distributing environmental statements, mainly through the internet, which is also considered to be the preferred method for companies and organizations to reports on their non-financial activities (Wenk, 2001) based on that, electronics forms of publication like internet and other digital medias has been considered to be essentially relevant to sustainability reporting.

Digital media distribution offers a tremendous advantage to stakeholders to be able to communicate with each other which something that printed media cannot deliver as efficiently. These ICT architecture's advantages are encouraging companies to take more steps towards a greater use of software and digital tools to meet the ever-increased reporting requirements in some more productive manners. Still, the current practices show that there is a plenty of rooms for software providers to improve their software and digital tools to support online reporting more efficiently. For instance, many companies and organizations are still using the internet as just another channel for dissemination and more as an interface to communicate with the publics and granting them access (Lober, 1997). Also, many published reports on the internet still rely deeply on printed media and only providing some electronic duplicates of their hard copies (Elkington J., Priddey C., 1997). Some companies "seem to have got stuck in the rut of thinking in terms of the printed page." In some cases, one can see this print fixation in the note "printed on recycled paper," e.g., in the 1999 sustainability report of Dresdner Bank (2000) (Elkington J., Priddey C., 1997). These practices led some companies to prepare their sustainability reports as printed materials and then transfer them to the internet without providing much of added value Such an Orthodox practice is confirmed through empirical findings (Ralf Isenmann, Christian Lenz, 2002). A study measuring sustainability reporting on the internet by the Global Fortune 500 found that companies are likely aware of the Internet-specific benefits, but most reporters do not exploit the full potential by far that this computer-based medium could actually offer for interactive reporting (Pall Rikhardsson, Anders Jacob Raj Andersen, Heine Bang, 2002) The Same conclusion was also found by Jane Andrew, University of Wollongong (Andrew, 2004) found in a study surveying 64 Australian stock-listed companies from 2001-2002 that the type of environmental disclosure does not vary significantly from that of hard copies, and that computer-based-media is still far from being utilized to its full potential.

Nowadays, the traditional methods of non-financial reporting seem to be outdated and not sufficient enough if the reporters would only utilize the internet to only upload their hard copies versions without any added values. As a result, an increased number of government organizations and regulators are no longer satisfied with the reports that are only provided as a hard copy or some electronic duplicates of its contents. Professional finance community such as financial consultant, investment analyst, banker and insurance companies request some more calibrated reports and prepare it to be available online and ready for machine processing without the need of capturing the same date in an electronic form again.

In total, among the difficulties reporters and report users are struggling at present, there are three crucial trends facing companies at present and in the near future (Isenmann, 2004) flexible integration of environmental, economic, and social issues into reports, provision of reports on various media, and fine-tuning reports according to users' preferences and fulfilling the needs of guidelines and other recommendations.

5.3 GRI Certified Software and Tools Program

The Global Reporting Initiative offers an official certification to Software and Tools that help companies and organizations through the process of collecting the data and preparing the content of their reports. These programs help the organizations and companies to make sure that their collected data is accurate and in harmony with the GRI guidelines and negates a lot of human's errors that might occur during the reporting process.

Subsequently to the fact that Global Reporting Initiative owns the copyright of all GRI content. All types of software and tools require a GRI certification and written permission in case of using the GRI copyright contents (data gathering systems, reporting process reports, learning software, etc.) A software or tool may be a stand-alone product included in a broader suite. Like for example including other standards from different organizations. This certification is crucial for any company that is willing develop, planning to develop or already have developed a tool or software that includes GRI content in it. Whether it's profit or not-for-profit organizations. Still, a certification is not needed in case the organization is planning to create its own digital GRI report.

GRI does not recommend any providers or software or tools. GRI only verifies the correct usage of the GRI content in the software or tool in question but does not take responsibility for the quality or use of the overall tool or software using GRI contents. The verification process might take from one month to serval months and the required period for reviewing the software or tool would be determined during the MEMORANDUM OF UNDERSTANDING (MoU) stage.

"GRI certified software and tools come with the guarantee that the relevant content from the GRI Guidelines or GRI Standards is correct, enabling robust and transparent reporting" (certified software and tools program, 2017).

The GRI has set a deadline for accepting new Certified Software and Tools applications for the G4 Guidelines on 30th of September 2016. The software and tools applications that have been already verified by the GRI committee and granted an official certification would retain their certification and be able to extend their permission for using GRI G4 guidelines contain until 30th of June 2018. After this date, the GRI Standard will be the most current and recognized version of GRI reporting.

The application for verifying and granting certification for the Software and Tools which contains the GRI standard will be following the GRI Standards launch events which took place around the world between October 2016 and June 2017 the GRI started accepting the applications for tools which contain content from the GRI Standards.

5.4 The Certification Process

The process of verifying that a certain Software or digital tools are correctly following the content of the GRI has to go through 5 steps.:

- APPLICATION.
- MEMORANDUM OF UNDERSTANDING (MoU).
- CHECK.
- PERMISSION.
- ANNUAL RENEWAL.

