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Abstract
In this study we report on the benefits achieved from enterprise systems implementations. Building on the existing research this paper uses the expectation-benefits framework as an analytical lens to identify and understand realised benefits. The study comprises 14 empirical case studies that focus on projects to extend existing ERP and CRM implementations. The work serves two key objectives. First to gain greater insights into the range and scope of realised benefits and second to further validate the exp-ben framework. Benefits are identifed in all four areas of the exp-ben framework. Most notable is the continued focus on achieving integration and in the improvement of information quality and better business intelligence.

Keywords: ERP, CRM, benefits realisation, enterprise system, benefits framework

1 Introduction

This paper presents the findings of a study that examines the benefits that organisations are realising from the implementation and use of Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) systems. These types of enterprise system represent a specific class of information system used to integrate and support intra- and inter-organisational business processes. The term ERP system is now typically used in a broad sense to describe integrated systems covering all the basic business processes of a company. The core of the system is usually the accounting module, which provides general ledger and bookkeeping capabilities. Other modules include sales, procurement, marketing, human resources and warehouse management. CRM systems focus specifically on processes at the customer interface. They normally comprise of modules for contact management, communication (mailings), marketing, contracts, call centre and so forth. Most large companies have integration interfaces between ERP and CRM systems for the exchange of customer and sales data. In recent

years there has been a blurring of the distinctions between ERP and CRM systems. Most ERP systems have expanded to also include basic functionality for CRM and Management Information Systems (MIS). Similarly, CRM systems now include much general ERP functionality.

The work presented here is part of a long-term research programme into benefits identification and benefits realisation. To date the study has focused on the drivers and motivations for implementing enterprise systems. The outcome of this work was the development of the exp-ben framework, a rich, heterogeneous classification of the expected, realised and unintended benefits arising from enterprise systems implementation projects (Schubert and Williams 2009b, Williams and Schubert 2009). The aim of the research is to provide a comprehensive, heterogeneous, empirically derived classification of the drivers and benefits of ERP systems implementations and to extend existing work by:

- deriving an extended classification to track benefits in context and over time
- providing insights into the range and complexity of motivations and a framework for mapping and discussing the ERP motivations and benefits in the context of individual implementations
- identifying and (where they exist) describing and explaining variations within and between organisations, for example in organisations: in different industries; of different size; in different stages of maturity; and with different project motivations and goals.

Our aim in this paper is to further develop this work by identifying and classifying the benefits realised from recent ERP and CRM implementation projects. The work serves two key objectives. First to gain greater insights into the range and scope of realised benefits and second to further validate the exp-ben framework.

Thus, in this paper our interest turns to understanding more fully the benefits that organisations are achieving from their enterprise systems implementations. The focus is specifically on projects that are dedicated to upgrading and/or extending existing ERP/CRM systems. Based on interviews with the managers of ERP and CRM implementation projects our study develops and presents the findings from empirical case studies in 14 companies. The focus on realised benefits is expressed through the study's overarching research question.

> *What benefits are companies actually realising from their current ERP and CRM implementation projects?*

The paper is organised as follows. Section two provides the background and context for the research. We provide a brief summary of the relevant literature and the development of the research question. This is then followed by discussion of the research approach, our research design and the methods used for data reduction and data analysis. The main part of the paper comprises the presentation of the case study data and findings. The final sections provide a discussion of the key findings and the implications for future studies.

2 Background and literature

Identifying the benefits derived from information systems implementations has been the focus of scholarly research interest over many years (Legare 2002, Shang & Seddon 2002, Staehr et al 2002, Holsapple & Sena 2005, Staehr 2007). However whilst there has been some progress in understanding, these studies continue to identify that organizations do not always achieve the benefits they desire from their investments.

Recent practitioner reports and surveys also conclude that identifying and realising the benefits of enterprise systems implementations remains a challenge (CSC 2008; McDonald 2009). Achieving the expected benefits from IT investments ranked as the second most critical issue overall for organisations of all sizes (McDonald 2009:14) and return on IT investments remains an issue with 43 % of respondents reporting low, negative or unknown returns (McDonald 2009:17).

