

ECONOMIC PROCESSES IN PUBLIC SECTOR

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Abstract: The research team called LOST (Logistification and Standardization Techniques) has already started establishing the technical-mathematical models which can be applied for service processes. This research numbered BGF EMMI-2630-2/2013/TUDPOL will be carried out in the framework of the project called correcting service processes. In this study we would like to reveal mainly the processes of which support the logistical analysis of production flow can be developed. We can create the technological and mathematical model upon this analysis. The main approach was that we did not examine the elements of process, but we focused on the processes of the whole determined system and their relationship to each other, and we identified the flowing elements in the system. The purpose of our study is to identify the modules, processes and the related fluids and to we examine their flowing and transformations too. This is a multi-step process and as a consequence we form a methodology to examine the budgetary organizations' economic processes on system level.

Keywords: public sector, fluid flow process, public finance

1. Introduction

The production or logistical systems are easily analysable with the support of adequate modelling tools and can be found the critical spaces and nodes of bottlenecks. The application of this effective technical, mathematical model could be useful for examining other process systems. Based on our research the public finance process is likely to be modelled as a supply chain process. In this research we would like to map how it can be modelled as a logistic, a production-logistic or a supply chain process in technical aspect. If we can standardize this result, nothing will separate the logistic-like process from each other and the method will be the same. A public finance transaction can be regarded as a logistic process.

In the first view, materials flow in the processes like documents, assets, invoices, etc. The flow of information is significant and not only the information flow, but the data container, too. These data will be transformed, aggregated, stored or separated during a transaction. The process depends on nodes and time, so in this point of view it fulfils the definition of logistic process. The flow and usage of human resource are likely the same as in production process. Human resources perform transformations on data and information is similar as during a production process, because they are physically part of the entire process. The flow of energy and emission also can be found in a public finance process system.

We can see reason that the process system of our research corresponds to the definition of logistic. We have to reveal the internal features of the monitored system, after we should fit those to a logistic process, and in the end we can apply the technical-mathematical models of production logistic. In this case we can deliver successful optimizations in public finance processes with the support of target functions used in logistic. We start our examination with mapping the processes and upon the results we can observe the main nodes

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and functions.

Judgment of the Hungarian public sector organizations' operation is different in literature, but most authors agree on the fact that there are plentifully development opportunities [1]. The requirements and recommendations correspond to objectives of public administration reforms which are known as so-called New Public Management in most places. They are the following ones [2]:

- Simple and high-level decentralized organization, divided into divisions (high-level operation);
- Transparent, contractual relationships between the stakeholders instead of hierarchical, legal conditions (innovative approach);
- Application of organizational management tools and management techniques (required quality capacity);
- Emphasizing the operation which can be divided into processes and works as a project (effectiveness);
- Measurement of results, evaluation of quality objectives' fulfilment (successfulness).

Before detailed analysing budgetary management processes we need to make clear the more important related definitions. These are the followings [3]:

- *Fluid*: is such a tangible or intangible object which may flow between two not necessarily adjacent nodes of a system or may develop or parish (expire) on a node or may undergo a quantitative and/or qualitative transformation.
- *Node*: is such an object of a system which is able to store data on any kind of transformation of any element (e.g. input-output transformation)
- *Process*: is a batch of a fluid with its interconnections which is arbitrarily and/or intentionally treated as a single unit by a business organization.
- *Step*: e.g. budgeting (elements of the budget cycle)
- *Phase*: e.g. commitment (during the execution of the budget)
- *Module*: e.g. personal benefits (level below the steps)

Quotation from the Secretariat of the Hungarian Academy of Sciences' memorandum of association (point 8.) [6] is: "The Secretariat of the Hungarian Academy of Sciences (hereinafter: Secretariat) is legal personality, which owns independent budget, independent economy jurisdiction and responsibility. Secretariat of the Hungarian Academy of Sciences is expected to perform tasks related to management, accounting and data service, moreover operation and investment concerning property management and also the tasks involving usage, utilization, defence of property."

According to quotation mentioned above the Secretariat belongs to public sector authorities which works independently, as a result of this fact it performs public financial management's each function – as highest common multiple. The public finance organizations' outstanding economic processes can be modelled and the dynamic theoretical flow chart can be plotted by demonstrating the Secretariat. For this reason all the processes are not appeared on lower levels of state budget but they can be found by superior authorities.