The company that delivers the software and tool has to make sure that their product meets the certification process requirements before they have been given the authorization to use the GRI content.

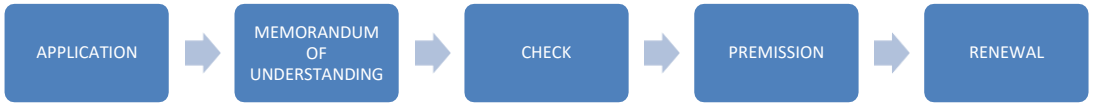

Figure 6 GRI Certification Process

1. APPLICATION

The first stage of the certification process that a software company has to do is submitting their application to the Global Reporting Initiative. In this stage, the software company has to deliver a ready draft version of the software and tool. This is done by submitting an official application form to GRI Software and Digital Tools certification process department.

2. MEMORANDUM OF UNDERSTANDING

The second stage of the certification process after when the GRI receive the Application form from of the Software/ Digital tool provider. The GRI proposes a Memorandum of Understanding (MoU). The MOU will have act as an agreement about the charges, the expiration periods, the timelines of the agreement, subject to the certification and other conditions regarding the certification.

Furthermore, the GRI will sign a Confidentiality Agreement or Non-Disclosure Agreement (NDA) If requested by the software developer to ensure that the shared information will be protected and it will not be shared by any opponents.

3. CHECK

After signing the MOU from both parties, The GRI has to review the Software or the Digital Tool that the software company had submitted. To accomplish this process, GRI has to have full accesses to the draft version to be able to complete the checking process and make sure that the submitted tool is in an accuracy of the GRI content. After completing the initial checking process, GRI will provide the software company with feedback on the necessary changes required and the modification that is needed to be made to ensure that the use of the GRI G4 Guidelines/ GRI Standards is correct and in coherence with the Guidelines. The checking process will also cover some other aspects like the completeness of the GRI content, proper division of the elements or clear distinction between GRI and other reporting frameworks.

4. PERMISSION

After completing all the required modifications to the Software or Digital Tool. The GRI will grant a certification in the form of permission letter and organizational marks. This permission can appear in the Software/Tool and also in the software company's website. All the certified software and tools are also listed on the GRI Certified Software and Tool Directory.

5. ANNUAL RENEWAL

The consent of using the GRI content in software or tool has to be renewed on an annual basis. The company that developed the software and already got the permission to use the GRI content can apply for an extension of the previously acquired permission. After applying for the renewal application, GRI will check the software/digital tool again to ensure that the use of GRI G4/Standards is still incoherence and accurately follows the software and digital tool certification. After the rechecking process, the GRI issues a permission extension letter with updated organizational marks.

5.5 Requirements for applying the GRI content:

All software or digital tool which make use of GRI copyright protected content from the GRI G4 Guidelines, need an official GRI certification and written permission to be able to use the GRI copyright content. The GRI Certified Software and Tools Program confirms that GRI content in software and digital tools is being used accurately. And All software or digital tool (data gathering systems, reporting process reports, learning software, etc.) Require a certain set of prerequisites before applying to use the GRI G4/ GRI Standards content:

1. Transparency: the use of any part from the GRI G4/ GRI Standards copyrights protected element in any Software, or Digital tool must be plainly stated that it is a copyright material and it has been authorized to be used by GRI. The GRI Certified Software and Tools programs must be applied to the following type of software and tools:

    - Sustainability reporting wizards;
    - Tools for assessing performance for internal management systems;
    - Tools and software for data gathering;
    - Other tools.

2. The accuracy of reproduction: The GRI content must be accurately used and completely match the original content contained within GRI G4/ GRI Standards Guidelines.
3. Completeness: when a software of a digital tool uses a GRI General or Specific Standard Disclosure. The software provider most also includes the specific part of GRI guidelines that have been used. The software provider most also includes a web link to the complete guidance of the equivalent indicator that has been used.

4. Clarity: when using a GRI Disclosures, the numbering of that specific disclosure must also be included, for example:

   Full name of the disclosure: – "G4-4" or "G4-EN14."

   The meaning of the numbering must be included in the implementational guide or in all other documents that support the use of the software. For example:

   G4-EN21: "G4" – indicates the fourth generation of the GRI Guidelines, "EN" – indicates the Environmental Category, and "21" – indicates the number of the Indicator in the Category.

5. Added value: GRI hold the right to grant the authorization of using its copyright contents in software and digital tools. The presence of any GRI copyright protected materials and contents is only granted when the usage of these materials adds value to the GRI guidelines which are not presented in the original materials.

6. Disclaimer: all the software or digital tools that use or include any part or parts of the GRI copyright protected contents should include the following disclaimer:

   (Software name) Has undergone certification through the GRI Certified Software and Tools Program. This means that GRI confirms that the content from the GRI G4 Guidelines is being used accurately in this software or digital tool.

   (Name of the software provider) Cannot guarantee that the use of this software or tool will result in producing a sustainability report that can be classified as a GRI G4 report. The complete GRI G4 Sustainability Reporting Guidelines have to be considered in order to ensure that the report will qualify as a GRI report.