A review of the research literature on enterprise systems benefits was conducted to understand where previous research effort has been focused and to identify any limitations to this focus, especially with respect to its applicability to the imperatives of practice in the 2010's (reported in Schubert and Williams 2009a, 2009b). Relevant to this paper are the following findings. Prior studies include little insight into, or distinction between variations in the *motivations* for undertaking an enterprise systems project and how these different motivations shape the identification of benefits. Nor do they provide detailed insights into the *timing and nature of benefits*. For example, is the benefit desired/expected and identified at the outset of the project; is it an emergent or an unanticipated benefit that arises during the project; or is it one that is realised (or not) as a project outcome? Changes in the benefits profile over the course of a project is also largely unrecognised in existing studies. Implementation projects vary in *reach and scope;* from those focused into one functional area to those covering multiple functional areas or spanning multiple organisational boundaries. Finally, existing research pays little attention to the *locus of the benefit* and to whom the benefit applies.

In the previous stages of our research programme we addressed some of these limitations through the development of a more extensive and comprehensive framework for classifying and understanding enterprise systems benefits. The exp-ben framework is derived from over 80 case studies of enterprise systems implementations (see Williams and Schubert 2010 for details of the framework).

The majority of prior research is based on studies of implementations undertaken between the late 1990's and 2005. Since then both the business and the software environments have changed significantly. Recent surveys of information systems and technology issues for senior executives identify that a main priority for organisations is the further implementation of enterprise systems to drive business improvement (CSC 2008, McDonald 2009). Whereas earlier implementations focused upon technical integration and achieving efficiencies to reduce the total cost of ownership it is now recognised that attention has turned to the return on investments and maximising business benefits (Jutras 2009). In terms of the technology landscape there is increasingly convergence between ERP and CRM software. A recent report identifies that "ERP and CRM solutions are becoming more closely intertwined in order to satisfy the growing informational needs of more constituents within the organization" (Aberdeen 2010). Further, the software architecture landscape is being transformed by the growth in software as a service

(SaaS) and of service-oriented architectures (SOA). These changes all present new challenges, particularly in the areas of integrated business design and the identification and management of enterprise systems benefits.

Put simply, in an environment of business and technical change, organisations continue to struggle to identify the benefits they are obtaining from enterprise systems implementations. It is against this background and context that we focus our attention on the benefits being realised from current enterprise systems implementations.

3 Research approach and research design

In this study we adopt a case based approach to investigate the *benefits* companies are actually *realising* from their *current* ERP and CRM implementation projects. To assist in answering our research question we developed 14 case studies of enterprise systems implementations. The cases are written in a common structure following the experience methodology (Schubert and Wölfle 2007).

3.1 Data collection and data reduction

Interviews were conducted with the managers responsible for the implementation of ERP/CRM projects in each company. The interview questions elicited information about the company and the motivations for the project under investigation. Specific attention was given to the outcomes of the project and the benefits that had been realised to date. The interviews were transcribed and the 14 cases prepared.

An analysis and coding of the text of each of the cases was performed in order to identify and classify the benefits realised. The exp-ben framework was applied as an analytical tool to assist us in data reduction and coding. The framework was developed to identify and classify the types of benefits expected and/or realised by organisations. The exp-ben framework is structured to represent and track benefits across the full project lifecycle from business case (desired benefits) through to in-use (realised benefits).

Each benefit is classified and given a field code using a method of inductive coding. Each code consists of three dimensions: (1) the area (e.g. business design), (2) the corresponding element (e.g. a process), and (3) the concrete measurable criterion (e.g. pace). Details about how the exp-ben framework was constructed are reported in (Schubert and Williams 2009a).

Benefits are classified into four areas or categories. These categories were derived from an in-depth analysis and coding of benefits arising from more than 80 empirical case studies. At the top level the four main areas are: *business design*, *management*, *functional areas* and *IT & infrastructure (*cf. Table 1). To complete the data analysis and reduction we compiled a table comprising the realised benefits grouped by the above four categories from the exp-ben framework. This then allowed us to perform a comparative analysis of realised benefits.

