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ВИКОРИСТАННЯ ПРОЕКТІВ ДЛЯ ГЕНЕРУВАННЯ ЗМІН В ОРГАНІЗАЦІЯХ

Ця стаття є частиною досліджень, що проводяться з метою доведення ролі лідерів у створенні зміни в організаціях і спостереженні за дотриманням методів і прийомів, знаючи, що проекти і їх управління є інструментами для реалізації зміни в організаціях. Лідери, завдяки своєму впливу, а не за допомогою сили, можуть стимулювати свою команду до розробки нових проектів, що розглянуті фахівцями і практиками, а також до реальних змін в організаціях.

Ключові слова: проект, зміна, лідер, вплив, співробітників.

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ИСПОЛЬЗОВАНИЕ ПРОЕКТОВ В ГЕНЕРИРУЮЩАЯ ИЗМЕНЕНИИ В ОРГАНИЗАЦИЯХ

Эта статья является частью исследований, проводимых с целью доведения роли лидеров в создании изменений в организациях и наблюдении за соблюдением методов и приемов, зная, что проекты и их управления являются инструментами для реализации изменений в организациях. Лидеры, благодаря своему влиянию, а не с помощью силы, могут стимулировать свою команду к разработке новых проектов, рассмотренных специалистами и практиками, а также к реальным изменениям в организациях.

Ключевые слова: проект, изменение, лидер, влияние, сотрудников.

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**INNOVATIVE ERP APPLICATIONS IN THE PUBLIC SECTOR:
A COMPARATIVE ANALYSIS OF NEW ZEALAND EXPERIENCE**

Annotation. Contemporary economic science is looking for ways of research actualisation to resolve the challenges under the world financial crisis. Besides existing challenges in private de-regulated sector, one of the efficient innovations can be found in broadening ERP applications in the Public Sector. This paper approaches to the ERP applications mainly from the economical rather than from technical perspective. Comparative analysis of New Zealand public sector is supported by relevant international practical experience (implementations), and by core fundamental analysis of economical nature of business processes used by public entities. The key advantage (based on a historical timeline) comes from a full integration of financial scope and operational activities. Using the example of ERP (as one of the drivers of productivity & performance improvement), the paper is aiming to underline how to bring the best practice and technology (data management and logical architecture) from the private sector into the public sphere.

Keywords: ERP, Public Sector, optimisation, New Zealand, productivity, financial implementation, configuration.

Introduction. ERP BASICS. In 1990 (i.e. 25 years ago) the first commercial usage of ERP (enterprise resource planning) was recorded. ERP systems are now well developed and used in hundreds of integration applications. Despite the puzzling name, the ERP system could be applied to the entities of both the public and private sectors. With that perspective, the word "Enterprise" can be extended to the broader sense of "Entity".

The approaches to the data management and respective logical and physical architecture that are used in the private sector could equally be used in the public

environment (Fig. 1). The advantage of ERP over other data storage / data management systems is based on the fact that approaches for enterprise are:

- 1) Business driven (result-oriented, rather than process-oriented).
- 2) Have a solid background and a broader audience.
- 3) Were rapidly developed in order to fit changing business requirements.
- 4) Have an impact / reaction from specific customizations, add-ons and localizations.

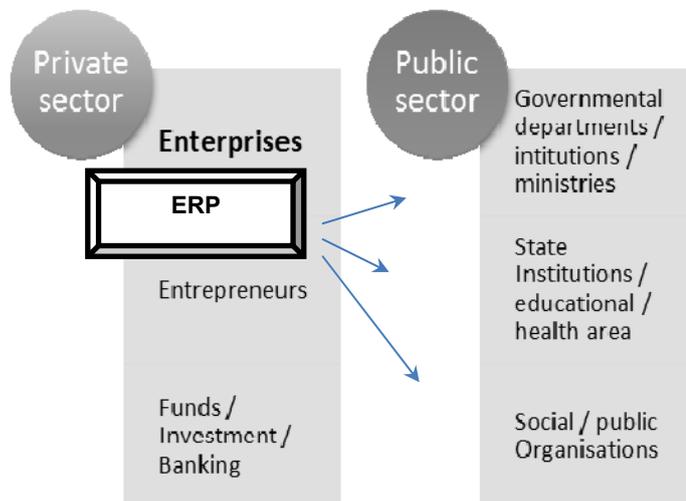


Fig. 1. Private vs. Public areas: ERP positioning

Source: own implementation research

With the existing cycles of world-wide financial crisis, it is becoming more important to focus on the public sector as it is less risky by nature, supported by national strategic initiatives and linked to its vital areas (health and education are gaining priority while commercial projects are in decline).

Since 2008, there is synergy between IT and Finance:

1) from IT: "though IT had become better aligned with the business, IT executives now had to make complex decisions based on rigorous analysis of return on investment..."