7. Communications: Software and Digital tools that use GRI contents must deliver every messaging and communication material to GRI in the case of these materials contain direct or indirect references to the GRI copyright materials. These materials include user guides, marketing material, and website tests. This step is required to ensure that the referencing to the GRI is accurate and it helps the Software and Tools Program provider be assessed in approving the contents.

For GRI Certified Software and Tools Program Pricing Policy, please see appendix A

For a List of Certified Software and Tools by GRI Directory, please see appendix B

6 Framework for ranking Sustainability Reporting Software

While the Global Reporting Initiative does have a certain set of requirements that a software or a digital tool's providers have to satisfy in order to be granted an official certification to use the GRI contents. Still, these requirements only ensure that the software or the digital tool is in harmony with the GRI copyrights content, but it does not put any conditions or restriction on the way the software itself operates. Since this might be considered as better way to grant the software provides a high level of flexibility when developing their software or digital tool and also give the final user of the product a different options to choose from according to what they prefer and what suits their business best, it can also be a critical point for these software providers since their final product might actually get certified by the GRI and still lack some essential requirements which might hinder the software or a digital tool from serving the final user needs in a sufficient and effective way. Here is a list of suggested features that a certified software or a digital tool should also have in addition to the GRI software or a digital tool requirement, to ensure that software or a digital tool will serve the end user properly in real life scenarios.

Regular customers usually have a flexible, still, limited knowledge when it comes to choosing a new software to be used for their corporation when it comes to COTS-based architecture customers ask for Basic system function which connects data providers with data that they have. This process is usually presumed to be achieved independently from any Hardware upgrades that might be required, but with the rapid advancement of technologies, a new set of criteria has been established and the customers can't ignore the fact that they might need to upgrade the current middleware technology.

Different mythologies have been created to help the customer to choose the best available product that satisfies their requirements.

6.1 The importance of COTS evaluation process

Evaluation a certain type of product usually depends on the evaluator understanding of the product and the needed functionality, companies usually apply a Commercial off-the-shelf (COTS) evaluation in different ways depending on who is doing the evaluation and ultimately who would be making the decision. For instance, if the evaluation is being done by the accountant department of a company it would most likely consider the cost as the most crucial aspect of the evaluation, similarly if the evaluation is carried out by the IT department, then the consideration would be more focused on the system architecture and the design of the software.

Some organization choose to handle the evaluation process by their parent organizations and determine which product to endorse for their subsidiaries, another evaluation is done for the sake of evaluation the offered products. This section focuses on choosing the best sustainability reporting system that can meet the majorities of the known requirements for small and medium enterprises.

The first step to determine if a certain sustainability reporting system is able to achieve the level of satisfaction that a certain organization needs would be asking the following questions:

- Does the product offer all the essential functionality that the organizations requirements?
- Does the product able to satisfy future needs
- Is it flexible enough to be customized for the organization special requirements?
- Is the product suitable for the organization business strategies?

Setting up evaluation criteria is a complicated process and determining the stability is very related to more than just meeting the essential and basic technical requirements. Normally, the actual end users ask for more functionalities than what is actually required, while software developers and engineers often try to find a simplified solution for the required task.

While the end users typically want as much capability as they can get, software designers and engineers often prefer a simpler solution. The solution to this dilemma can be found by applying a concrete evaluation which helps to solve these contradictory interests while concurrently achieve a more comprehensive system understanding.

The evaluations process of sustainability reporting software is also consistently challenged by how quickly the sustainability products change and by how often a new requirement from the regulator is being issued.

6.2 Traditional method of choosing a sustainability reporting software

The usual method that a company follows when deciding to invest in sustainability reporting software is typical as followed:

- Defining the organization core requirement from the sustainability reporting software.
- Defining the architecture and the design that satisfy these requirements.
- Exploring the market to find best-suited product for the previously defined requirements
- Filtering out the products which don't fit the requirements

When following the PECA process, it’s mandatory to always make sure that there a constant exploration of requirements, end users functionality, potential architecture, and designs, regulations and cost while consistently checking for available sustainability reporting system which is available during the evaluation.

The PECA process requires careful answers about the Opportunity cost. Since it can permanently affect the whole process.

6.3 PECA Process

PECA process is an evaluation process defined by the Software Engineering Institute (SEI) and National Research Council Canada (NRC), called PECA (Plan, Establish, Collect, Analyze) this process helps organizations in making good choices and comprehensive products and software decisions. It is mostly used for commercially available off-the-shelf (COTS) which is also can be applied to the sustainability software and digital tools since they are software provided by a third-party other than the GRI organization and the end users. Although some software providers offer some level of customization, still, software is not completely tailored according to each customer.

We also took into considerations that all the officially certified software and tool providers offer their services as Software as a Service (SaaS). Which provide the consumer with the needed applications by running it on a cloud infrastructure. The software or digital tool are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface (Peter Mell, Timothy Grance, National Institute of Standards and Technology, 2011).