Area	Description
Business Design *(strategy/ processes)*	*Includes the strategic direction of the company and its operational organisation. The codes in this area, describing benefits relating to improvements in the strategic objectives and in the processes (processes and workflows) of the company.*
Management *(resources)*	*Includes improvements in access to, and the use of company resources. Dominant here is the improved access to information. But benefits impacting on the levels of employees, product design and cost aspects (finance) fall into this area.*
Functional Areas *(functions)*	*Includes the elements of the organisation's value chain. Here benefits focus on the modules and functions of an ERP system. They are generally oriented towards the support of individual functional areas (departments) in the company. The potential benefits in this area arise both from internal improvements as well as across organisations by optimising the customer and supplier relationships.*
Information technology & infrastructure *(technology elements)*	*Focuses on impact in the field of "e". This is about the optimisation of inter- and intra-organisational technological components, such as applications, databases and networks. An often-realised benefit is the integration of heterogeneous databases, and thus achieving the uniform view of enterprise data.*

Table 1: Four areas identified in the exp-ben framework

3.2 Overview of case studies

Table 2 provides an overview of the companies and their industry sectors. The selected cases contain detailed information about a specific implementation project. The cases all represent projects that are providing extensions to an existing ERP or CRM system or the integration of a software service to support a new business need. In all the cases the original ERP/CRM implementation has been in place for several years and these projects represent current endeavours to leverage greater capability or to expand the functionality of these existing systems.

Group A: Customer facing ERP systems projects				
Case site	**Industry/Products**	**Supply Chain Level**	**Type**	**Processes**
Weiss+ Appetito (CH)	Building industry	Construction works and services	B2B/ B2C/ B2A	Quotations
ENGEL (CH)	Steel, building services and hardware	Trade and services	B2B	Warehouse management
Variosystems (CH)	Complete solutions for electronics	Development, production and testing	B2B	Disposition and manufacturing
eltromat (D)	Systems for measuring and propulsion (print products)	Development, production, integration and maintenance	B2B	Quotations
ad AUGROS (D)	Car parts and accessories	Trade	B2B	Order entry
Blizzard (AT)	Sports equipment (ski)	Manufacturing	B2B	Re-orders
Finzelberg (D)	Phytopharmaceutical active ingredients for pharmaceutical products	Manufacturing	B2B	Production and approval
Group B: Supplier facing ERP systems projects				

Case site	Industry/Products	Supply Chain Level	Type	Processes
UBS (CH)	Financial services	Services provider	B2B/ B2C	Order processing indirect goods (Purchase-to-Pay)
Schindler (CH)	Transport (elevators and escalators)	Manufacturing	B2B	Order processing components and transports (Purchase-to-Pay)
Group C: Projects extending ERP systems to web				
Case site	**Industry/Products**	**Supply Chain Level**	**Type**	**Processes**
LeShop (CH)	Food retailing	Retail	B2C	Assembly part order
Digitec (CH)	Information technology and consumer electronics	Retail	B2C/ (B2B)	Order processing B2C
Group D: Customer relationship management systems projects				
Case site	**Industry/Products**	**Supply Chain Level**	**Type**	**Processes**
HERWE (D)	Cosmetic products and oleochemical raw materials	Trading and manufacturing	B2B	Contact management
INTEC (D)	IT consulting and assembly	Consultancy and system vendor	B2B	Quotations
BSCC (CH)	Chamber of commerce	Services	B2B	Lead Management: creating new members

Table 2: Overview of companies (with country code), industry and focussed process

The companies cover a broad range of size, industry and products. The sample ranges from very small companies such as INTEC to multi-billion enterprises such as the Swiss bank UBS. The cases comprise different industries and represent companies on different levels of the supply chain (manufacturing, services, and trade). The companies are all from the three German-speaking countries Germany, Austria and Switzerland.

Whilst the cases all represent current activity they have different focus on ERP and CRM; we have divided them into four groups for analysis purposes.

Group A comprises seven cases that describe projects focusing on the customer facing aspects of their ERP implementation. The processes under examination are all primary processes covering a wide spectrum of business activities on the sell-side and in manufacturing. Four case studies have their focus in the area of the generation of a quotation or order entry/re-orders. Another case looks at the internal shift of goods in the warehouse, a logistical process between different sites of this company. The last two cases describe the actual manufacturing process.

Group B contains two cases on the supply-side. Two case studies look at the purchase-to-pay process in large firms (UBS and Schindler). Here, the optimisation of the ordering process is shown (from the order to the receipt of an invoice) in the form of a seamless exchange of electronic business documents between the involved business partners.