2) from finance: "today CFOs are required to develop and implement systems and processes for budgeting and performance metrics, tomorrow they'll also be required to provide the management team with real-time operational and financial data and analysis." [9]. ERP makes the operations and analysis more cost-effective and is, in itself, an anti-crisis measure. An academic approach to the dynamic ERP success modelling supports this in that there are: "...operational outcomes such as productivity improvements and improved decision making which, after all, are the reason for the investment in the new technology in the first place." [13]. For firms, productivity is a priority, while for the public sector, it is about improved decision-making and non-tangible benefits (process standardization and data visibility, enhanced regulatory compliance, institutional accountability, and reduced work load in different departments). [21].

There is a similarity in approach to the microeconomic tools and methods in the private sector which are applied on a macro-level in the public sector. The basic mathematical models and behavioural mechanisms are brought from individual practices to a group/community level. Business-process alignment and following the best practices becomes a crucial point in implementations. [24].

The top five contemporary ERP Systems [29], where solutions were designed for the private sector and later adapted to the objectives of government, are: Epicor (global presence, middle market and several strong industry solutions), Infor (American and German business philosophy, middle market leader, professional services automation, strong vertical industry solutions and manufacturing), Microsoft Dynamics (originally Danish business philosophy for Navision / NAV and Axapta products, range of potentially integrated software solutions, small business leaders, strong financials and costing modules), Oracle (American business philosophy, large scale market and strong CRM (Customer Relationship Management) with supply chain management solutions and deep functional flexibility), and SAP (German costing philosophy, large scale market leader with 22.4% market share in 2009 in business intelligence, analytics and performance management, 16.8% growth from 2009 in revenue; all-in-one enterprise solutions, deep accounting and distribution software suites along with tightly integrated financials, manufacturing, HR, payroll and CRM software systems). [18]. Today, the majority of the solutions are "on-premises" while the future market will be based on "cloud"-enabled (e.g. "Azure") vertical solutions (using software as a service).

As public sector entities are not demanding over-complicated technology, a middle range version can be chosen, provided the solution is compliant with the latest technological requirements that will be linked to other systems. Neither the range of model, nor the newest Application Platforms are crucial factors when choosing a system. However, a reliable solution based on vendor strength and large practice of implementations / broad customer base is still needed. Selection of the proper ERP also includes the availability of localisations (plus

customization capabilities) and convenience of support services (stable reseller channels – preferably local). Bureaucratic predispositions of the public sector in New Zealand are resulting in managerial bureaucracy and organisational superiority of administrative cost centres over income or profit centres. [1]. Therefore ERP and respective innovations are applied mainly to the cost-areas.

Methodology. SPECIFICS OF OPTIMISATION IN NEW ZEALAND PUBLIC SECTOR. Mathematical optimisation modelling (incl. dynamic optimisation) was mostly popular in 1980th – 90th mainly following the plan-driven economic indicators in both: socialist and post-industrial economic regimes. Now it became obvious that purification of optimisation modelling in management is insufficient. Real-life scenarios require adaptation mechanisms and flexibility in terms of resources planning, procurement and utilization.

Some of current research is still based on optimisation modelling in agriculture (please note that dairy industry is the key export line of New Zealand): "A nonlinear optimisation model of a NZ dairy farm, in which 10%-20% of feed is imported, is used to (1) access the implications of maximising Operating Profit. (2) evaluate the cost of maintaining a focus on producing high milk volumes, and (3) characterise general management practice that maximise Operating Profit". [6]. Analysis of production functions alongside the elements of costs at different rates of efficiency can be useful tool once the whole model is defined for multitude of input- and output prices, variable volumes and capacities.

New Zealand's traditional area of competition is in primarily structurally unattractive industries from the international return on investments point of view. This is where the profit potential is low (for resource based commodities, such as dairy, declining trend on export markets requires rapid business reaction, which is impossible in an inert government-administered style). There is a complexity in maintaining control over the economic environment (also under the vulnerability to exogenous shocks and natural disasters, specifically in agriculture). As indicated by G. Crocombe et al. already in 1991 (this period also coincides with the beginning of post-socialism era in Europe) "Improvements in production (measured in volume) that do not result in improvements in productivity (measured in value) do not increase national income, they merely keep it from falling". [7]. Non-optimal improvements restrain investments flow in those involved companies. Micro-economic level of planning and controlling becomes a main factor in the capital flow based on optimal enterprise resource planning and controlling applied to both: internal cost structure and elasticity to external / exogenous impact.

For New Zealand steady-state in production factors, where "agricultural productivity grew at the rate 1.4% from 1953 to 1985 and at the rate 1.8% from 1986 to 2001" [17], it is important to optimise the cost structure and attract innovations from both –international Research and Development (R&D) and domestic (where 80% of it is publicly funded). "Total R&D spending and business R&D spending in New Zealand are both below OECD averages, and by wide margins. Gross domestic expenditure on research and development (GERD) was 1.2% of GDP ... (2005), compared to an OECD average of 2.3%. New Zealand's GERD ratio has been at the low end of the ranking for some time and looks particularly deficient in relation to the United States (2.6%), as well as leading countries such as Sweden (3.7%), Finland (3.5%) and Japan (3.4%), or another small isolated country, Iceland

(2.8%)." [20]. R&D is not just an innovations in technical features of the product, it is also research in optimisation of technical processes and related cost efficiency. There could be several outcomes of supporting and subsidising innovative R&D (including enhancements in the ERP implementations) in enterprises. Ability to improve and support innovation process results in inevitable success in respect to the target of improving economic performance via economic and fiscal policy. [12].