This PECA process can be customized by the organization to select what is suitable for its precise needs which it maintains its flexibility to be used by different organizations which have different requirements and objectives. While the PECA process was inspired by part of ISO 14598 [ISO 99], still, it was comprehensive and flexible enough to be adapted to the different needs of software and predicts evaluation.

The PECS process started by an initial planning arranges the recommendation to the decision maker. Although the final selection is not considered to be a part of the evaluation process, the main goal of the process is to deliver all the needed information for the decision maker to choose from.

6.3.1 PECA process stages

PECA process got its name from the main activities that make up the process:

- Planning the evaluation
- Establishing the criteria
- Collecting the data
- Analyzing the data

Those steps are described as the following:

Plan: the planning process takes the role of evaluating the technology that derives from the project management planning process and it sets the foundation for a successful evaluation.

Establish: during the establishing process, the clear definition of the performance criteria take place and then selecting the measurement methods that are going to be used throughout the evaluation for each objective.

Collect: in this step, the evaluation should be performed by researching and experimenting the measurement and documentation technology compared to evaluation criteria.

Analyze: during the analyzing process Finding and recommending in addition to adjusting the evaluation criteria and techniques is performed and then documenting the result as part of an evaluation process. As illustrated in the following figure:

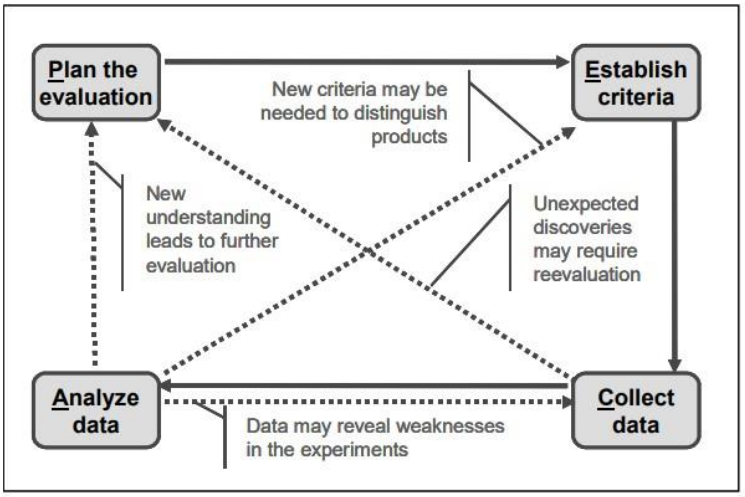

Figure 7 PECA Process (Comella-Dorda, et al., 2004)

These elements can be executed in any given order, since the evaluation events like the need for defining some new criteria or an unexpected finding that cause a new iteration, or might be caused by insufficiency of the gathered data. Any of these reasons will define the flow that the whole process will take. The PECA process delivers a sufficient amount of flexibility to put up with these changes.

6.3.2 PECA process Evaluation output

Generally, the depth of the software evaluation process can vary depending on the goal of the evaluation. When choosing a sustainability reporting platform, we must consider the fact that the chosen product might be used for several years. In the contrary, the main output of the PECA process for sustainability reporting platform is a combination of product profiles and specification and their relation to the organization who is doing the evaluation process. The output should also contain a summary and a list of endorsements.

6.4 Criteria for choosing a Sustainability Reporting Software and tools

Many companies don't plan the allocation of the resources when choosing a sustainability management reporting system. The process is usually done by different employees from different department to set up evaluation criteria and study the market to find the best-offered solution. However, this approach might not result in the best outcomes due to the lack of knowledge in regards to what features the end users would actually have must be considered for such changes. Also, the limited resources of small organizations which are obligated to submit their sustainability reports might cause rushed decisions resulting in an overlooking for some of the most important features that the company would need when starting using the software or digital tool.

Although the Global Reporting Initiative organization offers a directory of the Certified Software and Tools, still, this directory contains the software and tools which are have been verified by the GRI's Certified Software and Tools Program, this program as mentioned before only concerns about making sure that the software or digital tools have been checked and confirmed that the use of G4/GRI Standards is accurate, which is a necessary step to authorize the use of the GRI content.

This chapter offers some recommends a number of criteria for the organizations which are willing to select a sustainability management reporting software and digital tools. The criteria provide a framework of requirements for good sustainability management reporting

software and digital tools, the description of the criteria is used to show analogies to the criteria and their application and the reason for choosing them. Each criterion is described in detail. Therefore, there will include a number of equation for calculating their goal outcomes

6.4.1 Quality of Service

With the continued increase of Sustainability software and digital tools. The requirement for the ease of access to these software also increases to achieve good performance. Therefore, a sustainability software provider should ensure seamless access to their services over the internet. Thus these software providers need to offer a large bandwidth and network performance. Network performance is an essential element that concerns the users and software providers alike. The quality of Service means the ability of networks to attain maximum bandwidth and handle other network elements like latency, error rate and uptime Quality of Service include the management of other networks resource by allocating priorities to a specific type of data (audio, video, and file). (Hashem H. Ramadan, 2017)

here are three fundamental components for basic QoS implementation:

1. Identification and marking techniques for coordinating QoS from end to end between network elements
2. QoS within a single network element
3. QoS policy, management, and accounting functions to control and administer end-to-end traffic across a network (Garga, Versteeg, & Buyya, 2013)

Sustainability Software providers must ensure that accessing their platform through the internet is reliable and that the user will not have any downtime due to inadequate quality of serves.