In this present study we do not deal with the management activity's all processes because of length limits, so we disregard the introduction of modules/activities:

- housing loan,
- operation of motor vehicles,
- internal audit,
- and areas related to management (law and administration, communications, IT).

2. Logistics aspect of economic processes

The revenue of Secretariat is given by financial year's income which could be supplemented by previous years' not blocked reserves. The expenditures can have operational purposes or accumulation type. Beyond the identification of major economic processes (fluid flow), we denominate their regulatory basis and the input/output documents as well. The budgetary cycle including the steps of management (I-V.) is found in Figure I. The I/O connections and nodes can be seen on the figure where the fluid transformation takes place.

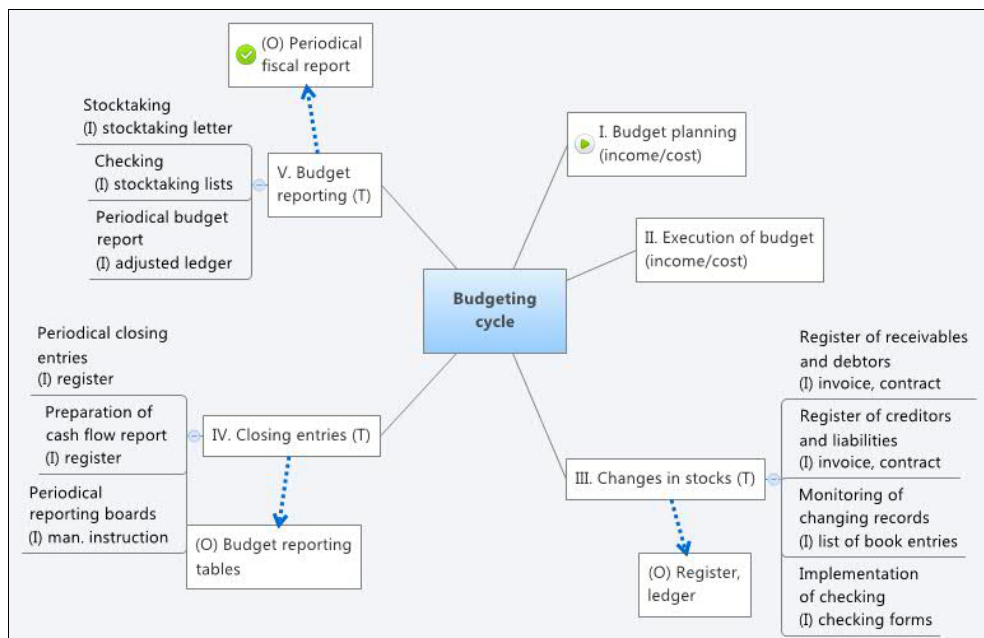


Figure 1. Steps of budgeting cycle (I: input ,O: output, T: transformation)

2.1. Budget planning. During the budget planning the following principles should be applied [5]:

- principle of budget based management,
- principle of programming,
- principle of completeness and detailed budget,
- principle of uniformity and transparency,
- principle of authenticity and aggregated cover.