Enterprise goals are defined by multiple factors incl. its core structure, fundamental split of ownership, internal and external motivation of Equity and Liability counterparties. Those goals also depend on the type and style of governance (subject to corporate governance regulations) and therefore are very specific for public sector. There are fewer incentive processes related to staff, while there are higher requirements regarding the social responsibilities, safety and transparency. It is acknowledged by New Zealand academic school that "New Zealand managers better trained for administration than creating new products, services and strategies". [8]. Therefore local firms traditionally follow cost-based strategies (instead of R&D, innovations) with minimal efforts at differentiation of products and services. Such differentiation would be based on optimisation models in terms of net profit function under budget and resource constraints. Analysis of the constraints correspondingly would require pro-active (instead of reactive) approach in enterprise resource planning, where ERP systems can be used not just to reflect financial and operational events in the past, but be leveraged in forecasting, cost/profit analysis and supply chain optimisation.

The main portions of core Crown expenses (in an example of 10 months ended 30 April 2015) is Social Security and Welfare (30% of total expenses), health (16%), education (15%), while Economic and industrial services account for 9%. [4].

The motivators for economic growth at micro-level are acknowledged by NZ own academic views: "New Zealand's small domestic market, high wages and distance from foreign markets shape the composition of New Zealand production. The small domestic market is ideal for small- and medium-sized enterprises without large-scale economies. New Zealand is designed for niches. ... Its firms must focus on scale or high value-added production processes and market niches in order to grow." [15]. The composition of cost elements suggests that high value-added processes require implementation of the innovative approaches and also optimisation modelling [based on cost structure optimisation and also on elasticity-driven analysis].

Ordinary theory of firm suggests company's primary aim to maximise shareholder's returns. Based on that it is normally trying to optimise its functions with mathematical precision and is reluctant to support non-monetary motivation. NZ visual innocence in business and industry organisation is maybe deceiving "... a company may behave in a socially responsible way by, for example, undertaking a public relations exercise such as sponsoring a 'Keep New Zealand Clean' activity.... The costs of these activities appear to be motivated by a desire to promote society's best interest, but are really incurred in the hope of generating benefits for the company that exceed those costs". [26]. Pretending to operate under environmental and social responsibility primary focus, such organisations are either:

Making an authentic effort to support altruistic activities [at the cost of end-payer, which is potentially aligned with approved budget-spending directions], or

Trying to hide the real inefficiency in managing resources and consumptions / running costs and lack of core business-motivational drive [hence potentially

deceiving shareholders incl. public, and sometimes puzzling themselves], or

Aiming to shift the marketing focus [introducing new campaigns as factors to bias certain demand functions – hence deceiving market segments].

In the situation a) – optimisation modelling should be targeting spending of the available budget across multiple product/services category with additional social / environmental constraints; in b) – real optimisation should be driven by public and targeting organisational structure and controlling of processes; in c) – optimisation should separate real functions and control over campaigns capitalised expense. Controlling functions can be also applied to the social sphere. [25].

In New Zealand the title position "Financial Controller" is very common in public and private sector, but overall controlling is more biased towards management accounting, taking more Accounting as reflection of events in the past instead of more Management as active support to the decision-making process. Therefore controlling with elements of optimisation modelling appears to be a rarity and it can be found at times in agriculture and other primary industries in the absence of decent manufacturing.

While the majority of medium- and large-scale enterprises use ERP software packages to support financial accounting and integrity with operational billing and inventory management, ERP behind the scenes also supports elements of optimal planning related to logistic and replenishment calculations based on lead-times and availability of raw materials required to fulfil the sales orders based on demand, as well as optimal cash-flow management based on available funds and projected liquidity gaps. Those represent linear basic modelling. In some cases enterprises use more complex calculation engines for cost calculation (such as labour costs allocation to the yield, or calculation of components for Bill-of-materials based on variable factors) which are integrated to ERP.

There are several approaches to calculate detailed figures in a budget: incremental (amending current period result by a factors / expected changes in volume, prices, efficiency, innovations, etc.), zero-based (with no initial assumptions) and targeted ("... calculate what performance is acceptable and stipulate the minimal income and the maximum cost allowable for each category. ... need to plan and commit specific cost reductions to remain within the allowed limits. The same applies in the upward direction for income targets"). [3]. These functions of Controller represent optimisation modelling. [22]. It can be used not just to define / suggest projections (in the rolling forecasts or budgets) based on models, but also to compare actual resource usage against optimal model (under specific scenarios). The following aims can be reached in each case:

For Projections – optimisation is mainly based on one sustainable model, but allows multiple variants (at the point of forecasting the future state is probable, but not defined). It effectively represents ability of controlling to impact the decisions;

For Comparison – optimisation is used as a proof (actual scenario is already known, but the deviation of the actual cost element from optimal to be calculated). It supports Control function.