6.4.2 Usability

The ease of using and dealing with the sustainability software or digital tool is measured by the attributes of its usability. The components such as learnability, Efficiency, Memorability, Errors Satisfaction these attributes can be quantified as the average time experienced by the users of the service to operate, learn, install and understand it respectively the word "usability" also refers to methods for improving ease-of-use during the design process.

The initial usability component can be described as the following:

- Learnability: How easy is it for software stakeholder to complete rudimentary tasks the first time they deal with the design?
- Efficiency: this component can be tester after when the stakeholder has learned to deal with the software design, and it measured by how quickly can they complete a certain task.
- Memorability: refers to the ability of the user to complete a certain task with proficiency after they have stopped using the software for a certain period.
- Errors: the number of errors that the stakeholders make, and how severe are these errors, and how easily does the software allow the stakeholder to correct/recover these errors.
- Satisfaction: refer to the level of pleasure the stakeholder has with the software design.

Another related component to measure the quality of the software is the utility which refers to the software design's functionality and if it Does what the stakeholder need.

Hence, Usability and Utility are correspondingly significant, and both control the likelihood of software to be useful since the software needs to perform the required task and also make sure that stakeholder can easily perform the task,

To study a design's utility, you can use the same user research methods that improve usability.

Utility = whether it provides the features you need.

Usability = how easy & pleasant these features are to use.

Useful = usability + utility

6.4.3 Scalability

Scalability plays a big role in the evaluation process as it determines if the software or digital tool can handle a large number of application request at the same time by different stakeholders. Sustainability software are often used by multiple stakeholders since the final report is consist of many different dates which is continuously being collected and then entered into the software in order to do a cumulative calculation to the gathered data before generating the final reports. Thus, the ability to scale the resources is crucial for sustainability software and digital tool. Nevertheless, this criterion is not related to the performance perspective of the stakeholder point of view.

Scalability is considered to have two different dimensions: horizontal scalability (also identified by a scale out) and vertical scalability (scale up). The horizontal scalability refers to the increasing resources of the same kind such as establishing more virtual machines of the same type during peak load. The vertical scalability is defined as the ability to increase the capacity of a service such as a virtual machine by increasing resources such as the physical memory, CPU speed, or network bandwidth (Garga, Versteeg, & Buyya, 2013) Vertical scalability is a significant criterion for the stakeholders of any organizations who want use a sustainability software which are mostly being offered as a could serve. If the Cloud does not permit a good level of vertical scalability, it could lead in to increase the cost of using the service, mostly at peak times.

6.4.4 Agility

For the reason that all of the certified GRI software and digital tool are web-based services. The chance for the company or organization to take advantage of the added value which these software and digital tools can offer through its agility, as it makes it easier for the organization to expand and change their operations on the software and tool quickly without having to allocate huge amount of spending to expand the scope of feature that the final report would cover. Agility according to Service Measurement Index (SMI) is measured as a rate of change metric, showing how quickly new capabilities are integrated into IT as needed by the business (Geetha, Kanagamathanmohan, & K, 2014). When an organization or a company want to choose a certain suitability tool according to its agility, the organization wants to understand whether the service is elastic, portable, adaptable, and flexible.

When considering a Cloud service’s agility, organizations want to understand whether the service is elastic, portable, adaptable, and flexible.

6.4.5 Cost (Payment Model)

The cost of the sustainability reporting was always an issue for medium and small company which hindered the development of the field for a long time, thus the cost of the sustainability reporting software or tool is considered to be one of the first inquiry that a new customer asks about when deciding to hire a web-based sustainability reporting tool. Therefore, the cost of the software is an essential point to drive into sustainable reporting. Although cost is considered to be subjective to the organization that is willing to start their sustainability reporting practices and the kind of business they do or offer.

The cost of a sustainability software or digital tool depends on two main chrematistics: the amount of money the organization or the company has to pay to purchase the service from a certain provider and the ongoing cost of running the service, which also includes the hired staff cost. It is not usually considered an easy to task to compare between two different services since different providers provide different features and usually have a different pricing model. In some cases, even the same sustainability software providers offer a different set of features as one package and ask a different price for a higher tier of software feature (more users, more KPI, user-defined KPI, etc.)

Organization or a company that is willing to hire a certain sustainability reporting software or digital tool needs to invest in new hardware and staff which also increase the final cost of the service. Therefore, the overall ongoing cost can be considered as the amount of the money that the company or organization paid to acquire the service, the special features that the organization needs to its business requirements. The hardware that needs to be purchased, the wages of the staff that will be working on the software or digital tool and the annual cost of using the service.