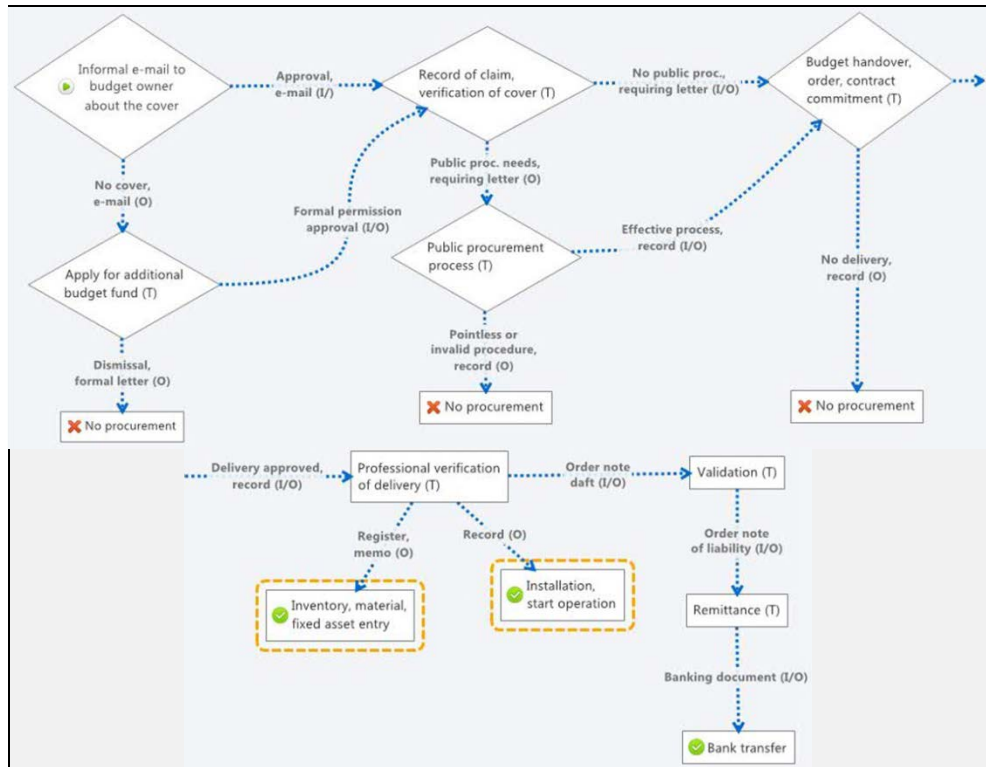


Figure 2. The budget planning is found in dynamic flow chart. The I/O connections and nodes can be seen on the figure where the fluid transformation takes place. (I: input, O: output, T: transformation)

Processes of budget planning step which were explored during the research (I = input; O = output):

- planning of operating income: Public Finance Act, Execution of State Budget, framework legislation of the sector (I: record of budget owner; O: documents of fundamental budget),
- determination of budget headcount limit: Public Finance Act, Execution of State Budget, Ministry for National Economy's guideline (I: record of claim announcement; O: report on allowed headcount),
- assessment of budget owner's claim: Public Finance Act, Execution of State Budget, Ministry for National Economy's guideline (I: record of claim announcement; O: requiring letter),
- budget planning: Public Finance Act, Execution of State Budget, Ministry for National Economy's guideline (I: requiring letter; O: budgetary documentation, textual amendment),
- budget planning by organizations of Hungarian Academy of Sciences: Management Regulation, Investment Policy planning circular, requiring letter (I: budgetary documentations, textual amendment),
- budgetary negotiation: Management Regulation, Investment Policy (I: budgetary documentation; O: record, memo, statement),

- approval of budget: Management Regulation, Investment Policy (I: record; O: Hungarian Academy of Sciences: Budget Act, Hungarian Academy of Sciences organizations: approval letter),
- drawing up of fundamental budget: Execution of State Budget (I: State Budget Act; O: documents of fundamental budget).

2.2. Execution of the budget. During the execution of the budget in every case the following four phases are occurred. These phases could not be separated itemized in each case in the process described from 1-7 points, because in given case inside a phase complex modules/processes can be appeared.

- a) *Commitment*: legal certification about intention of payment obligation related to assets registered as outside funds in statement of costs. Documents (paper based or electronically stored in CT-EcoStat integrated management system):
 - appointment document,
 - contract,
 - confirmed order,
 - Hungarian State Treasury agreement or other document based on legislation,
 - board decision or management policy.
- b) *Delivery*: the following aspects should be verified (amount and legitimate of the expenses') and the professional performance must be proved. Documents:
 - delivery note,
 - delivery certification,
 - order note.
- c) *Validation*: verification that undertaking of obligation is suitable for required financial order. Documents:
 - record from existence of cover and amount,
 - or it is happen by internal policies or direction.
- d) *Remittance*: disposition of the expenditure's fulfilment and the revenue's collection in writing
 - cash voucher,
 - order note of liability,
 - invoice,
 - certificate of invoice substitute.

Table I. methodize the following process (1-7) according to a) – d) points. From the table it can be determine that the partial processes related to informal drawing up and others are not separately concretize mostly. For this reason, in most cases these work as supplementary function.