New Zealand went through era of economic liberalisation since 1984 and then deregulation. "The combination of deregulation and trade liberalisation led to a wide-ranging restructuring of manufacturing sector. Firms and industries which had difficulty competing in the new environment were downsized or went out of business. ... the drive for increased efficiency in the non-market public

sector was accompanied by widespread job losses". [27]. Simple Control function (as mandatory directives, rules and regulations) from government is substituted by Controlling in the public sector which is applied to the purchase of services (from both: private microeconomic subjects and public organisations) and supply of services. Importance of controlling in the public area is recognised for all 3 elements: State-owned enterprises (e.g. New Zealand Post Limited, Trans power New Zealand Limited, etc.), Government Departments (e.g. Ministry of Justice, State Services Commission, etc.), Crown Entities (e.g. Earthquake Commission, Public Trust, etc.). Objectives are set by controlling to ensure sufficient revenue and expenses to meet the operating balance objectives. The selection of optimisation options in New Zealand is based not only on theory of free market behaviour, but also on subjective views. New Zealand cannot compete based on scale and therefore follows the exogenous shocks from international markets as one of the factors in its choice of optimal economic regulations or enterprise resource planning.

The structural shift from attempts to put a base technological industrial model into the economy based on primary industries (milk, meat) and tourism-related services happened in New Zealand in two waves – late 1960s and then mid-1970s. "This seems to have been the result of two things: the high visitor inflows that were associated with the Commonwealth games held in Christchurch, and an easing in the growth of goods' exports as the first oil shock began to affect international demand." [2]. As we can see, natural disasters – earthquakes in Christchurch

2011 and international negative shock on oil and milk in 2014 have further impact on construction industry and real estate, and on services share.

Future of the optimisation in managing Entities is relying on the success in methodological platform and tools rather than on the perspectives of idealistic optimization modelling. ERP is effectively a complex of tools with configurable parameters and suggestive mechanisms.

Results. IMPLEMENTATION SPECIFICS FOR THE PUBLIC SECTOR. The New Zealand experience is proving a successful adaptation of international implementation processes to an economy where public sector traditionally plays the leading role. The first steps in implementation would include goals and targets identification, ERP selection, project team and communication scheme selection (resourcing), risk assessment, implementation process planning (incl. configuration and development), design sessions etc. as each ERP has unique implementation principles, guidelines and approaches depending on a number of factors. Configuration activities include the user set-up (roles & permissions – i.e. defining the access to specific areas of the ERP), financial set-up (incl. Chart of Accounts, Dimensions and Posting Groups – i.e. defining General Ledger, GL) formation, and specific setup of Sub-Ledgers (Fig. 2). GL will serve as the assembly point for all aspects of information generated in the system (coming from different sub-ledgers [16]). The flow of information from the GL module to other modules is not significant (settings).

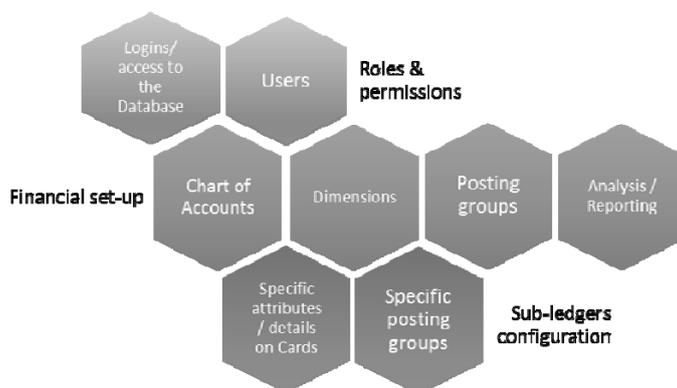


Fig. 2. Basic elements of ERP configuration for public sector

Source: own implementation research

The Users and Financial parts of the configuration are vitally needed for the System, even if some of the other sub-ledgers (such as Item Ledger [inventory handling] and Resource Ledger) are rarely used. Recently, the Job Ledger [job / task / project management] is starting to be used, though not always integrated with Sales, mainly with costs. Manufacturing and Warehousing are rarely used for organisations, as is Inventory planning and replenishment. Prior to the actual configuration activities there should be performed an assessment providing a baseline that any process can be measured against, and requirements gathering mapped to the target-operating model. There are specific techniques that help to identify configuration or business-process issues: 1) defect and incident management; 2) problem management (reactive or proactive); 3) change and configuration management; 4) testing; 5) audit [14].