6.4.6 Adaptability

Adaptability is defined by the ability of the EMS service provider to adjust changes in services based on customers' requests. It is defined as the time taken to adapt to changes or to upgrade the service to a higher level.

6.4.7 Elasticity

Elasticity for Sustainability reporting software can be determined by how much the service can be scaled during peak times. This is defined by two different characteristics: the time needed to enlarge or contract the service capacity, and maximum capacity of service. While the capacity represents the maximum number of computing units that can be provided at peak times.

6.4.8 Service response time

The effectiveness of a cloud service readiness can be calculated in terms of the service response time, in other words, how much time does the service take to be ready and available for usage. For instance, when the user makes a request to a certain function from the Cloud provider, the service response time will represent the time it takes the Cloud provider to deliver this requested service.

The service response time relies on many aspects, for instance, the average response time, maximum response time promised by the service provider, and the percentage of time this response time level is missed.

• Average Response Time is given by

$$\sum_{i} Ti/n$$

In this equation, Ti represents the time taken between the moment a user (i) requested a service from an IaaS and the moment when the request becomes available. (n) Represent the total number of IaaS service requests.

•Maximum Response Time: is the maximum assumed response time suggested by the Cloud provider for the service.

•Response Time Failure: is the time is given by the percentage of events when the response time was higher than the assumed maximum response time.

This can be calculated by 100(n′/n)

$$100(n'/n)$$

where n′ represent the number of cases when the service provider was not able to fulfill their promise. . (Saurabh Kumar Garg, Steve Versteeg, & Rajkumar Buyya a, 1012-1023)

6.4.9 Suitability

Suitability is the degree to which a sustainability service provider meets a user's needs.

Typically, there are two different cases describe accuracy. The first one is when after doing research for the available sustainability providers and filtering the one that suits the users' business requirement, and there was more than one provider which completely satisfies all the core needs and some of the non-essential requirement. This results that all the providers are suitable. The other case would be when the filtering process results in an empty list of service providers which satisfy all the essential features that the business needs. In this scenario, the chosen service provider would be the one that will deliver the highest degree of satisfaction for the essential requirements

$$Accuracy = \frac{number\ of\ non-essential\ features\ provided\ by\ service}{number\ of\ non-essential\ features\ required\ by\ the\ customer}$$

if only essential requirements are satisfied

= 1 if all features are satisfied.

= 0 when not all the needed features are satisfied. (Saurabh Kumar Garg, Steve Versteeg, & Rajkumar Buyya a, 1012-1023)

6.4.10 Reliability

Reliability in Sustainability Reporting Software represents the level of how the service provider operates without failure during a given time and condition. Consequently, it is determined mostly based on the amount of time that the service provider promised not to have failed, this can be determined based on the previous failures experienced by the users and other reports and reviews

Reliability can be calculated by the following equation:

$$Reliability = probabilirt\ of\ faliur * Pmttf = 1 - \left(\frac{numfailure}{n}\right) * Pmttf$$

(numfailure) represents the number of the current users who have previously experienced a failure in a time interval less than promised by the Cloud provider,

(n) represents the number of users,

(Pmttf) represents the promised mean time to failure.

For example, Reliability of storage device can be defined in terms of durability, that is the chance of failure of a storage device. . (Saurabh Kumar Garg, Steve Versteeg, & Rajkumar Buyya a, 1012-1023)

6.4.11 Throughput and efficiency

Throughput and efficiency are important measures to evaluate the performance of infrastructure of the services provided by an Environmental Management System through the Clouds. Throughput represents the number of tasks completed by the service per the unit of time. It worth clarifying that it is a different concept from the Service Response Time metric, which calculates the speed of the provided service.

The total throughput of a Cloud service is given by:

$$\alpha = \frac{n}{Te(n,m) + T0}$$

This equation includes the deferent factors that affect the execution of a certain task. For instance, assume that we have a user that is using an EMS and have an ‘n’ number of task to be performed. Let’s also assume that these tasks are being sent to an ‘m’ number of machines provided by the EMS provider. Te (n, m) represents the execution time of n tasks on m machines.

Te (n, m) is the time overhead due to various factors such as infrastructure initiation delays and inter-task communication delays. (Saurabh Kumar Garg, Steve Versteeg, & Rajkumar Buyya a, 1012-1023)

The Cloud system efficiency specifies the effective utilization of leased services. Consequently, a higher value for efficiency indicates that the overhead will be smaller.

System efficiency can be given by:

$$\text{efficiency} = \frac{\text{Te(n, m)}}{\text{Te(n, m)} + \text{T0}}$$

6.4.12 Internationalization and localization

A Multi language support might be a key feature for a company that is looking for a Sustainability Reporting Software since it might operate their business in multiple countries and the chosen software should be ready to support international markets

The localization should not only cover the interface but also should offer a sufficient support concerning the online help, tutorials, sample programs and printed documentation.