2.2.1. Personal benefits. Processes of personal benefits' module which were explored during the research:

- regular personal benefits: Act on Legal Status of Public Servants, Labour Code, Public service regulation, Payroll Management Regulations, Hungarian State Treasury agreement (I: record of claim announcement, O: appointment document),
- bonus and honor: Act on Legal Status of Public Servants, Labor Code, Public service regulation, Payroll Management Regulations, Hungarian State Treasury

agreement (I: record of claim announcement, O: decision of chairman's meeting, notifications, organizations' lists),

- reimbursement: Management Regulations, Public Service Regulations, Act on Legal Status of Civil Servants, Act on Legal Status of Public Servants (I: request, O: permit, study contract, travel order, accounting documents),
- cafeteria: Public Service Regulations, Payroll Management Regulations, Hungarian State Treasury agreement (I: employee statement, O: summary table),
- social support: Public Service Regulations, Payroll Management Regulations, Hungarian State Treasury agreement (I: request, O: Decision of the Civil Service Rules),
- employees with contract of services: chairman direction about contract of services (I: record of claim announcement, O: legal department opinion, contract of services),
- employer payroll contribution: Tax and contribution laws, Hungarian State Treasury agreement (I: book).

Table I.

Execution of budget (summary table)

<i>Name of process</i>	(In)formal preparation	Commitment	Delivery	Validation	Ordering	Other
1) Personal benefits		1-7				
2 a-d) Standard material costs		1-3	4-5	6	6	
2 e) Purchase of stocks		1-3	4, 5.1	5.2	6	
3) Taxes, fees, contributions	1	1-3	4	5	5	
4) Investment, renewal		1-3	4-5	6	7	
5) Handover of liquid assets		1-2				
6) Public procurement	1-2	3-8				9-11
7) Income					1, 5	2- 4

2.2.2. *Standard material costs.* The processes of standard material costs' module which were explored during the research:

- announcement of claim, justification of financial cover: Management regulation (I: record of claim announcement, O: requiring letter),
- execution of necessarily procurement procedure: Public Procurement Act, Public Procurement Policy (I: requiring letter, O: Documentation of Public Procurement Regulation),
- draft order, completing the contract: Public Procurement Act, Public Procurement Policy (I: valid proposal order, contract),
- handover of operational budget: Management Regulation (I: requiring letter, O: permission letter),

- completion of delivery certification: Management Regulation, Asset Management Policy (I: record of fulfillment's fact, O: delivery certification),
- payment of invoice: Management Regulation (I: record of verification, O: invoice, order note).

The processes mentioned above correspond to the following list too. The difference can be found at point e), what we demonstrate join to list:

- a) Pretension of services (internal and external)
- b) Press and publishing activity
- c) International travel affairs
- d) Entertainment allowance
- e) Purchase of stock (added to point 5.2)

Figure 3 includes the figure of the standard material costs. The I/O connections and nodes can be seen on the figure where the fluid transformation takes place. The illustrated process' time frame is maximum 15 days (without delivery by third parties), which is determined by Organization and Operational Rules as administration duration.

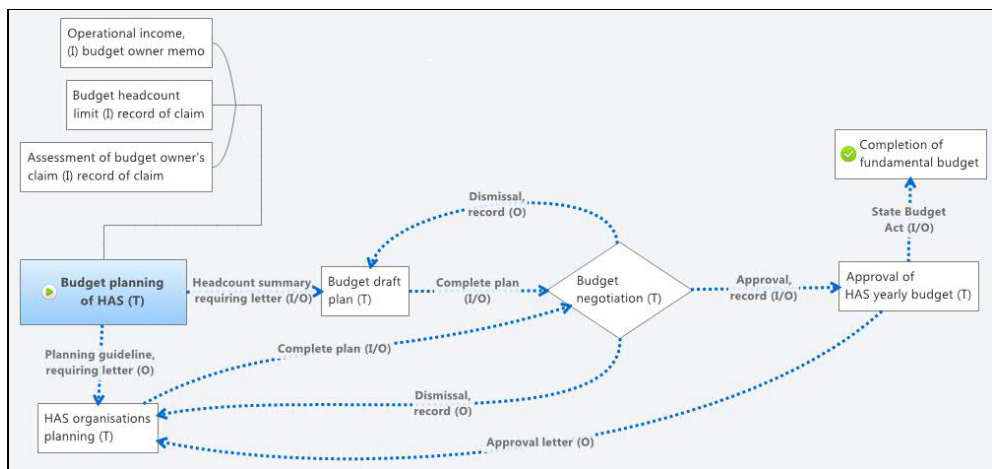


Figure 3. The standard material costs

2.2.3 Taxes, fees and payments. Processes of the taxes, fees and payments' module which were explored during the research:

- measuring the stakeholders, calculation of payment obligation, verification of cover: Management Regulation (I: record of claim announcement, O: measuring, book entry, requiring letter),
- execution of necessarily procurement procedure: Public Procurement Act, Public Procurement Policy (I: requiring letter, O: documentation of public procurement),
- draft order, completing the contract: Public Procurement Act, Public Procurement Policy O:valid proposal (I: order, contract),
- completion of delivery notification : Management Regulation, Asset Management Regulation (I: record of delivery's fact, O: delivery certification).