Even if Responsibility Centres could be used by entities (as administrative centres, cost/profit centres), they are not linked to the multiple physical locations. Centre in this aspect will define the access to the documents handling for users. Organizations tend to have a centralized purchase/procurement & replenishment policy though not always automated. The integration with the primary – or secondary supply chain is out-of-scope. User roles and permissions are structured by the areas of application rather than by the stages of document handling. One line accountant is responsible for the expenses and FA posting, while another, for revenues and reconciliation of the Accounts Receivable, VAT/GST settlement etc. The whole financial team of a well-developed public entity is three to five persons (for small organisations it could be one or even an external super-user). The team is setting the rules / templates while detailed transactions can be handled by

operational departments, and the accounting team is focused on adjustments and reporting using the delegations.

ERP is perfect in terms of document processing as it allows transparent reflection of posted events in a real time. This happens simultaneously for all derivatives of the record across the system. No extra enquiries or data preparations are needed as they are immediately available either for reporting and analysis or for continuing the process flow.

Each transaction has a source code showing the specific process from which it was originated. Main source types are: Document, Journal and System processes. Source codes for organisations with a limited number of ERP granules, can be General Journal postings, Sales and Purchases (Documents), Purchase and Payment Journals, Entry Applications, Reversal Entries, VAT/GST settlements, FA GL Journals etc. Audit trails are supporting the navigation and transparency of data handling. When and by whom the transaction was created is handled by the Creation Date and User ID in the historical Registers (GL-, FA-, VAT Registers etc.).

Because of the limited analytics coming from sub-ledgers, the completeness of data for analysis is assured by using the extended Dimensional analytics (applied for both actual and budget data). Dimensions represent department, project, job code, cost-centre etc.

For the majority, possibly all GL accounts related to the Income Statement, it is mandatory to define the dimension value, relevant to the nature of the transaction, or the dimension value could be defaulted and limited to only one. In some cases it is reasonable to specify mandatory dimension codes for the entire table of entities (account types): GL accounts, Customers, Vendors etc. The matrix of GL Accounts and Dimensions means there are combinations analysed when one GL account total for the period could be split by figures showing different departments and, moreover, those sub-total figures could be split further by Projects. In theory this process could be extended to as many dimensions are technically available to the ERP system (for private sector it varies from 4 for Budget dimensions, to 8 actual dimensions, while for the public sector, it is 2 – 5, plus such dimensions as Time/Date and Location which are treated as extra attributes).

The public sector organizations rarely have one fixed budget for the whole year. There are sub-budgets and versions. The Sub-budgets represent budget by dimensions (expenses by departments, or for a specific project, expected revenues by a customer group etc.); i.e. a budget for the organization is consolidated from sections. Versions represent the Original Budget, Latest Estimate and Rolling Forecast; i.e. a budget is not static, but dynamic. The correct approach for ERP implementation assumes budgets across all the financial accounts, but in practice, only budgets for Expenses and, in some cases, for Revenue (funding) sections of the Income Statement, are used by the public sector organisations. Marginal analysis, profitability by product line and segmental analysis are out-of-scope. Revenues are linked to direct funding, or to projects financed from the State budget or from external sources. Hence, Intercompany accounting and Group consolidations are simplified.

Standard ERP provides out-of-the box integration between different granules located in the system and integration of external tools (Office products, CRM, SharePoint, etc.). The under-utilisation of the system could compromise the basic objectives of leveraging information for competitive advantage. Organisations are trying to establish integration between external systems (for sub-ledgers) and limited core ERP components (GL level).

The end-of-month process for public organisations is less structured than is normally needed for the real sector of economy (with cost adjustments for inventory/reconciliations between received with expected costs and invoiced quantities). In the worst case, weakness in input controls and validation checks will not ensure completeness, reliability and integrity of data. Adjustments in this limited scope are used directly at GL level. The majority of entries are generated from the Invoices (not from Purchase- and Sales Orders and Quotes) and General Journals. If users are posting the transactions directly between two GL Accounts (skipping sub-ledger records), then the data is not transparent and navigation between logically linked granules is impossible.

The myth that ERP could resolve all problems itself has a negative impact on the data verification process for the public arena. In fact, there should be two stages of verifications: prior to posting (to make sure the document or journal line contains all needed attributes / requisites incl. dimensions, dates) and after the historical transactions are created. Examples of data integrity tests include: 1) Revenue accounts compared to the customer ledger entries (aged receivables), 2) Expense accounts compared to the vendor ledger entries (detailed trial balance), 3) VAT statement coming from VAT ledger entries compared by the calculation base to the totals based on sales to customers (purchases from vendors) etc. Business Intelligence could be limited by Accounts Schedules with associated Analysis Views (data cubes), which is taken from ERP, plus Reporting Services (to be used in queries from the report server). Analysis Services requiring the advanced technique of analytical cubes configuration are not broadly used. As the payment is just the final stage of the operation, the approval process is applied to the Invoice, not to payment.