Group C contains two case studies that focus on extending the existing ERP system to the web to provide *e-commerce* functionality. The projects focus on improving the demanding requirements regarding back-end processes (order fulfilment).

Group D contains three cases that focus on customer relationship management and extending the use of CRM systems. These cases focus on improving contact and customer data as well as the subsequent preparation of quotations.

4 Analysis and discussion of findings

Table 3 captures the most important benefits that resulted from each project ignify ttation as defined by the interview respondents and grouped according to the four categories in the exp-ben framework. In the following sections the benefit types identified in the cases are analysed and compared.

4.1 Case analysis

	BUSINESS DESIGN Strategy/Processes	MANAGEMENT Resources	FUNCTIONAL AREA Functions	IT & INFRASTRUCTURE Technology Elements
Weiss+ Appetito	Faster processes (e.g. customer quotations, final accounts, material and equipment dispositions) Group-wide reporting Increased transparency	Massive relief for employees in daily business Higher satisfaction and motivation at work All information is centrally stored without redundancies and available for all subsidiaries	Consistent target-actual comparison over the entire life cycle of a project (construction site) Timely construction cost controlling Key Performance Indicators (KPI) for each project	Integration of functional modules is optimized for information delivery Higher security and availability levels by hardware outsourcing
ENGEL	Massive acceleration of the processes (e.g. month-end closing 23 days earlier)	Improved inventory management leads to higher stock availability and lower capital lockup. Daily on-line analysis of the situation possible	New warehouse management allows a larger assortment	Through processing reduces error rates ignifycantly Continuous coverage of the processes in the system
Vario-systems	Harmonization of business processes across all locations High process stability and success in inventory management Increased transparency and performance Quick adaptability to changing circumstances	Positive mood and calm working atmosphere Higher reliability of the KPIs Complete view of customers' orders Savings achieved	Pooling purchasing volumes results in better purchase prices and optimized scheduling Management cockpit (ad-hoc analysis)	
eltromat	Controlling process and responsiveness greatly improved Stringent implementation of the internal process structure Error rate and process time significantly reduced through transparent tracking	Accurate and timely information to support decision making for the management Quality of data increased Costs (in the form of bound material) and reduced storage capacity Human resources freed up	Precise daily evaluations of real-time data, specifically (1) accurate liquidity forecasts and (2) detailed planning and cost centre accounting	Integrated ERP solution with a central database
ad AUGROS	Increased process transparency Improved competitiveness through faster processes Implementing just-in-time delivery Attractive prices	Reducing costs through more efficient and faster processing Time savings for employees through automation, thereby improving customer service	Generation of analysis and reports for corporate management Increased customer satisfaction with faster order processing	Guaranteed future due to up-to-dateness of software and hardware Technical integration with suppliers
Blizzard	More transparency in the processes Employees recognize opportunities for improvements and realize them with the software	Ad hoc availability of forecasts and stock Motivated employees	Better ability for sales department to provide information (e.g. about product availability)	Separation of heterogeneous island solutions through an integrated ERP solution

	BUSINESS DESIGN Strategy/Processes	MANAGEMENT Resources	FUNCTIONAL AREA Functions	IT & INFRASTRUCTURE Technology Elements
Finzelberg	Shorter process times by automating (e.g. ignifying, incoming invoice) Error prevention in processes	Common and faster access to key information Collaborative work	Workflow definitions Linked, archived documents Display of process status Automatically generated task list	Continuous coverage of the processes in only one central standard software solution
UBS	Process cost savings through electronic processes Outsourcing of functions to specialized IT service provider		Generation and assessment of possible KPIs	Standardization and clear definition of technical interfaces
Schindler	Process is timely, faster, more efficient and transparent Increased costs transparency Reduced dependence on carriers Standardization leads to process optimization	Manual coordinative activities eliminated Higher data quality	Monitoring contracts, purchase orders and shipments with key figures Scheduling and cost optimization possible	Replacement of a self-developed logistics tool
LeShop	E-shop (i.e. the software itself) is part of the business concept Continuous improvement through the collection of performance indicators High degree of automation	Employee motivation (performance indicators at individual and team level are rewarded with bonus payments) Meaningful customer information to optimize product range and customer communications	Operational performance through software support (e.g. cross-docking) Automated control of contract logistics and invoicing	Individual software is ideally tailored to the requirements Integration interfaces with partners (Migros, Swiss Post)
Digitec	E-Shop is the crucial sales channel High flexibility in the implementation of changes (agility) High process efficiency Continuous efficiency improvement		Improved communication and coordination Workflows increase the level of automation	Bespoke software ideally fulfils the requirements Programming software is core competence
HERWE	Strategy “one face to the customer” realized Customer acquisition process greatly improves	Central, shared access to customer profiles High data quality (e.g. increased validity of customer profiles)	Ad hoc reports and analysis possible PIM: transparency in workflows and tasks Control tool (management by objectives)	Integration of ERP and CRM system
INTEC	More transparency in the entire business Increased efficiency in customer service Responsiveness ignifycantly increased Measurable increase in customer satisfaction	Valuable time savings through reduction of the search effort Better access to information: documents, reports, and customer history Focus on customer processes realized	Seamless communication Faster generation of quotations Follow-up functions with escalation management	Streamlining of the entire IT landscape
BSCC	Portfolio of applications is fit for future requirements (agility)	Reduction of costs (elimination of the paper directory, one full-time position) Higher quality data		Software as a Service (Saas): highly scalable infrastructure at low cost