2.2.4. *Investment and renewal.* Processes of investment and renewal's module which were explored during the research:

- announcement of require, justification of financial cover: Management Regulation, Investment Policy (I: record of claim announcement, O: requiring letter),
- execution of necessarily procurement procedure: Public Procurement Act, Public Procurement Policy (I: requiring letter, O: Documentation of Public Procurement),
- draft order, completing the contract: Investment Policy, Public Procurement Regulation (I: valid proposal, O: order, contract),
- handover of investment/renewal budget: Management Regulation (I: requiring letter, O: permission letter),
- completion of delivery notification: Management Regulation, Asset Management Regulation, Investment Policy (I: record of delivery's fact, O: delivery certification),
- accounting of tangible assets: Asset Management Regulation, Investment Policy, Accountancy Policy (I: delivery certification, invoice Documentation of Asset Management Regulation and Investment Policy),
- payment of invoice: Management Regulation (I: record of verification, O: invoice, order note).

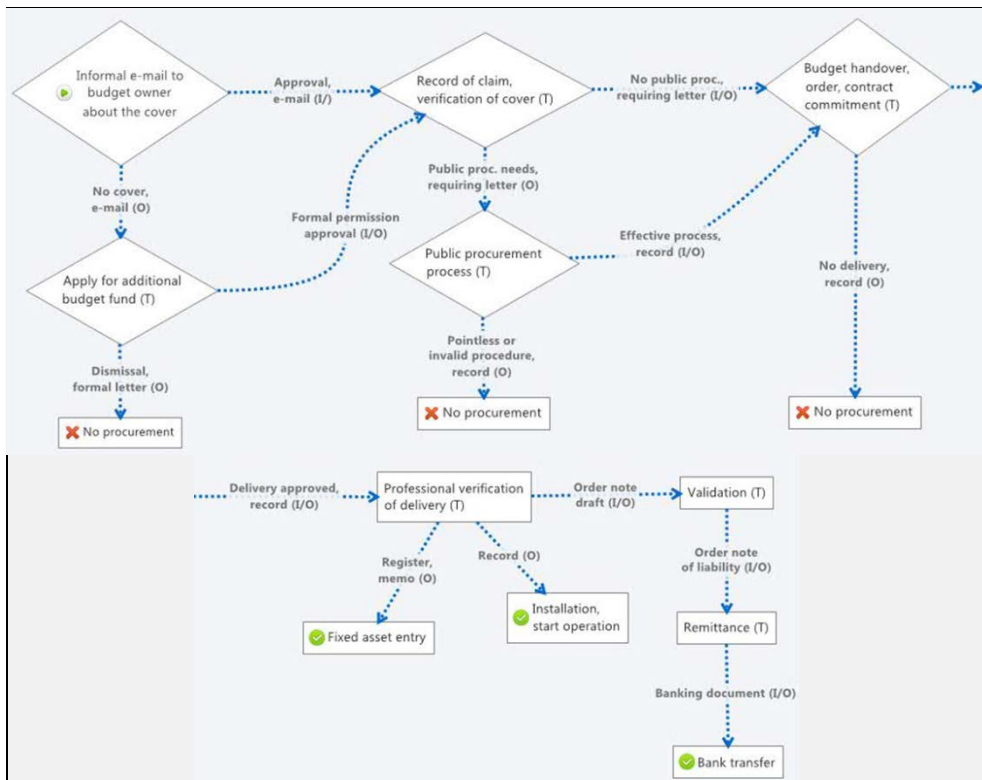


Figure 4. Process of investment and renewal (I: input, O: output, T: transformation)

2.2.5. *Handover of liquid assets.* Revealed processes:

- transferred financial instrument for operational purpose: Management Regulation, Public Service Regulations, agreement (I: requiring letter; O: agreement),
- transferred financial instrument for accumulation purpose Management Regulation, Investment Policy, agreement (I: requiring letter; O: agreement).