Since the accounting department is mainly involved in setting the rules / accounts up and delegates the majority of posting routines to operational departments, the main efforts will be linked to the Configuration stage. Therefore, the Accounting process will pass three stages: 1) Configuration of the system (modules) – mainly outsourced to implementers, 2) Recording the transactions (this stage is mainly delegated to operations), 3) Analysis & reporting (might include consolidation). Access to the documents or the rights to read, insert and modify the specific type of document is defined for a Group of users.

Conclusion & Discussion. IMPLEMENTATION SUCCESS. ERP implementations for Public Sector depend on the state budget limitations and therefore usually take into consideration cost-analysis instead of the investment-based view. ERP Cost factors constitute of: vendor- or supplier-related (ERP system itself as 3-tier configuration, License, Localisations / Customisations, Implementation incl. functional modules, integration, data migration, vendor project management, annual maintenance and support), hardware (server platforms, work stations, storage), software (operational systems, application server, etc.), equipment (incl. upgrading), business process re-engineering (planning, executing), change management, internal project management, HR costs (hiring, training, business engagement), quality assurance and external consulting. [10]. Controlling can provide the required support for each phase of implementations (incl. cost-analysis and optimisation of planning for the solution delivery) [23].

Based on the organisational structure and stable routine used by public sector entities, the implementation is a long process. The most complicated stages here are Analysis (Gap/Fit analysis, requirements) and Deployment (User Acceptance Testing and Training). The main issue is

the organisational readiness of a public entity to implement the new technology. As many international researchers after 2003 confirm, "The success of ERP system implementation draws more on human and business issue than technical issue. Also, the communication among managers, end-users, ERP vendors and project team members becomes more important than before." [11]. It is a difficult task because ERP is trying to change the existing usual workflow and make a natural integration of disintegrated functions. Changes in processes are provoking a defensive position in end-users.

The main issues in the implementation aspect for public organisations are: 1) Motivation of end-users (they may not be profit or result oriented), 2) Redundancy of data input (many initially unsynchronised information flows), 3) Rather complicated approval/confirmation process, 4) Asymmetries in terms of requirements to the system and processed data, 5) Prevailing social interests over business needs, 6) Limited time dedicated by key-users to the project, 7) Limited availability of internal IT specialists so external IT support required, 8) Long period of implementation etc.

However, certain aspects of ERP implementation are easier in the public arena than in private enterprises: 1) Stability of decisions (once taken, decisions are not changed on a frequent basis); 2) Unbiased view of testing results (key-users are not depending on the results, but showing the transparent process), 3) Simplified security (access, roles, permissions), 4) Flexible deadlines, 5) High knowledge retention within organisation (low staff turnover rate), 6) Good standards of documentation and keeping of historical records.

Despite the insufficient and asymmetric information, and differences in methodology [19] and statistical deviations (spread of data is increasing in time), we can observe positive signals from the public environment (when Project Management Office is in place) insuring that ERP implementations are following a predictable path/route (form a stable trend in a historical perspective (Fig. 3)). The Public sector has been actively using ERP solutions focus for only the last 5 – 8 years.

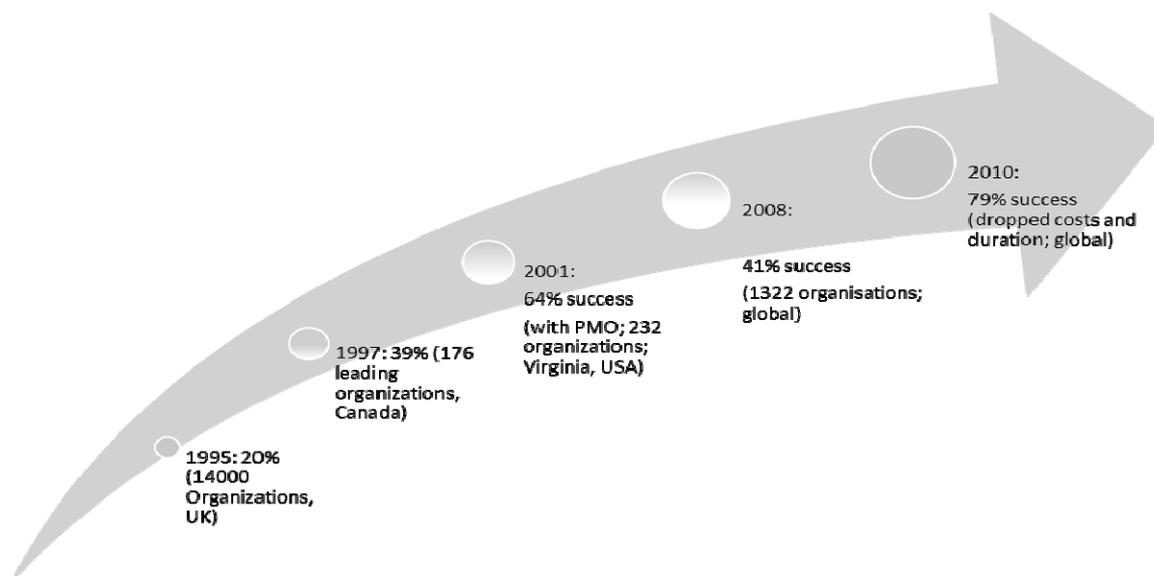


Fig. 3. Timeline of successful ERP implementations (selected surveys)