Table 3: Benefits identified in the cases grouped by the categories in the exp-ben model

The comparative analysis makes it possible to identify recurring themes and patterns. It is noticeable that some of the benefits identified occur in several cases, which is a possible indication that these are the typical benefits generated from the use of ERP and CRM systems. These typical benefits are discussed in the following sections.

The interview respondents have identified the main benefits as being in the areas of Business Design (strategy and processes) and Management (resources). Benefits in the field of Information Technology & Infrastructure are least likely to be mentioned.

There are no remarkable differences between large and small companies, or between different industries. Outsourcing of IT-services can for example be seen as beneficial by both the large UBS (platform for exchange of documents) as well as the British-Swiss Chamber of Commerce (Software-as-a-Service) – even if the financial volume of the two companies differ significantly.

Strategy and Processes

At the level of Business Design there are four themes that attract attention and are mentioned in several case studies:

- Strategy: quick adaptability (agility)
- Strategy: realisation of parts of the business model (e.g. just-in-time, multi-channel with e-shop) with the help of the software
- Processes: faster processes
- Processes: increased transparency

The importance of agility is emphasised in multiple cases. Variosystems as an example identify the possibility for fast adaptability to changing conditions as an important outcome of their ERP system implementation. The BSCC sees the flexibility of the newly established application environment as a major advantage of their established SaaS solution. Some of the companies are using software specifically to realise a part of their business model. These are not only the two pure e-commerce companies LeShop and Digitec. ad Augros was able to guarantee just-in-time deliveries efficiently only after the introduction of the new version of their ERP system.

In the area of *processes* "acceleration" and "transparency" are frequently mentioned. Weiss + Appetito accelerated, for example, the preparation of customer quotations, final accounts, as well as material and machine dispositions. ENGEL observed a massive acceleration in speed of their processes. The month-end accounting can now be done 23 days earlier. At Variosystems both the transparency and the performance of the processes has been increased. Similar statements are found for ad Augros, Blizzard, Finzelberg and Schindler. The sheer frequency of nominations shows that both the control and the rapid execution of processes are important benefits arising from the use of ERP and CRM systems.

Resources

For the area of resources we identified the following recurring benefits:

- Information: availability of information (central, non-redundant, up to date)
- Information: improved data quality

- Finance: cost and time savings
- Employees: higher satisfaction and motivation

As expected, improved access to information is the main improvement mentioned in the cases. The source of the benefits is often the central repository, which enables the joint use of non-redundant data. In addition, the cases reflect the perception of an improved *information quality*.

At Weiss + Appetito all information is centrally available for all subsidiaries. eltromat has access to accurate and current information to assist in the decision making process for management. The data quality is particularly praised in this case. Finzelberg emphasizes the importance of shared access to central databases. Even in the large company Schindler the improved data quality is a crucial beneficial aspect. Similar statements regarding "*information*" can be found in almost every of the 14 cases, which is not surprising because the "processing of information" is a central function of ERP and CRM software.

Benefits can also be identified in the *financial* area. ENGEL and eltromat speak of a decreased capital lockup; ad Augros has lower costs due to faster order processing.