2.2.6. *Public procurements.* Processes of public procurement's module which were explored during the research:

- start of procedure: Public Procurement Act, Public Procurement Policy (I: requiring letter; O: starting letter, initiative document),
- draft of tender documentation, examination of conflict's interest, discussions: Public Procurement Act, Public Procurement Policy (I: initiative document; O: tender documentation, conflict of interest statement),
- publication of tender documentation: Public Procurement Act, Public Procurement Policy (I: tender documentation; O: announcement, order note),
- make tender documentation to available: Public Procurement Act, Public Procurement Policy (I: announcement; O: invoice, registration form from document receivers),
- receiving proposals and opening procedure: Public Procurement Act, Public Procurement Policy (I: registration form about document receivers; O: opening record of proposal),
- checking proposals: Public Procurement Act, Public Procurement Policy (I: opening record; O: reviewer committee record),
- decision proposal: Public Procurement Act, Public Procurement Policy (I: reviewer committee record; O: reviewer committee record),
- announcement of results: Public Procurement Act, Public Procurement Policy (I: reviewer committee record; O: reviewer committee record, summary about procedure's result),
- completion of the annual aggregated public procurement: Public Procurement Act (I: requiring letter; O: public procurement plan),
- making of preliminary aggregated handout: Public Procurement Act (I: public procurement plan; O: announcement, order note),
- drawing up of annual statistic summary: Public Procurement Act (I: analytical register; O: statistic summary).

2.2.7. *Revenues.* Processes of changes in stock which were explored during the research:

- transfer of budgetary support: Public Finance Act, Execution of State Budget, Management Regulation (I: application, O: financial schedule, record from transfer),
- operating income: Public Finance Act, Execution of State Budget, Management Regulation (I: contract, delivery verification, O: invoice, settlement),
- accumulation and capital income: Public Finance Act, Execution of State Budget, Management Regulation (I: agreement, O: certificate of invoice substitute, settlement),
- receipt of funds: Public Finance Act, Execution of State Budget, Management Regulation (I: agreement, O: certificate of invoice substitute),

- early financing: Public Finance Act, Execution of State Budget, Management Regulation (I: application with listed invoice statement, O: record from transfer).