Source: 5, 19, 28, 30

The statistics shown above are based on a small pool of organizations with the main factors of time and budget. The Positive figure of 2001 is conditional [28], as well as for 2008 [5] (on costs basis) and 2010 data [30] (more than 30% anticipated business benefits). The future of ERP implementations should look even better in the Public Sector based on three major factors: 1) Current achievements in integration sphere allow seamless flow between multiple environments and solution components (therefore the limitation based on dependency on a single solution across multiple functional areas is not a constraint anymore), 2) Attempts to standardise the implementation approaches, templates, methods and technique (led by Microsoft "Sure Steps Methodology" in 2006, but actively used since 2010; Accelerated SAP implementation methodology by SAP), 3) Shift in expectations management: organizations became more realistic in their expectations and detailed in the business- and functional requirements (projects are structured by phases and supported by Project Management Office and transparent processes in public-sector organisations). The key factors of success for ERP implementations in the governmental

institutions is the reliability and convenience of the application (it should be easy to run and transparent to find specific data-sets), usability (intuitive search and navigation, visually supportive in terms of graphs and diagrams), simplicity of cross-functional integration with other systems and reliability of the solutions (trust to the implementation partner, customizations expertise, available onsite support, warranty period and user guides / manuals). These factors prevail over performance for data search, reports processing and posting.

On the one hand, the public sector of economy is more stable and sustainable in terms of operational process-flow and methodology of analysis despite the quick change of business conditions (economic cycles incl. recession stages). On the other hand, a requirement to be transparent and accountable is essential for organisations and governmental institutions. For the majority of public entities, General Ledger, sub-ledgers for Customer Ledger Entries and Vendor Ledger Entries are the main ledgers which are used. ERP system should be used as a basic platform to organise a simple workflow and record key financial information along with supplementary informational flows.

New Zealand represents a unique economic environment where the impact of the public sector is significant, but the economy is continuing its growth under the strengthening impact of globalization (this globalization has the private sector historically as its main focus). Using the example of ERP (as one of the key drivers of productivity & performance improvement in the contemporary world), it is crucial to bring the best practice and technology from the private sector into the public arena.

Conducted analysis lets us come to the following conclusions:

Economic approaches which can impact on the crisis resolution processes exist in a public sector economy under the conditions of operational and financial control improvements;

ERP applications should be looked at from the international perspective of collaboration in both Private and Public Sectors, as the combined experience in post-industrial economy brings a new wave of Innovations.

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Новозеландська Асоціація Економістів, Веллінгтон, Нова Зеландія

ІННОВАЦІЙНІ ERP ЗАСТОСУВАННЯ В ПУБЛІЧНОМУ СЕКТОРІ: ПОРІВНЯЛЬНИЙ АНАЛІЗ НОВОЗЕЛАНДСЬКОГО ДОСВІДУ

Сучасна економічна наука шукає шляхи актуалізації розробок для подолання викликів за умов світової фінансової кризи. Попри існуючі проблеми в приватному де-регульованому секторі, одна з ефективних інновацій може бути знайдена в поширенні ERP застосувань на публічний сектор. Ця стаття підходить до ERP застосувань переважно з економічної ніж з технічної перспективи. Порівняльний аналіз Новозеландського публічного сектору підтримується відповідним міжнародним практичним досвідом (впровадженнями), та основним фундаментальним аналізом економічної сутності бізнес-процесів, що застосовуються публічними суб'єктами. Ключова перевага (в історичному ракурсі) приходить від повної інтеграції фінансової сфери застосувань з операційною діяльністю. Застосовуючи приклад ERP (як одного з рушій покращення продуктивності та ефективності), ця стаття спрямована підкреслити як довести кращу практику і технології (управління даними та логічної архітектури) з приватного сектору до публічної сфери.

Ключові слова: ERP, публічний сектор, Нова Зеландія, продуктивність, фінансові впровадження, конфігурація.

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Новозеландская Ассоциация Экономистов, Веллингтон, Новая Зеландия

ИННОВАЦИОННЫЕ ERP ПРИЛОЖЕНИЯ В ПУБЛИЧНОМ СЕКТОРЕ: СРАВНИТЕЛЬНЫЙ АНАЛИЗ НОВОЗЕЛАНДСКОГО ОПЫТА

Современная экономическая наука ищет пути актуализации исследований для преодоления вызовов в условиях мирового финансового кризиса. Во время существующих проблем в частном де-регулируемом секторе, одна из эффективных инноваций может быть найдена в расширении ERP приложений на публичный сектор. Эта статья подходит к ERP приложениям более с экономической чем с технической перспективой. Сравнительный анализ Новозеландского публичного сектора поддерживается соответствующим международным практическим опытом (внедрениями), и основным фундаментальным анализом экономической сути бизнес-процессов, применяемых публичными субъектами. Ключевое преимущество (в историческом ракурсе) приходить от полной интеграции финансовой сферы применений с операционной деятельностью. Используя пример ERP (как одного из двигателей улучшения производительности и эффективности), эта статья направлена подчеркнуть как привнесем лучшую практику и технологии (управления данными и логической архитектуры) из частного сектора в публичную сферу.