There are also advantages for the *employees*. The staff at INTEC saved valuable time with the help of a reduced search effort. LeShop increased employee motivation with bonus payments based on newly measurable KPIs. Blizzard identifies motivated employees as a result of the efficient software support in their daily business processes.

Functions (ERP Modules)

The benefits in functional areas of the company (departments) mainly include:

- Business intelligence (key figures)
- Improvements in the sales department
- Increased customer satisfaction
- Increased level of automation through workflows

On the *functional level* benefits in the form of improved business intelligence are clearly in the foreground. The generation of analyses and reports for corporate management, e.g. key performance indicators (KPI), management cockpit (ad-hoc analyses) or the monitoring of contracts, purchase orders and shipments are mentioned here. Almost all companies state that they obtain a great benefit from the extraction of performance figures.

Variosystem and HERWE praise their management cockpits, which today allow them to access ad hoc analyses. eltromat benefits from more precise daily reports such as, for example, accurate cash forecasts and detailed cost centre planning and accounting. Weiss + Appetito is now able to perform a target-actual comparison over the entire life cycle of a project (construction site).

Sales and delivery is the department that realises the most improvements. Benefits identified include, for example, improved ability to provide fulfilment and logistics information (Blizzard), a possible extension of the assortment (ENGEL) or higher operating performance (e.g. the cross-docking process of LeShop).

Ad Augros increased *customer satisfaction* through faster order processing. Finzelberg, Digitec and HERWE benefit from implemented workflows (increased degree of automation; transparency of the scheduled tasks).

Technology Components

In the field of information technology, the following three themes are most significant:

- Integration of data and software systems, or functional modules
- Integration interfaces with partners
- Outsourcing of hardware and software

Integration was mentioned in almost every case. Integration reflects another central effect of business software: the unification of different functional areas in a single database and an integrated software solution.

At Weiss + Appetito the integration of functional modules led to enhanced information delivery. ENGEL could significantly reduce its error rate. Integration also leads to the realization of benefits across corporate boundaries. Ad Augros, Schindler and LeShop benefit from integration interfaces with partners that lead to process improvements.

Different forms of *outsourcing* lead to benefits in the analysed companies. As mentioned above, both small and large enterprises realised benefits from the outsourcing of IT services. UBS and Schindler use service providers for their electronic document exchange. BSCC is very satisfied with a lean SaaS solution for CRM processes.

5 Concluding remarks

In this paper we examine the benefits arising from ERP and CRM systems implementations. The work builds on earlier research in two ways. First it presents the benefits being realised in recent implementations providing an up to date picture. Second it focuses attention on implementation projects to significantly extend or enhance an earlier ERP or CRM system implementation. Previous research has largely focused on new systems implementations or version upgrades. This study enables us to gain insights into the ways an existing system is extended and the benefits arising from this activity.

The exp-ben framework provided a useful analytical tool to help us map and understand these benefits. Our findings above indicate that in almost all the cases companies were seeking to obtain benefits in multiple areas of business design, management, functional areas and technology. Benefits were achieved across all levels in particular those relating to integration. This leads us to conclude that future work in the area of benefits realisation should be framed in terms of understanding the benefits portfolio. The exp-ben framework also provided a useful tool for communicating our findings to the case study participants. In particular it helps them to map their own benefits and start to understand their benefits profile.

Interestingly one of the benefits most frequently desired and obtained is the generation of better quality information and business intelligence. This is significant as earlier work on initial ERP and CRM software implementations also sought to achieve this. We can conclude that either the original systems failed to deliver adequate functionality regarding information quality. Or more likely, particularly with respect to business intelligence requirements have changed over time, requiring new types of intelligence and reporting. This was certainly evident in the cases reported here.

Two areas for further work were identified through our analysis. First more attention needs to be paid to the locus of benefits. That is, to understand who is the beneficiary. In most of the cases in this study the projects were enhancing systems and services at the customer and supplier interfaces. Further work is required to understand how far these benefits extend to customers and suppliers. Second, work is required to understand the benefits arising from the integration of SaaS and web services to existing ERP and CRM systems. This work could also be extended to investigate the benefits being sought from third generation ERP systems (www.3gERP.org) where more agile systems architectures are being planned.

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