7 Conclusion

7.1 Final word

Environmental Management Systems and their reporting tools offer a chance for organizations to achieve a steady benchmarking for the inside corporate ecological impact. The existing Environmental Management Systems frameworks permit the establishing of shared features at facilities worldwide, regardless of the kind of operations and the regulatory requirements. Nevertheless, for a sufficient corporate benchmarking to be accomplished, some modifications to these current Environmental Management Systems frameworks is required. Initially, a shared goal is necessary for the facilities in order to deliver a common foundation for assessment, benchmarking and comparison. Furthermore, there is a need for a concert method that can be followed to collect the information that is linked to the final goals and a mechanism to report the data to a shared center within a definite period must be counted in the requirements for each facility. And lastly, management assessment must happen at a corporate level to measure the development of each facility and decide the needed actions which must be taken in the future to ensure a continues enhancements.

These modifications in the common EMS framework would help companies and organizations to identify the problem in differences that exist in environmental importance and regulations changes in different regions that the organization or the company operate in. The utilization of an Environmental Management Systems for corporate environmental evaluation needs some alternations to the EMS so it can offer a solution for managing environmental topics across the organization.

It is well noticed that there are some strong tendencies developing from the environmental reporting. This thesis can not necessarily address the sustainability reporting as a whole, but it is demonstrative of many main reports strategies

- Sustainability reporting is getting more uniformed and consistency, new reports are using more shared element and in general the whole sustainability reporting is getting more standardized
- For some enterprises reporting has taking another dimension of address the challenged that are facing out planets and its it getting more attention to how global performance rate has its impact rather than relatively small and individual responsibilities.
- The development of sustainability reporting is making huge steps in some part of the world more than other. Some governments are revoking their previous commitment which is causing some huge bad effects on the global sustainability management.
- Integrated reporting which is connected to the financial reporting still needs to demonstrate its effectiveness in more practical methods.

Sustainability reporting has gone long way in the recent years and it is generally more about the business strategies and the integrating between the already formed business practices and the plans that need to be made to help to obtain a more sustainable future. There is still a lot of work that needs to be done in many areas in the area that are directly and indirectly connected to sustainable practices as it is sometimes has as much impact as the financial information.

7.2 Limitations

Sustainability reporting has gone long way in the last 25 years and it is generally more about the business strategies and the integrating between the already formed business practices and the plans that need to be made to help to obtain a more sustainable future. There is still a lot of work that needs to be done in many areas that are directly and indirectly connected to sustainable practices as it is sometimes has as much impact as the financial information. The research mainly focuses on the Global Reporting initiative since it is the dominate sustainability reporting guidelines provider, the results could be more enhanced if sustainability reporting guidelines were examined more deeply.

7.3 Future Work

since the study is an extensive initial step in examining the sustainability reporting practices and its relation with ICT, there is a great possibility to expand on this research. It would be interesting to explore a deeper alignment between different Sustainability reporting key provider (e.g. GRI with another Sustainability Reporting Guidelines provider) and Exploring the ICT based tools which offer some improvements to the internal data collection process which sequentially would improve the quality of the final reports and provide a better understanding and managing of sustainability topics. Exploring these topics as future study can help in a better result and achieving in this area.

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Declaration of Authorship

I hereby declare that I am the sole author of this thesis and used nothing but the specified resources and means.

Magdeburg, 7.12.17

Najdat AlSoufi

Appendix A

GRI Certified Software and Tools Program

Pricing Policy

GRI Certified Software and Tools Program

Pricing Policy

This policy applies to third parties using GRI Copyright Protected Content in software and tools developed for COMMERCIAL purposes. It covers both certification and copyright fees.

GRI certification is free of charge for software and tools that are to be distributed free of charge.

Article 1 *Definitions*

"Certification Process Fee"	Covers the costs of certifying the software or tool. The calculation of this fee is explained in Article 3 of this document.
"Initial Copyright Permission Fee"	Is due after the certification process has been successfully completed, for the purpose of permitting the usage of GRI certified content in the software or tool for a period of twelve (12) months. This fee equals to 50% of the "Certification Process Fee".
"Renewal Copyright Permission Fee"	A recurrent fee that is charged if no modifications of the certified GRIcontent have occurred in the software or tool, and if the Client chooses to prolong the permission to use GRI certified content for an additional period of twelve (12) months. The level of fee is the same as the "Initial Copyright Permission Fee".
"Corporate" (Type of Organization)	Companies that have an annual turnover of 10 million Euro or more.
"SME" (Type of Organization)	Companies that have an annual turnover of less than 10 million Euro.
"Not-for-profit" (Type of Organization)	Organizations that do not distribute their surplus funds to owners or shareholders now and/or in future, but instead use them to help pursue their goals.

Article 2

Factors that determine the price

The price calculation is determined by the following factors:

1. The extent to which GRI copyright protected content is applied. The more GRI content that is included, the higher the fee will be. For details, see Article 3 below.
2. Type of organization. SMEs are charged less than corporate.
3. Members of the GRI GOLD Community that are active at the time of payment receive a 10% discount on the payable fee.

Companies planning to develop their software/tools as non-commercial products for distribution as a free public good are requested to contact GRI: CertifiedSoftware@globalreporting.org.