Ключевые слова: ERP, публичный сектор, Новая Зеландия, продуктивность, финансовые внедрения, конфигурация.

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ECOLOGICAL ECONOMICS VS ECONOMIC(AL) ECOLOGY

Currently world faces the dilemma – ecological economy or economic(al) ecology. The researchers produce hundreds of surveys on the topic. However the analyses of recent most cited simulations had shown the diversity of results. Thus, for some states the Kuznets environmental curve has place, for others – no. Same could be said about different years for the same state. It provokes the necessity of drawing new group analyses to reveal the tendencies and relationships between economic and environmental factors. Most flexible and mirror factor of environmental sustainability is the volume of CO₂ emissions. The econometric analysis was used for detecting the economic impact on this indicator at the global level and in the spectra of group of states depending on their income. The hypothesis of the existence of environmental Kuznets curve for the analysed data is rejected. Real GDP per capita impact on carbon dioxide emissions is considered only at the global level. The impact of openness of the economy is weak. Rejection happened also to the hypothesis that for the developed countries there is a reverse dependence between the environmental pollution and economic openness. Indicator "energy consumption per capita" impacts on greenhouse gas emissions only in countries with high income. Whereby it should be noted that the more developed a country is, the more elastic is this influence. These results have a potential usage for environmental policy regulation and climate strategy.

Key words. Ecological economy, econometric modeling, environment, income, CO₂ emission.

Introduction. The ecologization of the economy and social consciousness is not entirely new problem. Practical realization of the ecological economics is closely associated primarily with state regulation of natural resources. New to this issue is the equivalent exchange between the state, the nature and humanity based on legal, organizational and technical solutions. This problem has been generated over two centuries and has assumed its critical importance, as there is an objective need for government intervention in the natural and environmental protection in order to achieve a balanced state.

Appearance in the scientific world the concept of "greening the economy" / "ecologization of the economy" has led to a substantial restructuring of existing notions about the nature conservation. Peak of these transition changes came in the second half of the XX century, when radically new ideas about emerging environmental hazards have developed. According to the ideas, the essence of the economic aspect of the Nature conservation has undergone changes. The concept of the greening of all aspects of human life has appeared.

Greening the economy caused by technological progress and its results, accompanied by the movement of the center of economic analysis of costs and outcomes in intermediate outcomes of economic activity and further projected trends. The main object of the strategy implementation for the greening economy and the main structural units of the economy should be the eco-economic system.

The main components of the ecologization of the economy (Fig. 1) can be seen in:

- the inclusion of environmental conditions, factors and objects, including resources usage among economic categories as equal with other categories of wealth assessment;
- formation of international and domestic environmental values and environmental factors;
- transition to a new pricing system that takes into account environmental factors, losses and risks;
- substantial expansion and refinement of payment for the nature usage;
- submission to the economy of natural resources and economic production of environmental constraints and the principle of sustainable environmental management;

- shifting the production to quality growth strategy based on technological upgrading at the ecological and economic control;
- rejection of costly approach to the environment that includes environmental features directly into the economy of production;
- rejection of the dictates of supply and artificial stimulation of optional secondary needs;
- reducing of the excessive range of products with increasing environmental quality control;
- the change and the ecological – economic orientation of the needs structure and welfare standards.

Analyzing the nature and the meaning of the term "greening/ecologization of the economy" [1], one can come to the following conclusions:

1) the term "greening/ecologization" is a result of the conversion of the term "ecology". It is a single-rooted, but is used in different senses. As it is well known, the term "ecology" in science was coined by the German naturalist Ernest Haeckel in 1866. Since then, for a long time arguing about the environment – until the second half of XX century – there were talking about greening.

2) the modern term "greening/ecologization" demonstrates a significant turnaround in the outlook of human and mankind in general. If earlier, before the term, the world is knowable in the materialization, geographization, biological function, then the offensive ecological crisis appeared because of intense human impact on the nature and the impending inability to regenerate the biosphere. Thus, there grown up a need to develop a new approach, called "ecological approach".

3) the actual category of "greening/ecologization" arose due to the fact that the notion of the nature and its protection could no longer contribute to the protection needs of the entire biosphere (Fig. 2).

4) from the perspective of representatives of environmental science, greening of the economy, in principle, can be subjected to all human society: science, consciousness, and thinking. But in any way to the use of the category of "greening/ecologization", its essence is in the implementation of ecological approach to people's lives to conducive the formation of a new worldview, according to which a human (and humanity in general) must weight its activities to how its actions are harmonized with the laws of nature.