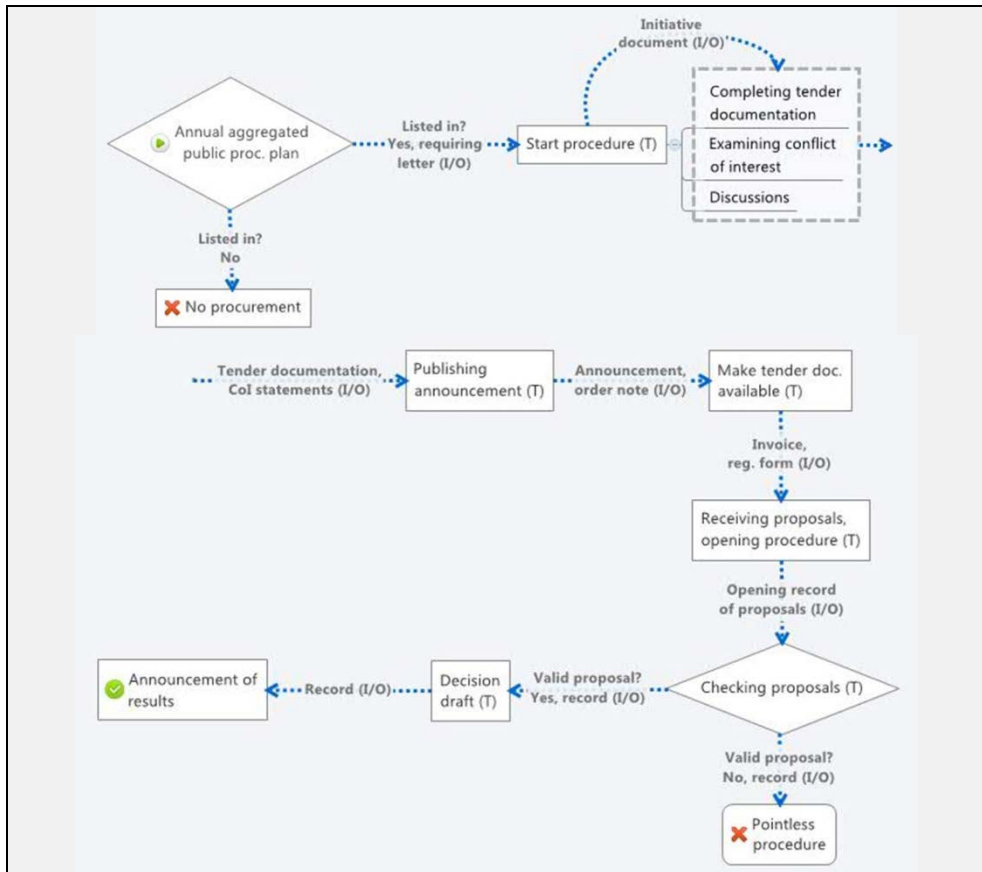


Figure 5. Process of public procurement (I: input ,O: output, T: transformation)

2.3. Changes in stock. Processes of changes in stock which was explored during the research:

- register of demands, debtors, and customers: Act on accounting, Accounting Policy, Assessment Regulation (I: certificate of invoice substitute, agreement, O: register of demand),
- register of creditors and liabilities: Act on accounting, Accounting Policy, Assessment Regulation (I: certificate of invoice substitute, agreement, O: register of commitment),
- monitoring of records' changes: Act on accounting, Accounting Policy (I: list of book entries, O: adjusted analytics),
- implementation of checking: Accounting Policy, Regulations (I: checking forms, O: adjusted ledger).

2.4. Closing entries. Processes of closing entries which were explored during the research:

- periodical closing entries: Act on accounting, Accounting Policy, System of accounts (I: register, checking tables, O: ledger statement),
- preparation of cash flow report: Act on accounting, Accounting Policy, System of accounts (I: register, O: cash flow report),
- preparation of periodical reporting boards: Accounting Policy, System of accounts (I: management instruction, O: data reporting boards).

2.5. Budget reporting. Processes of budget reporting which was explored during the research:

- stocktaking: Act on accounting, Stocktaking and Asset Management Regulation (I: stocktaking circular letter, O: stocktaking lists),
- fulfillment of checking: Accounting Policy, Regulations (I: stocktaking lists, O: checking forms, adjusted ledger),
- make out of the periodical fiscal report: Public Finance Act, Act on accounting, Execution of State Budget, Accounting Policy, Ministry for National Economy's guide (I: adjusted ledger, O: periodical fiscal report, textual amendment).

3. Summary

Judgment of the Hungarian public sector organizations' operation is different in literature, but most authors agree on the fact that there are plentifully development opportunities. The requirements and recommendations correspond to objectives of public administration reforms which are known as so-called New Public Management in most places.

In the scope of present study we demonstrate what could be an enlarging opportunity of the research direction. By exploring the economic process of the Secretariat of the Hungarian Academy of Sciences we could insight into the Hungarian public sector financial management processes. Due to the independent operating jurisdiction of the institution, the public sector's overall financial management flow chart could be plotted. The purpose of our study was to identify the modules and processes and the related fluids and to we examined their flowing and transformations too.

As a result of the research the process of the fluid exploration was introduced and identified the followings:

- nodes,
- fluids,
- fluid flows (dynamic I/O relations),
- transformations.

By the identification of the nodes it was possible to treat them as objects. After the exploration of the processes it is possible to start the perception-driven researches using questionnaires and deep interviews. Later on it can be extended to entropy-level research.

4. Conclusions

The steps of the economic processes of public finance organizations, the appearing phases and the explored processes constitute a unified system. In many cases the operation of the system is not suitable, because the processes do not reflect the flow of information, documents, etc. flowing in the process. We started the researches with the explored processes' general attributes identification, then for this we built the definitions and attributes of the object-flows.

According to the explored processes and fluids the perceptual analysis of the nodal human resources can be established - can be established a perception-scale too - as a consequence the process improvement can be carried out. Another option for the process improvement could be the change of transformation in the node. By the modifying of the perceptual sensitive human resource and the not enough effectively transformation the public sector economic processes can be improved (within the legal limits) and minimize the error rate.

According to the study's purpose we examined the steps of the budgetary management, the processes and the identification of the related fluids, their flows and transformations too. This is the first phase of the multi-step process as consequence we form a methodology for the system-level examination of the budgetary management processes. From this methodology a customized method can be create for the further tested public sector institution.

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