Article 3 – *Fees*

Certification of initial language version

	Price Category		Corporate Price (Euro)	SME Price (Euro)	Not-for-profit Price (Euro)
Certification Process Fee	*PART 1* *Certification administration fee **		*€ 15,000*	*€ 5,000*	*€ 2,500*
	PART 2 *GRI Standards Content or Sector Guidance: ***				
	GRI Universal Standards 100		*€ 5,000*	*€ 5,000*	*€ 5,000*
	GRI Topic-specific Standards (200, 300, 400), incl. GRI:103	*Up to 10 Standards*	*€ 5,000*	*€ 5,000*	*€ 5,000*
		Up to 20 Standards	*€ 7,500*	*€ 7,500*	*€ 7,500*
		More than 20 Standards	*€ 10,000*	*€ 10,000*	*€ 10,000*
	*Sector Guidance ****		*€ 5,000*	*€ 5,000*	*€ 5,000*
	Certification Process Fee		*PART 1 + PART 2*	*PART 1 + PART 2*	*PART 1 + PART 2*
	Initial Copyright Permission Fee		*50% of above Certification Process Fee*	*50% of above Certification Process Fee*	*50% of above Certification Process Fee*
	Renewal Copyright Permission Fee		*Same as Initial Copyright Permission Fee*	*Same as Initial Copyright Permission Fee*	*Same as Initial Copyright Permission Fee*
** Applicable in all cases*					
*** Applicable depending on the Standards of the GRI that are used*					
**** to be developed for GRI Standards, to be used in combination with elements listed above*					

All fees are exclusive of VAT

Certification of additional language versions

Once the Standards will be translated into additional languages, it will then be possible to certify tools based on the GRI Standards in additional language versions.

Each language version of the GRI Standards content will be certified separately. The price calculation for the first language version is described in the general scheme above. It serves as the base for calculating fees for the additional languages where a proportion of the original Certification Fee determines the "*Additional Language Certification Process Fee*".

Type of Language	Number of additional language versions	Additional Language Certification Process Fee (calculated as % from the original certification process fee)
Occidental	*1st and 2nd*	*30% of the Certification Process Fee*
	3rd and 4th	*25% of the Certification Process Fee*
	5th and any additional	*20% of the Certification Process Fee*
Oriental		
	1st and 2nd	*36% of the Certification Process Fee*
	3rd and 4th	*30% of the Certification Process Fee*
	5th and any additional	*24% of the Certification Process Fee*
Initial Copyright Permission fee		*50% of Additional Language Certification Process Fee*
Renewal Copyright Permission fee		*50% of Additional Language Certification Process Fee*

Appendix B

GRI's Certified Software and Tools Directory

GRI CERTIFIED SOFTWARE AND TOOLS DIRECTORY
UPDATED ON 25.08.2017

Organization	Software or Tools	Certified From	Certified Until	Guidelines Version	Language
thinkstep	SoFi Software	1.10.2013	11.05.2018	G4	English
OneReport Inc.	OneReport®	21.10.2013	30.06.2018	G4	English
UL EHS Sustainability	CR360 Sustainability Software	5.11.2013	26.06.2018	G4	English
Greenstone+ Ltd.	Greenstone	16.12.2013	30.06.2018	G4	English
Enablon	Enablon Sustainability Management Platform	3.02.2014	27.01.2018	G4	English
Dr. René Gastl	GRI-Worksheet	28.02.2014	30.06.2018	G4	English
CSR Nordic ApS	CSR-System	12.03.2014	10.04.2018	G4	English
Tofuture Oy	CSM (Corporate Sustainability Management)	10.06.2014	31.03.2018	G4	English
ProcessMAP	Environmental, Health, Safety and Sustainability (EHS&S) Solution	17.11.2017	30.06.2018	G4	English
CloudApps Ltd	CloudApps Sustainability Cloud	14.12.2015	31.12.2017	G4	English
Junta de Extremadura	ORSE tool	25.04.2016	24.12.2018	G4	Spanish

Total Eco Management UK Ltd.	Sustainability Reporting Tool (SRT)	31.08.2016	30.06.2018	G4	English
Schneider Electric	Resource Advisor	12.09.2016	30.06.2018	G4	English
Worldfavor AB	Worldfavor	20.01.2017	19.01.2018	G4	English
Guard Global Ltd.	GRI Structured Data Tool	20.01.2017	19.01.2018	G4	English
Greenstone+ Ltd	Greenstone Enterprise	16.12.2017	15.12.2018	GRI Standards	English
Worldfavor AB	Worldfavor	11.05.2017	10.05.2018	GRI Standards	English
360report GmbH	360report	23.05.2017	22.05.2018	G4	German
WeSustain GmbH	WeSustain ESM	28.06.2017	30.06.2018	G4	English German
OneReport Inc.	OneReport®	16.10.2017	30.06.2018	GRI Standards	English
Tofuture Oy	CSM (Corporate Sustainability Management)	18.10.2017	31.03.2018	GRI Standards	English
thinkstep	SoFi ts	27.10.2017	11.05.2018	GRI Standards	English

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